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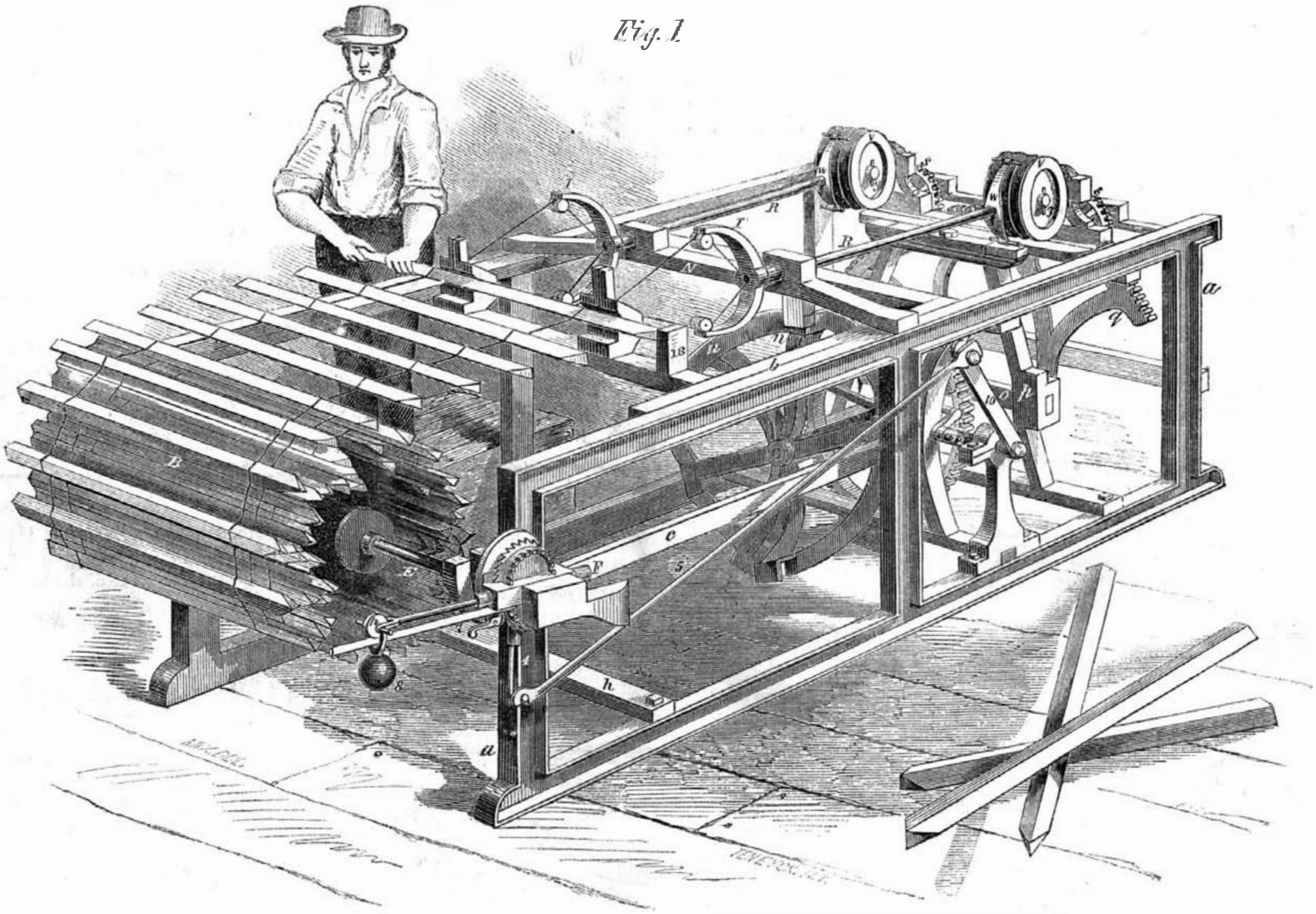
MACHINE FOR MANUFACTURING PICKET FENCES.

The annual expenditure for fencing in our extended country is vast, amounting to a greater sum probably than many persons would estimate. Timber is the material that is most extensively employed for such purposes, and various are the forms in which it is arranged to suit the taste, the place, and purse of the owner, but perhaps none is so universally used as the picket fence.

The machinery is supported in the fixed frame, *a*. The small sliding frame, *b*, is for feeding the pickets between the guide jaws, 18. These guides are moved alternately back and forth the exact distance required between each pair of pickets, and this space can be varied from two to five inches; *v v* are double wire reels situated on the spindles, R R. The wires pass through an eye in the neck of each spindle, which is tubular; thence they are carried through the eyes of the flyers, I I, into to produce the twisting action of the wires. The space between the guide cheeks, *j j*, allows for the interval of rest to the flyers for the insertion of each picket.

The small feed sliding frame, *b*, with the guides, 18, receives its intermittent back-and-forth movement by a peculiar cam wheel, *u*. It has a scolloped waved ring upon it, and a small roller on the back end of a rack-bar of the slide frame, *b*, is moved back and forth by the scolloped edge of this cam wheel, so as to feed the



MOORE & KELLY'S MACHINE FOR MANUFACTURING PICKET FENCES.

The accompanying engravings illustrate a most ingenious machine for weaving pickets with wire ties into entire webs of fence, so that they may be manufactured in any lumber region, and transported to the place where they are to be used, or to a market for sale or shipment, in the latter case making wooden fencing to become a new article of commerce.

Fig. 1 is a perspective view of the machine, and Fig. 2 is a back end view. Two lines of wire, at suitable distances apart, are employed to bind and secure the pickets, and each line has two strands. The pickets are fed in between guide jaws by the attendant as shown, each strip between four wires, and these are twisted first to the right in advance of a picket, then to the left behind a picket, so as to hold it securely in place. As each picket is twisted between the wires, it is carried forward around the take-up beam, B, which is similar in nature to that of a power loom. We will now describe the construction and operation of the machine, which, although complex, may be comprehended by any attentive reader.

slits in the jaws of the guides, 18. The back ends of the spindles, R, have pinions, *t*, Fig. 2, upon them; these gear into wheels, *s s*, which have pinions, *r r*, upon the ends of their shafts. A sector wheel, *y*, has its vibrating shaft at the foot of the frame. This sector gives first the right and then the reverse twist to the wires on the flyers to bind the pickets. It has an intermittent stationary motion, so as to allow for the action of the feed guides, and the space which each picket occupies in the web. This sector rotates the spindles of the flyers through the pinions and gearing shown in Fig. 2. On the shaft of the driving pulley, 30, there is a pinion gearing into the wheel, *w*, on a central horizontal shaft, *i*, on the inner end of which is the cam wheel, *u*. On the other end of this shaft is an eccentric, *m*, which, as it revolves, presses first on one side, then on the other, against a yoke frame, *n p o*, which is thus traversed back and forth. This yoke has a pin in its lower side that takes into guide cheeks, *j j*, on the lower end of the sector wheel, and by the motion of this pin the sector is thus made to move back and forth from one side to the other

pickets. In Fig. 1 the rack-bar is omitted, as it would have covered this cam wheel, but its office will be understood.

On the inner face of the wheel, *u*, are two pins, situated at equal distances apart, which, as they move round alternately, vibrate the arm, 10, Fig. 1, which gives motion to the connecting rod, 5. In this manner the arm 4, and a pawl that takes into the ratchet wheel, *n*, on the shaft, E, are operated, as the take-up motion of the picket beam, B. The shaft of this beam is also weighted to keep the wire taut and the web of pickets in proper tension. The weight, 8, is secured on a lever, 7, and is also attached on a screw spindle connected to a sliding pulley, *h*. This rod has a screw, F, upon its inner end working through a nut, whereby the weight is gradually advanced from the inner to the outer end of the lever as the web of pickets, B, increases in diameter. This is a peculiar and ingenious take-up motion, and seems to be as applicable to cloth power-looms as to this picket fence machine.

The beam or roll of pickets, B, is elevated and lower-ed by the lever wheel, L, which turns a shaft, 2 , Fig. 2, thus moving the swing frame, C, on which it is placed. This operation maintains the top tier of pickets, as they are woven, on a line with the twisting flyers of the wires.

A large machine of this character, capable of turning out 248 feet of fence per hour and requiring the attendance of only one person, has been in successful operation for some time. But little power is required to drive the machine, and pickets of any thickness and length can be woven in it. It seems to us that it is just such an invention as has long been sought after, for making cheap fencing for the western sections of our country, where timber is scarce, and where the difficulty and expense of fencing are very great.

Patents exist on the machine and also on the fence which were issued as follows:—One to James Moore, on June 30, 1857, for securing the pickets between twisted strands of wire; and the other for the weaving machine to James Moore and Archibald Kelly, on April 17, 1860. Further information may be obtained by addressing the patentees, Messrs. Moore & Kelly, at Pittsburg, Pa., or S. A. Heath & Co., No. 102 William-street, New York, who have a model of the machine, together with some samples of fence made on the large machine.

OUR SPECIAL CORRESPONDENCE.

Good Roads and Slow Coaches—The Happy and Intelligent Blind Boy—Riding to School on Horse-back—Nature's Record of the Rain-fall in the Rings of Trees—Years of Plenty and of Famine—Splendid Opening for a Great Invention and Speculation—People Adapting Themselves to the Climate, &c.

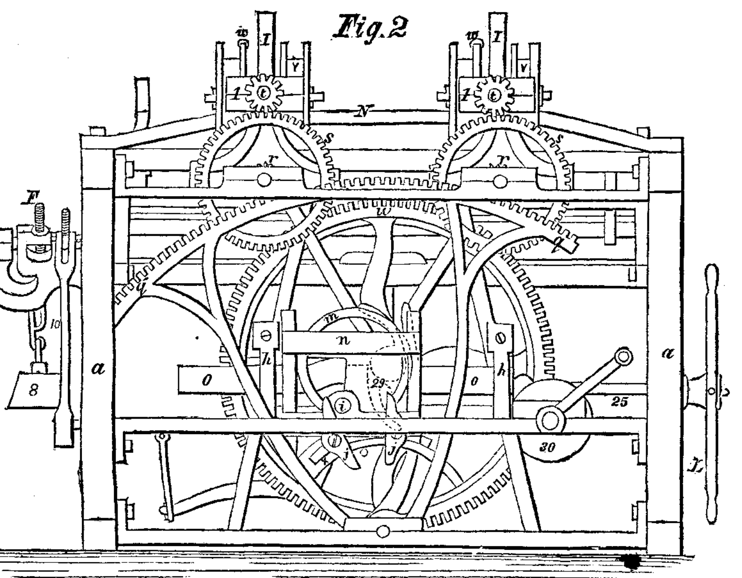
BELTON, Texas, June 30, 1860.

MESSRS. EDITORS:—Next to the building of railroads, the greatest opening for improvement in the travel of this State is some competition with the one great stage company who monopolize the business, and are coining an immense fortune out of it. They charge from 10 to 15 cents per mile for carrying a passenger, and drive at a snail's pace, making themselves as unaccommodating and unpopular as possible. An opposition to them on the best traveled routes could hardly fail to pay, and it would be welcomed with pleasure by the traveling community.

As you move westward in this State, you find a more rolling, rocky and gravelly country. The road from Austin to this place (60 miles) is the finest natural road that I ever saw. The black loamy soil is sufficiently filled with gravel stones to make it hard and smooth, and the road consists of a series of gentle ascents and descents over the rolling prairie nearly all the way. And yet, over this fine road, our speed in the stage was *less* than four miles an hour!

In the stage we had a blind boy and a deaf-and-dumb young man, both from the State schools at Austin, which, with the large asylum for the insane, are magnificent monuments to the enlightened humanity of the government. The boy exhibited specimens of his writing, his reading with the raised letters, and of his proficiency on the flute. He was engaged in animated conversation with me nearly all the way, showing unusual intelligence and capacity, and he seemed to be one of the happiest lads, notwithstanding his sad deprivation, that I ever saw in my life.

We passed on the road several school-houses, with horses about them tied by long ropes, showing that the scholars were gathered from so broad a district of this sparsely-settled country that many of them were obliged to ride every day to school. It is not merely in the general attention paid to schools that the evidence is found of the rapid progress of this community in intelligence; every department of science is being thoroughly studied by competent observers, and a vast mass of reliable facts have already been collected in relation to the geology, meteorology, zoology, &c., of the State. Some of these are of peculiar interest, and I may make them



the subjects of separate communications to your paper. One series of investigations, especially, has attracted much attention, from its bearing on the prospects of dry seasons—a subject which all the inhabitants, of course, regard as of primary importance. A cross section was sawed from a very large and old tree, and the surface planed and varnished, so as to show clearly the width of the annual rings As the tree makes a larger growth —and consequently, a wider ring—in a wet season than it does in a dry one, and as the outside rings have been formed during the time in which a record has been kept of the rain-fall, it is easy to trace back and read the history which Nature has herself made of the wet and dry seasons during the whole age of the tree.

The last five years have been dry, and corn in most parts of Texas has been worth $1.50 per bushel; but for a few years previously, the rains were abundant, and corn was generally worth some 25 cents per bushel. If the attempt is made to keep the corn from the wet to the dry seasons, it is eaten by weevils. Several plans have been suggested for preserving the corn from the attacks of the weevils, and this is a fine field for our inventors. To put up $25,000 worth of corn, at 25 cents per bushel, and keep it until it was worth $1.50 per bushel, would be a very easy way to make $125,000. The most plausible plan is to put it in cisterns, similar to those which are now employed for keeping water for use. It might be necessary to kiln-dry it; and it should doubtless be poured into the cistern during a "norther," which is a *cold, dry* wind. If these plans should not succeed, it would be very easy to expel the atmosphere from the cistern by means of carbonic acid gas, leaving the cistern filled with gas; and there can be hardly a doubt that this plan would be effectual. Perhaps it would be better to build the cistern or receptacle above the ground. I suggest the subject to the scientific and money-making men of Texas, as a promising field for experiment.

The people of the State are, however, about adopting, to a considerable extent, a plan more rational than the keeping of Indian corn from year to year, and that is the cultivation of barley and oats, in the place of corn. These may be sown in time to grow with the spring rains; and, wherever they have been tried, they yield excellent crops. This change of practice by which the people of this new State will adapt themselves to the climate is rendered very slow by the peculiar conservatism of farmers and by the scarcity of barley for seed, which was sold last year in some parts of Texas at $4 per bushel. Perhaps some of your readers who are grain-dealers will be bold enough speculators to ship a lot of barley to Houston for seed, this Fall.

I have now seen most of the settled parts of Texas, and shall, from this point, turn my steps homeward; anxious to get once more where I can hear the rain-drops occasionally pattering upon the pavements.

B.

EXPERIENCE AND EXPERIMENTS IN ADJUSTING MILL-SAWS.

MESSRS. EDITORS:—In this letter I propose to give you the results and experiments I have made at intervals of time in filing, setting and adjusting saws. Perhaps there is not so much difference in opinion upon any other one topic as upon this. The lumber interest of this country is an important one, which has long engaged the attention and continual efforts of inventors and others. It is a branch of our manufactures which has generally rewarded (pecuniarly speaking) the efforts of artisans in a satisfactory manner, and hence the importance of thorough research. The market value of lumber is greatly increased in value by good, smooth sawing. Most of the lumber that finds its way to the eastern market is sawed in the common upright saw-mills; and it is my purpose, firstly, to speak of my method of adjusting these kinds of saws.

After the saw has been placed in the "stirrups" or "irons" which hold the saw in the "sash," and made to hang in a perpendicular position, I take a plummet and line, and, placing the line on the point of the topmost tooth, let the plummet fall in the air and swing until it gains its place; then I throw the lowest tooth of the saw three-fourths of an inch out of perpendicular, so that in sawing, while the saw is in the "cut," the top of the saw strikes first. The advantages gained in this way of hanging the saw are as follows:—The log-carriage is more easily moved; a more rapid motion is made by the saw; the sawyer has a better chance to vary the "feed" or cut of the saw than is the case when the saw is hung in a more perpendicular manner.

In setting the saw, experienced sawyers prefer to set the teeth from their points to the back. In this way, the following benefits are derived:—First, in sawing, the dust is thrown out of the cut; the saw cannot rub against the sides of the "stock" while cutting, causing the saw to heat; the strain upon the teeth in sawing heavy timber is not so great, by far, as is necessarily the case when the teeth are set at the points only; and the lumber is freed of its fibrous sawdust, which clings in the cut when the saw is set only at the point, as is usually the case.

In filing, a great advantage is gained in holding the file at right angles with the saw; by so doing, the edge is made square, instead of oval, as it is when the file "rolls" upon the tooth. The upper edge of the teeth require as much care in filing as the under edge; and the reason is that, in the up-stroke of the saw, the fibers of wood are thrown out of the cut, instead of remaining in the lumber to detract from its value.

I have recently been experimenting upon filing two of the middle saw teeth, in such manner as to saw lumber nearly as smooth as it can be planed with machine planers. The result was successful in an eminent degree. Two of the teeth (one in one set and one in the other) I set in a curved line, so that they projected a very little at the side, so as to take a very thin shaving from the two sides of the cut. The top of these two teeth I file in a manner very similar to the method employed in sharpening shears. The above thoughts I have given for the benefit of young and inexperienced sawyers; and it may draw out of experienced mill-men their respective views upon this subject.

WM. B. BUXTON.

Montpelier, Vt., July 14, 1860.

FIRST NEW COTTON.—The first bale of new cotton was received here on the 15th inst., by Nelson Clement, Esq., per steamship *Philadelphia*, from New Orleans. The cotton was raised on the plantation of Judge R. B. Wofford, near Cuero, Texas, and was received by Mr. Clement's house in Galveston, on the 3d inst., for reshipment to his house here. This is said to be the third or fourth time Judge Wofford has succeeded in sending the first bale of the season. From the sample shown, the cotton is very handsome and free from leaf or dirt.

IMPORTANT improvements in diving apparatuses have been made and patented by Mr. C. E. Heinke, submarine engineer, London. It is stated that the apparatus is completely under the immediate control of the diver, and that it enables him to remain for several hours under water, at great depths, without inconvenience and with freedom of action. It has been tried with success.

THE HARBOR OF NEW YORK.

At this particular juncture of our commercial affairs, when the carrying trade of the Atlantic ocean is being successfully monopolized by immense iron screw steam vessels of great tunnage and draft of water, some apprehension justly exists among the merchants of this city as to the present condition of the harbor of New York and the maintenance of the requisite depth of water on the bar at Sandy Hook. Their serious attention has been called to the wash of earth from the streets and sewers of New York and Brooklyn into the slips bordering thereon, by which not only this harbor is being injuriously affected but the width of the channel inside of the bar at Sandy Hook is becoming seriously narrowed, and ultimately the depth of water on the bar will become greatly lessened. It is certainly time that the above class should be thoroughly awakened as to the importance of this subject; for it is pregnant with much evil if remedial measures are not at once applied. In this matter we should follow the example of the merchants of Boston, who, some time ago—awake to the great importance of the preservation of their harbor, and alarmed regarding the moderate depth of water in it—had an interview with the President of the United States, and solicited a commission to thoroughly examine it and duly report thereon with all possible dispatch.

Now, in view of the great interests that would be affected by any reduction of the depth of water on the bar at Sandy Hook, it has been deemed proper that some investigation should be made as to the extent of the deposit of *silt* into the rivers bordering upon New York, for the purpose of placing the results before the public, in order that its attention might be directed to the consideration of an element in our commercial position, secondary to none others, namely, the maintenance of a depth of water at the entrance of our harbor equal to the full requirements of our commerce, and with this object in contemplation, some time ago, Mr. Charles H. Haswell, marine engineer, of this city, proceeded to make such observations as he thought best calculated to furnish the essential elements in ths case, restricting himself to the subject of deposits in our harbor; he did not propose to consider the encroachment upon the boundaries thereof, by the extension of bulkheads and piers, and the injurious effects therefrom, for the twofold fact that the necessity of restraining these encroachments had become so manifest to the public at that particular time that not only had the attention of our Legislature been called to the subject, but it was then receiving the consideration of a committee appointed for the purpose of investigating and reporting thereon; and secondly, that the operation of such encroachment was so similar to that he proposed to investigate, viz: the reduction of the tidal volume of our harbor, that the deductions in one case would be equally applicable to the other. Accordingly, in a communication to the Board of Underwriters of New York, he thus lucidly and elaborately reports:—"As a prelude to my task, I assumed it to be indisputable that the bar at Sandy Hook was, in its general features, like the bars of all tidal rivers, and that it presented a series of irregular obstructions stretching across the entrance into the lower bay, with a varying and less depth of water upon it than in the channels within it. The causes admitted to produce this general result are numerous, but the following apply, in my opinion, peculiarly to the locality under consideration:—

"1st. The arrest of the current of the last of the ebb tide from the bay, where it meets the first of the sea flood when it surrenders the *detritus* it holds in suspension.

"2d. The difference of the flood and ebb currents in their directions.

"3d. The action of ground swells from the sea, which, if heavy and flowing from the southward and eastward, deposit sand and gravel upon the bar, and at all times, when aided by the current of the flood, within the entrance thereof.

"4th. The occasional diminution of the back water of the bays and rivers leading thereto from drouth, and the reduction of the tidal volume by the presence of ice upon flats and the shores

"5th. A reduction of the tidal area by the constant accretion of *detritus* upon the shores.

"The first three positions are similar, in a great degree to those entertained by E. K. Calver, R. N.; the fifth one, by Sir Henry de la Beche.

"In the prosecution of my observations, I selected sixteen locations which I thought best suited to furnish me with the elements desired, and providing myself with an equal number of bottles of like capacity (30 cubic inches), I repeatedly filled one of them with water from each of these localities at half-tide (both ebb and flow), both in dry and wet weather and at different seasons of the year; such water was then filtered, and the residuum weighed and noted in grains, the average results of which, deduced from the operations of five years, furnish the following:—

Weight, in Grains, of Deposits in 30 Cubic Inches of Water taken from the undermentioned Localities:—

Sandy Hook	.109	Manhattanville	.578
Narrows	.265	Harlem Bridge	1.031
Robbins' Reef	.367	Hell Gate	1.093
Ellis' Island	.811	Thirtieth-street, E.	1.265
Battery	1.687	Twenty-third st., E.	2.968
Liberty-street	6.927	Grand-street	4.000
Canal-street	8.531	Wall-street	5.187
Thirtieth-street, W.	.937	Broad-street	6.375
			42.131

"The mean weight of deposits is thus found to be 2.633 grains in every 30 cubic inches of water examined. (42.131÷16=2.633). Excluding therefrom all the city localities, except one upon each side of it, for the purpose of arriving at a mean of the average presence of *silt* in the water of our harbor above the Narrows, the following result is obtained:—

Narrows	.265	Manhattanville	.578
Robbins' Reef	.367	Harlem Bridge	1.031
Ellis' Island	.811	Grand-street	4.000
Battery	1.687	Thirtieth-st., W.	.937
			9.676

"From which it appears that the average annual flow of *silt* in the rivers bordering this city reaches the enormous rate of 1.209 grains in every 30 cubic inches of water (9.676÷8=1.209); and assuming the quantity of the former to be equal to 125 lbs. per cubic foot, a cubic inch of it will weigh .072 lb. The volume of this deposit compared with water, is, therefore, as 1 to 12,565

"Confining my observations to the city of New York alone, and taking the deposits shown in the water from the several localities around the city, the mean amount of *silt* in every 30 cubic inches of water is as follows:—

Battery	1.687	Grand-street	4.000
Liberty-street	6.937	Wall-street	5.187
Canal-street	8.531	Broad-street	6.375
Thirtieth-st., E.	1.265	Thirtieth-st., W.	.937
Twenty-third-st., E.	2.968		
			37.887

"The average of these deposits is 37.887÷9=4.209; and hence, by the elements before given, it appears that the volume of the deposit from the water in the slips of this city between Thirtieth-street (east and west) and the Battery, when compared with that of the water (at half tide), is as 1 to 3,610. Startling as these results appear, it must be borne in mind that they do not give a full exhibition of the facts of the case, for the observations made were necessarily confined to the presence of *silt*, and embraced only that portion which was retained in suspension by the flow of currents; whilst the deposit of *detritus* from the flow of gravel, sand, &c., could not be arrived at, unless by a different system of observation, and it is, consequently, not embraced in the above results."

[To be continued.]

APPLICATIONS FOR THE EXTENSION OF PATENTS.

Lantern to destroy Bee Moths.—Samuel C. Witt, of Hartleton, Pa., has applied for the extension of a patent granted to him on the 7th of October, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 10th of September next, and the petition will be heard at the Patent Office on the 24th of that month.

Buoyant Carriage.—Alexandrine Stanton, executrix of Henry Stanton, late of Kings county, N. Y., deceased, has applied for the extension of a patent granted to him on the 27th of February, 1847, for an improvement in the above-named class of inventions. The testimony will close on the 28th of January next, and the petition will be heard at the Patent Office on the 11th of February.

PLEURO-PNEUMONIA IN CATTLE.

As this "cattle disease" is still exciting a great deal of attention among all who are interested in agricultural objects, and as it is stated to have broken out in this city, and that two oxen died with it last week in the Central Park, every new fact thrown into the stock of useful knowledge respecting its nature and treatment is of inestimable value. We therefore condense the following, on the subject, from the *Irish Agricultural Review*, of the 22d of June; and its value will be more highly appreciated when we state that its author is G. S. Brown, Professor of Veterinary Therapeutics in the Royal Agricultural College at Cirencester, England:—

Taking into account the length of time during which the disease has existed, it seems curious that a perfect unanimity of opinion respecting its nature and treatment should not prevail. So far from this being the case, most opposite notions are entertained on both these points; and, of course, the advocates for each do not lack evidence in support of their own theory. That the lungs are, in some degree, suffering from inflammation is the general belief, as we gather from the positive statements. That common inflammation is frequently confounded with the epizootic disease we cannot doubt; and hence may arise the occasional success of measures which would be especially destructive in the actual presence of what they are meant to cure.

If in this article we shall advance ideas not at present current, we pray our readers not to be startled out of faith by their mere novelty; we claim only credit for having carefully looked into the subject, and drawn our own conclusions.

As anatomy must ever be the foundation of a correct system of medicine, a slight sketch of the organs mainly effected will not be out of place.

The organs of respiration, or the apparatus concerned in the process of breathing, are contained partly in the cavity of the chest formed by the ribs on each side, having the intermediate spaces filled with muscle. The whole interior of the cavity is lined by a fine transparent membrane, which also covers the various organs and parts contained. This membrane is called the "pleura." In the cavity are placed the "lungs" or "lights," the principal breathing organs, connected to the nostrils and mouth by a long tube composed of rings of cartilage, and termed the "wind-pipe." With the lungs we have mostly to concern ourselves. These organs, whose external appearance is familiar enough to everyone, are composed of several structures, to wit, the various minute branches of the wind-pipe, forming the "bronchial tubes," terminating in fine air cells, blood vessels in large numbers, with accompanying nerves, all bound together by a quantity of fine thread-like fiber, and covered with the before-mentioned "pleura." Between the two lungs are placed the heart and its large vessels proceeding to and from. As the disease we are about to describe is nearly confined to the lungs, this short description of their situation and structure is necessary to enable the reader to follow our remarks on the effects produced by the malady.

Our inquiry into the nature of the disease under discussion leads to the following conclusions, founded on observation of phenomena presented in the various aspects which the malady assumes. 1st, That pleuro-pneumonia is essentially and primarily a disease of the blood, consisting in a rheumatic condition of that fluid, evidenced by an excess of fibrin, with a tendency to its deposit. 2d, That owing to some obscure causes, probably atmospheric, the lungs receive an undue share of this diseased fluid, the viscid character of which prevents free circulation and promotes a sluggish condition, ultimately amounting to absolute rest. During this process the fibrin is deposited first at the lower part, and gradually over the whole organ, coating its membrane, compressing its air cells and tubes, and interfering with the respiratory function. A general derangement of the system is easily understood; when we start with a bad condition of blood, and under the combined influences of emaciation and loss of breathing surface, the animal dies. We repeat, the grand distinctions of pleuro-pneumonia are the absence of any inflammation or active determination of blood to the lungs, and the presence of a diseased fluid supplying slowly and certainly the material which will block up and obliterate the vessels and air cells. The symptoms from the first are suggestive of primary disturbance too dull, the muzzle is dry, or the milk is lessened, or rumination is irregular, or there is a fondness for remote corners of the field or yard—little things, we admit, but wonderfully significant when taken in connection with the prevalence of the disease in the neighborhood. All this time the breathing remains undisturbed.

After a while, the deposit advances sufficiently far to diminish the respiratory surface, and then, as a natural consequence, the animal is compelled to breath more quickly: and be it observed that the frequency of the respirations will be in proportion to the amount of obstruction. From the irritation and oppression the pulse becomes now excited, the digestive functions are impaired, the blood in the lungs is only partially purified, and general emaciation follows, until, at last, the animal is a living skeleton.

During the whole career of the affection, we find no sudden changes—everything is gradual, the breathing and pulse are gradually quickened, the body gradually wastes; in short, nothing like acute disease can be perceived, and one is unwittingly lead to wonder how it could have been confounded with inflammation for so long a time after its appearance.

Passing from these considerations to the question of liability, we discover that the subjects are very diverse. Animals in weak condition, milking cows, and fatting oxen, seem alike its victims; and, in one county or other, either of these classes is occasionally specially selected. The animal most secure is, without doubt, the one in the highest state of health. Working animals that have been well fed, and possess what is called hard condition, are the most exempt. On the other side, all those exposed to debilitating influences, whether referring to food in excess or defect, to disproportionate work or bad stable management, are in a condition favorable for the attack, should the specific cause reach their neighborhood.

An important question occurs as to the contagious nature of the malady. Much difference of opinion exists on this point; but, certainly, no exact evidence can be advanced to show that it can be transmitted from one person to another, in any way, not even by direct inoculation. Still, we would be understood as advocates for precaution; no good can result from allowing the contact of healthy and diseased subjects. So should the farmer act, as though every affection among his stock was infectious in its nature.

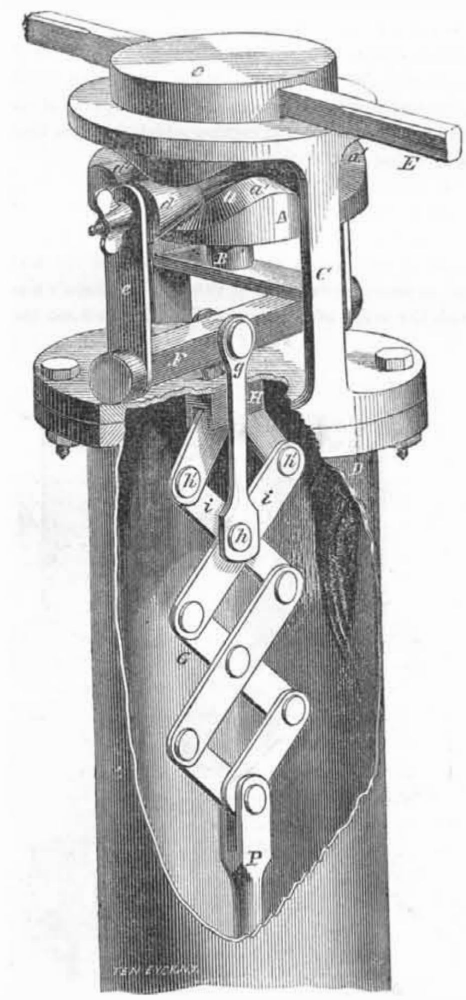
Treatment: On this point we must of necessity be concise. Confining ourselves to the consideration of the principles, and leaving the practice to the discrimination of the attendant, our conclusion as to the positive nature of the affection will decide our system. We have admitted the presence of a highly fibrinous blood, with a sluggish circulation through the lungs, as the principal evils. The indications obviously are, then, suggestive of measures calculated to dissolve and lessen the fibrin; and, to keep the blood in motion, any agents which, alone or in combination, will do this, recommend themselves. Ammonia in any of its active forms is among the best; it seems to have a particular power to keep the blood fluid, and combines the property of a stimulant. The use of this drug externally and internally we have found most successful; we do not suggest it as a universal cure, but we claim for it the importance belonging to it as an alkali and stimulant. Fancy may be allowed some play, and any plan which shall include the use of alkalines, stimulants and tonics, with counter-irritants externally, is, at least, founded on correct principles.

Prevention is proverbially to be sought before even cure; but, unhappily, we can only have recourse to generals in speaking of it as applied to this disease. At one time inoculation was thought to be as valuable as the vacine disease in its preventive influence. Among the Germans the belief even now obtains in its favor, but more extended experiments have demonstrated that pleuro-pneumonia cannot be transmitted by inoculation, nor any immunity obtained by the performance of the operation. As we have hinted, attention to the general health, the use of every measure calculated to promote good condition, will do much; beyond this it seems we possess no control over the attacks of the malady or the susceptibility of the system.

THE *Atlas* steamship, belonging to Messrs. Burns & McIver, of Liverpool (England), has all her interior iron-work, even to her tanks, coated with zinc.

IMPROVED PUMP MOTION.

The most common motion that is applied to the pistons of upright cylindrical pumps is a vertical reciprocating one—up and down alternately. The engraving illustrates an entirely different motion applied as the first effort, although the piston has the usual up-and-down action. The invention consists in the arrangement of a horizontally rotating cam disk in combination with a rising and descending yoke, and with a series of lazy-tongs (expanding and contracting cross levers), in such a manner that, by rotating the disk, a rapid reciprocating motion is imparted to the piston.



A represents a disk provided with a cam groove, *a*, and it is attached to a vertical shaft, B, which has its bearing in a frame, C, that is firmly secured to the top of the pump barrel, D. The shaft is rotated by the levers, E, and they are inserted into proper sockets, as represented. The cam groove, *a*, forms the guide for friction rollers, *d*, which are secured to the upper ends of arms, *e*, and project from the yoke, F. The shape of the cam groove is such that, on rotating the disk, the yoke is made to rise and descend several times during each revolution of the shaft. The cam groove has four projections, *a'* forming a uniform wave line, causing the friction rollers, *b b*, to rise and descend. Any number of such elevations and depressions may be employed to give such a number of strokes as may be required during each revolution. The yoke, F, connects by rods, *g*, at the side, with the second pair of links, *i*, of the lazy-tongs, G, through a pivot, *h*. The ends of the first links of the lazy-tongs pass through a bracket, H, and the ends of the lower links are embraced in the fork of the piston rod, P, and held with a pin, as shown in the open section of the pump barrel. By moving the yoke, F, up and down by the horizontal rotation of the plate, *c*, of shaft, B, the whole series of lazy-tongs are extended and contracted alternately, and this moves the piston rod, P, up and down in the barrel, and also the piston which is attached to the lower end of it.

It is believed by the inventor that pumps can be operated in this manner with much greater ease than by the common up-and-down lifting motion that is usually applied.

A patent was granted for this invention on June 12, 1860, and further information may be obtained by addressing the inventor, Edward Wade, of Norwich, Conn.

NATURAL PRODUCTS AND MANUFACTURES OF VIRGINIA.

MESSRS. EDITORS:—I ask a small space in your columns, as I am otherwise unable to answer the numerous inquiries of your readers in relation to the minerals of this State, since the publication of my note on "American Manganese" (page 338, Vol. II, SCIENTIFIC AMERICAN), and this letter, I propose, shall give such information as most of them seek.

I am as much surprised at the present manifestation of interest and inquiry in relation to our minerals and their development as I have been surprised that the most promising mineral, mining and manufacturing portion of this State or, in fact, this continent, has been so long neglected, and its great value and importance so little known. I will not pretend to give a geological description of Virginia. I will only say, in a few words, no State or no country in the world can be richer than this in the useful minerals, and particularly coal and iron. Even the great manufacturing State of Pennsylvania is behind us in natural resources. Your readers need no other proof of this than a reference to a map of this State or the country, with such geological knowledge as we must suppose most of your readers to possess. We see the great Appallachian chain of mountains rising from the lakes of the North and disappearing below the alluvial of the Gulf States. This great mineral range reaches its climax in the heart of Virginia, and her rivers, running from the summit of the Alleghanies, cut a geological section from the highest or latest formations down to the lowest and oldest. We may say all the strata of every geological formation lie opened like the leaves of a tablet, and the riches of the mineral kingdom lie temptingly exposed. Every mineral peculiar to this country must here exist. I cannot point out the many coal fields and mineral deposits; but I wish to call attention to one magnificent region where the mineral wealth of Virginia seems centered, and where all the lavish gifts of bountiful Nature are represented. See where the great Kanawha enters the Ohio; trace it up through those vast deposits of coal and salt. More fuel and oil and gas lie beneath the mountains that cast their vast shadows over its dark waters than would supply the world for hundreds of ages. But do not be satisfied with these small items; further up it cuts the mighty Alleghanies to their base, with all the lower ranges of accompanying mountains that rise like steps on either side. Here we have the coal, iron, limestone, lead, manganese and most of the minerals from the carbonaceous down to the lowest silurian. Above this, we enter the great limestone formation peculiar to the valley of Virginia, and which extends, with the same characteristics, from Tennessee to New York. But here it is higher than at any other point, and is surrounded by resources of natural wealth not found in such close proximity at any other spot known.

Where the Virginia and Tennessee Railroad crosses this river (here known as the New River) seem centered all the availabilities that the miner and manufacturer could desire. The river descends from the mountains of North Carolina and Virginia through inexhaustible deposits of iron, copper and lead. The iron ores are almost as plentiful and profuse as the common rocks, and are not now more noticed or valued. The copper has recently attracted much attention and has been extensively developed in quantity and quality beyond doubt or speculation. Lead has been mined in the neighboring county of Wythe for one hundred years, and still the "Old Wythe Lead Mines" are actively worked with a profit of over fifty per cent to the operators!

Limestone is the most plentiful rock and forms the bed of the river for some sixty miles, and the bed or grade of the railroad, crossing the river, between two and three hundred miles; altogether forming one of the richest agricultural regions in the world, I believe, without exception. A coal field of considerable extent crosses the river some ten miles below "Central," or the point of reference where the railroad crosses the river. It has been sufficiently developed to demonstrate its great practical value, and contains anthracite, semi-anthracite and bituminous coal. It is now used extensively on the line of the railroad and found to be pure and durable in character.

In the center of a rich agricultural district we find the richest mineral deposits—coal, iron ores and limestone

—within a stone's throw of each other; not the lean ores of the coal field nor the impure ores used in many parts of this country, but rich brown hematite, and a coal that requires no carbonization for smelting purposes. Where else do we find so many facilities and natural advantages? Here too, we can obtain a vast and almost unlimited water-power, with a healthy location and a elimate of the most delightful and grateful temperature, not so hot even as eastern Virginia nor so cold as the latitude of Philadelphia. Located in the midst of the richest mineral region, and surrounded by fertile, productive and extensive plantations and farms, in a congenial climate and blest with every advantage Nature can supply, we also find every inducement to attract enterprise and wealth, the best promises for remunerative investment and the greatest scope for practical acquirements, with an almost unlimited future for progressive industry and a certain and ample reward for every proper exertion.

The cotton of the South is very accessible, and the wool of the West can also be very easily obtained. Even the surrounding counties produce vast quantities of sheep. The finest upland pastures exist on the mountains of Virginia, and millions of cattle and sheep go to Baltimore and our own cities yearly. Then its advantages as a manufacturing locality are not greater than its facilities to the best markets in the world. The entire South and West, and even the North-east, as far as the waters of the Chesapeake, are open (by rail and river) to every class of manufactured goods, and almost all kinds of goods may be fabricated here, since the raw material and every natural facility exist in abundance. Capital, Enterprise, Experience and Industry may and will make Central the rival of Pittsburgh and Lowell. But this great inland site of a city-in-embryo scarcely deserves the name of village. Its gently-rising slopes are still covered by fields of waving grain and groves of sturdy trees.

A gigantic scheme has been suggested for the development of the mineral and manufacturing interests of Virginia The enterprise centers in Central. This magnificent site may and should be made available, since the result of such a development would confer more benefit on a larger number of people than the consummation of any project now before the world No bonds are so strong as self-interest. The same policy that applies to Pennsylvania naturally applies to Virginia. It is the only plan to fully develop the border States—to make their people see clearly their own best interests—to prove to the South the value of all manufacturing processes, the wisdom of home protection and the true principles of political economy. It will open another great outlet to the trade of the boundless West and give a new impetus to the entire industry of the South.

Ten millions of dollars would open the great Kanawha to Central, and would complete a canal to the head of our present navigation; would bring steam from the Mississippi and the Ohio to this point, and thus, either canal navigation or railroad would connect with Richmond and the magnificent harbor of Norfolk—265 miles by canal and 220 by railroad would connect with the tide waters on the James Through these channels a great proportion of the trade of the western waters would pour, and the great undeveloped trade of the south-west parts of Virginia, North and South Carolina, Georgia, Tennessee and Alabama would buy and sell to the North through those channels. A short canal —only 65 miles—would be crowded as soon as completed with the trade of an unlimited interior—a manufacturing city without limit in extent or means might be thus built up—a great State might be fully developed—a people might be enriched and otherwise profited—an immense trade might be driven from new sources and through new channels—a vast harbor for the idle ships of the North would be opened—a new field for capital, enterprise and labor would be presented, and a fruitful source of gain and profit would thus be secured to all interested. It is time the capitalists of the North should turn their attention from the West to the South. The engineers and agents of France are now here, and if the field is left to them, "our bonds must break." It is their policy to weaken our ties, if they would profit.

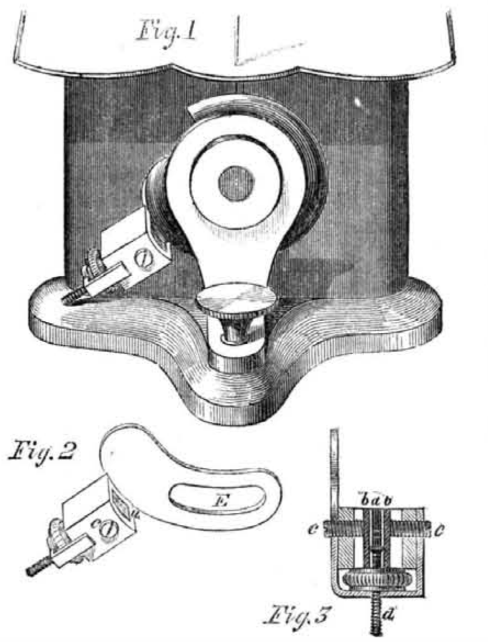
S HERRIES DEBOW.

Richmond, Va., July 14, 1860.

MORTONS' LOOP CHECK, ADAPTED FOR THE WHEELER & WILSON SEWING MACHINE.

We do not believe there is to be found in the whole world of mechanism a more ingenious contrivance than that for passing the lower spool of thread through the loop in the upper thread formed on the return of the needle in the Wheeler and Wilson's justly-celebrated sewing machine. In the first place, the form of the spool is such as to enable it to be passed through the loop and returned with a reciprocating motion of very small extent, thus permitting the motion to be slow though performed many times in a second. Then the loop is carried around the lower spool by a revolving hook, using the rotary motion which may receive a high velocity without shock or jar. It is well known that the greatest practical annoyance which has been encountered in using these admirable machines is in the adjustment and removal of the leather pad which holds the thread upon the looper until the proper point is reached for its release. The invention which we here illustrate is intended to obviate this difficulty.

It consists in the substitution of a fine hair-brush in place of the leather pad, and in the arrangement for its convenient and delicate adjustment, which the accompanying engravings illustrate. Fig. 1, in the annexed cut, represents the looper of Wheeler & Wilson's machine with the brush attached, and Figs. 2 and 3 are views of



the brush and its case detached from the machine. The fine, flat hair-brush, *a*, is placed between two iron plates, *b b*, the pressure of these plates against the hair varying the rigidity of the brush, and being regulated by the screws, *c c*, by which also the lateral position of the brush may be adjusted. The pressure of the brush against the looper is regulated by the screw, *d*, and the slot, E, permits the position of the brush case to be adjusted upon the machine.

This invention was patented, July 26, 1859, by J. W. Morton, of Hopkinton, R. I., and its comparative advantages are thus stated by the inventor:—

First: It is composed of hair which is permanently elastic, and never becomes hard.

Second: It never requires any oiling; therefore, there is never any danger of soiling the work through its agency.

Third: It can be more nicely adjusted than any other. There are three independent adjustments to this check, while no other has more than two. The lateral adjustment by means of set screws, which is peculiar to this loop check is very important, and even indispensable in very fine work. The others may happen to be right, but this can be set within the one-hundredth part of a hair's breadth of its true position.

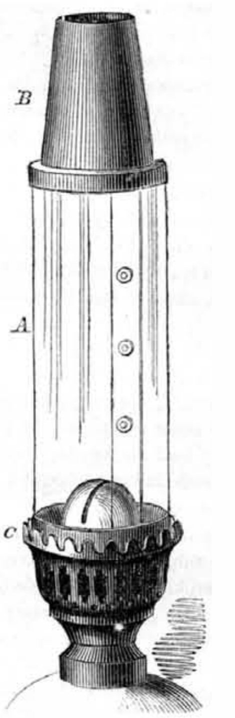
Fourth: It is remarkably durable. Perhaps no substance yet discovered will wear so long as fine hair, in contact with a smooth metallic surface.

Fifth: The perfection with which it works saves the time, the patience, and the temper of the operator.

Any further information in regard to this invention may be obtained by addressing Cottrell & Babcock, who manufacture the attachments at Westerly, R. I.

HUMPHREY'S MICA CHIMNEY FOR LAMPS.

To burn coal oil a chimney is indispensable on the lamp; and as this oil is coming into almost universal use where gas is not introduced, the demand for lamp chimneys is becoming enormous. All who have had experience with these articles are aware that they are usually made of very thin glass, to prevent being cracked by the heat, and are consequently fragile, and the source of constant annoyance and considerable expense by breakage. The invention which we here illustrate effectually remedies this difficulty.



The chimney is made of a thin plate of transparent mica, bent in the form of a cylinder, A, and riveted at the joining edges as shown. A metal cup, B, is fitted to the top to receive the shade, and a metal base, C, is secured to the bottom to support the chimney upon the lamp. It is for this combination that the patent is granted. Many will say this is a very small and trivial affair, on which to take a patent, but it is, notwithstanding its simplicity, one of the most useful and practicable inventions of the day.

The patent was procured through the Scientific American Patent Agency, July 17, 1860, and persons desiring further information in relation to it should address the inventor, J. Y. Humphrey, at No. 321, North Second-street, Philadelphia, Pa.

THE ECLIPSE.—The wonderful accuracy of astronomical observations and calculations was again shown by the occurrence of the solar eclipse on the 18th inst., at the exact instant which had been so long before predicted. As the little hand on the astronomical clock came to the fraction of a second which had been announced, the dark form of the moon, moving along on her appointed course, was seen to come in line between us and the edge of the sun. The morning here was clear and the eclipse was generally seen by our citizens, but the most accurate and valuable observations were made by the amateur astronomer, Mr. Rutherford, through his large equatorial telescope, which was used for taking ten photographs of the sun, showing as many phases of the eclipse, and a remarkable cluster of spots upon the sun's face. These have been published and are for sale by Rintoul & Rockwood, 839 Broadway, this city.

HEAVY FAILURES IN THE LEATHER TRADE.—A crisis has occured in the hide and leather trade of Great Britain, and some failures are announced; the list is headed by the large house of Stratfield, Lawrence & Mortimore, of London, with liabilities estimated at $5,000,000. This failure has produced a great sensation throughout London and the provinces, and a long list of other houses are reported to have succumbed, with liabilities amounting (so far as the facts are announced) to about one million dollars more! The entire leather business has thus been thrown into confusion and the value of English hides has fallen 30 and 40 per cent. The American houses in Liverpool in the hide trade are not compromised.

TOMATO CATSUP.—As the time is at hand for enjoying this favorite sauce, the following is a very good receipt for preparing it for future table use:—To a half bushel of skinned tomatoes, add one quart of good vinegar, one pound of salt, a quarter of a pound of black pepper, two ounces of African cayenne, a quarter of a pound of allspice, six good onions, one ounce of cloves, and two pounds of brown sugar. Boil this mass for three hours, constantly stirring it to keep it from burning. When cool, strain it through a fine seive or coarse cloth, and bottle it for use. Many persons omit the vinegar in this preparation.

REFORM IN WEIGHTS AND MEASURES.

BY E. M. RICHARDS.

The unit of long measure being established, as stated in my last article, the unit of square or surface measure was directly obtained from it; this latter unit is a decameter squared, that is to say, it is a square, each side of which measures 10 meters, and consequently it contains 100 square meters; this is called the Are. The other denominations of this species of measure were formed decimally, on the same general plan as that indicated for long measure, only that the operations were not so far extended. The usual multiple is the hectare—a square of 100 meters on each side; and the corresponding sub-multiple is the centiare—a square meter. These terms are found sufficient, and are those usually employed in transactions relative to land.

The measure of capacity likewise depends on the meter. The unit of this measure is called the Liter, and it is a cube, each of whose sides measures just one decimeter; it is raised to a higher or lower denomination by the same prefixes as in the other cases; and it is generally used for liquid measure; while the hectoliter is for grain. A cubic meter of water, or 1,000 liters, is a tun in weight. The standard of weight was thus obtained; it is the weight of a cubic centimeter of pure water under certain fixed conditions of temperature, pressure, &c., and it is designated a Gram. (The various standards and their multiples and sub-multiples are spelled in this article as they would naturally be in English, not as they actually are in French.) The multiples are the decagram, which equals 10 grams, the hectogram of 100 grams, and the kilogram of 1,000 grams. A thousand kilograms would form a cubic meter of water, and is, as mentioned above, the equivalent of the tun, for heavy weights, and is termed a millier. The submultiples are the decigram, centigram, &c. The milligram is a very light weight indeed; being about .015 of a grain Troy, while the kilogram equals about 2.2 pounds Avoirdupois.

The only remaining denomination is that for solid measure, the unit for which is the Stere, equal to a cubic meter, and therefore equal to the kiloliter, the abovementioned measure of capacity. The multiples and submultiples of the stere are the decistere, equal to the tenth part of the standard, and the decastere, containing one hundred of them.

In France the unit of coinage is the Franc, weighing five grains, and composed of a specified amount of pure silver and alloy, being thus connected with the metrical system.

It is to be remarked that, as tables of specific gravity are always calculated with reference to the proportion between the weight of pure water and the various substances, and as the table of weight in the above system is decimally arranged, likewise having water for its basis, the specific gravity will show the absolute weight of the substance under consideration; thus, silver being 10.474 times heavier than water, and a centimeter of water weighing a gram, a centimeter of silver weighs 10.474 grams; or a cubic meter (a stere) of silver would weigh 10,474,000 grams, or equal to 10 tuns, 474 kilograms; and so of any other substance.

From the foregoing it will be seen that there is provided one ample set of measures for each kind of work, namely, the Meter and its denominations for long measure, the Are for square or surface measure, the Liter for capacity, the Gram for weight, and the Stere for cubic measure; the last being only another name for a *solid* meter. Finally, the coinage of the country is intimately related to the measures; forming, it may be said, "part and parcel" of them, and *all* intimately based on the size of the globe itself! It is a very beautiful and philosophical arrangement, infinitely superior to our lengthy and imperfect contrivances, though these latter have been simplified by law. But the greatest advantage of all connected with the French system is that it is decimally arranged. Very great men—principally generals and statesmen—have stigmatized the decimal system as being unnatural and "contrary to the mind of man;" but it is not known that computers and those who have much to do with figures are in any way opposed to it. On the contrary, it is believed that those who have had fair experience of both sides of the question will declare, by a sweeping majority, in favor of a reform in this branch of our "institutions."

It is not here advocated that the *currency* of this country should be changed; it is a very admirable one, as it now is; but the adoption of the French system of weights and measures would greatly benefit all classes. Of course, no reform can be brought about without inconveniencing some persons; and the one here proposed would no doubt, *at first*, be perplexing to all; but the ultimate gain would be so great that this temporary trouble would be as "dust in the balance" compared with it.

At one time the writer of this article was opposed to the French nomenclature, as being too lengthy; but he now likes it, and would adopt it along with the measures themselves. It certainly would be injudicious to retain our present *names* and give to them a different *value* from what they now possess; such a course would be certain to cause mistakes. If we get new quantities to deal with, we assuredly must give them new names.

The foregoing imperfect sketch of a very interesting subject is hastily drawn up, hoping that it will be the means of calling attention to this too-much-neglected matter.

THE LIGHT FROM LOAF SUGAR.

MESSRS. EDITORS:—I was much interested in the perusal of two articles published on pages 325 and 371, Vol. II., SCIENTIFIC AMERICAN, and entitled "Philosophy in an Eggshell." Your able correspondent "R. W." gave a very satisfactory explanation of the cause of the difference in temperature between the large and small ends of an egg; but in regard to the phosphorescence of sugar I think that *still more light* can be thrown on the subject. "R. W." asserts that "the light proceeding from either the friction or fracture of sugar is wholly electric,' but his only proof of the assertion is that the experiment will not work in damp matter. Although I have never observed this last peculiarity, the following variation of the general experiment is quite familiar to me. I mix the sugar with the whites of eggs in the same manner as is done for the frosting of cake. This mixture when spread out and dried, emits a stream of light on being scratched quickly with a sharp point, forming a brilliant phenomenon when performed in the dark, as figures and even words can be written as if with liquid fire. If this is electricity it evidently must be frictional; and the principle indications of a disturbance of the electric fluid in any body or bodies are *attraction* and *repulsion*.

If we present two pieces of sugar to a pith ball, suspended by a silken thread, we do not find the slightest attraction—not even to a fiber of cotton. If we take the electroscope (an instrument for showing the slightest trace of electricity) we may perhaps perceive a slight disturbance of the gold leaves, but not so great as we should have from merely striking together two pieces of wood or almost any other substance.

To show the electric light, it is requisite that quite a considerable quantity of tho fluid be disturbed. For instance take a half a sheet of common brown wrapping paper, and hold it to the fire till it is perfectly dry and slightly hot; now draw it briskly between the body and the sleeve of the coat, so as to rub it on both sides at once by the woolen. The paper will now be found highly electrical, so that if held near a papered wall, it will fly up quickly and adhere for a considerable time. Then if quickly torn off, in a darkened room, it will clearly show the electric light accompanied by a faint snapping noise. If the paper when excited be held over a large fleecy feather, the latter may be made to fly up to the distance of a foot or more, showing a powerful attraction. Again: support a bright tin plate upon a clean and dry drinking glass; excite the paper as before, and lay it upon the tin; now hold a knuckle to it quickly and you will receive the electric spark. In this manner a Leyden jar may be slowly charged.

A large variety of substances show electrical phenomena by friction, such as a lump of sealing wax or brimstone when rubbed with a piece of flannel, a piece of india-rubber, a sheet of writing paper, or (as a more familiar experiment to the juviniles) the rubbing of a black cat's back in the dark, on a frosty night (all these experiments succeed much better in dry or frosty weather) or the brushing down a horse in the dark, when we frequently hear a crackling noise and perceive bright sparks of light. These are all electrical effects, and are at the **same time accompanied by a strong attraction, as will be** found by experiment. On bringing a metallic point near an electric light, we perceive a star on its tip, showing that the fluid is attracted by it, but the light from the sugar shows nothing of this kind. The light proceeding from loaf sugar is generally conceeded to be of a phosphorescent character, that is, it is a light which is emitted without sensible heat or combustion. This we see almost every day in a variety of forms; for instance, the fire-fly, and what is generally termed the "fox-fire" —a light proceeding from decaying wood or vegetable matter. Many minerals also show a light on being struck or rubbed together in the dark. Most varieties of quartz—even our common white pebbles—show a beautiful light; some red, others blue. Some of them appear to be luminously transparent at the instant of being struck together, giving a sufficient light to see the hour by a watch-dial. During the decomposition of certain animal substances a kind of phosphorescence may also be observed. Thus, if a small piece of fresh herring or mackerel be put into a two ounce vial of sea-water, or fresh water to which a little common salt has been added, and the vial be kept in a warm place for two or three days, there will then appear a luminous ring on the surface of the water, and if the vial be shaken, the whole will give a phosphorescent light. I recollect, in fishing in the night, on one occasion, on opening a box of "angle worms," they presented the appearance of *a living mass of fire;* creating quite a sensation among the company who unanimously agreed to call it "electricity" without giving a thought as to how electricity should come in a damp metallic box like that. I have observed a strong propensity of the public in general to ascribe everything strange or unnatural, or which they cannot explain, to the agency of electricity. I have even seen ascerted in print, that "the sparks produced by flint and steel are electrical phenomena." In like manner, the most astonishing effects exhibited by spiritualists, mesmerizers, and psychologists, are all confidently ascribed to the agency of electricity. Perhaps this might be preferable to supposing such effects to be due to the influence of departed spirits; but I should prefer calling them mysterious phenomena of the human mind.

I recently had some conversation with a lecturer on psychology who explained everything by electricity. His experiments were, of course, curious and interesting. The "subject," he said, was charged with electricity though standing at the time on good conductors. I asked him why the electric fluid did not immediately pass off and restore the equilibrium with the surrounding bodies, and also why it did not show its presence to the electroscope when the latter was presented to his person. The lecturer's explanation was that it was a *different* kind of electricity, or electricity in a different state—in fact that it showed no attraction and repulsion, nor an test of electricity in a single point: that it was merely *a mysterious agent.* Why call it electricity at all? why not term it anything else with equal propriety?

When quite young, I had a passionate longing for an electrical machine; and I made one that answered every purpose at trifling expense (but not of loaf sugar). As this plan may be of use to the readers of the SCIENTIFIC AMERICAN I will give it here:—I procured a common round pie-dish made of tin, and about eight inches in diameter; this I filled with a mixture of one pound of resin and two ounces of beeswax, which compounded on being melted, poured in and suffered to cool, formed an electric plate. I next took a round piece of wood, six inches in diameter, and half-an-inch thick, with the corners rounded off, and covered it with tin-foil; cementing a long two-ounce vial with the neck downwards into the center for an insulating handle. This completed the apparatus. Scrape the resinous plate slightly with a knife so as to roughen it; then rub it quickly with a piece of flannel or silk handkerchief; then place the wooden plate on it, and touch it with the finger; now remove it by means of the glass handle and it will give a strong spark (in good weather) more than one inch in length. A Leyden jar can easily be made as described in our school philosophies; and in the absence of tin-foil, a commrn tea-chest sheet lead answers a very good purpose.

One word of caution:—In making my first Leyden jar I used a common green glass jar, such as is used for fruit, and I was extremely puzzled to know why it would not hold a charge, but it would not do at all. **The com** mon glass manufactured in this country (similar to window glass) is *not* a non-conductor; the charge will pass through it readily, although many of our published works on electricity seem to have overlooked the fact. Nothing but clear, white English glass should be used.

Such an apparatus as that above described will answer almost every desirable purpose, and its cost is within the means of every one. Although I have now been engaged for several years in giving lectures on chemistry and electricity, making the principal part of my apparatus myself, yet I still carefully preserve my first electrical machine to remind me of the happy hours I occupied n making it in my boyhood days.

AMOS I. ROOT.

Medina, Ohio, June 29, 1860.

AMERICAN NAVAL ARCHITECTURE.

[Reported expressly for the Scientific American.]

THE STEAMER "SALVOR."

This steamer was constructed in Buffalo, N. Y., and has recently taken her appropriate position on the route of her intended service—Tampa Bay to Havana. As she is a well-built and staunch vessel in every particular, we surmise the details of her construction will prove of interest to the readers of the SCIENTIFIC AMERICAN; they are as follows:—Length on deck, from fore-part of stem to after-part of stern-post, above the spar-deck, 183 feet, 6 inches; breadth of beam at midship section, above the main wales (molded) 26 feet 6 inches; depth of hold, 12 feet 3 inches; depth of hold to spar deck, 19 feet, 3 inches; draft of water at load line, 9 feet 7 inches; tunnage, 470 tuns. Her hull is of white oak, &c., and square fastened with iron, treenails, butt bolts and large spikes. Distance of frames apart at centers, 18 inches. The floors are molded 12 inches; sided 12 inches.

The *Salvor* is fitted with one vertical direct-acting engine; diameter of cylinder, 30 inches; length of stroke of piston, 36 inches, diameter of propeller, 10 feet 8 inches; pitch of same, 19 feet, and has four blades, materials of same, cast iron.

She is also supplied with one return flue boiler, located in hold; possesses a water bottom; does not use blowers to furnaces; has one smoke pipe; no bulkheads; knees under spar and main decks; has two extra size anchors, and two masts. In addition to these features, she has one independent steam fire and bilge pump, and bottom valves or cock to all openings in her bottom. Ample protection has been made with tin, &c., against communication of fire from boilers. The cabins are on her spar deck; bunkers of wood; she is well coppered her rig is that of a schooner. This vessel is designed to carry large loads of cattle on her main deck. The machinery was constructed by and under the supervision of Mr. David Bell, of Buffalo, N. Y.

THE STEAM PROPELLER "JOSEPHINE."

This steamer was constructed by the well-known builders, Messrs. Harlan, Hollingsworth & Co., of Wilmington, Del., for the Philadelphia Steam Propeller Company, to ply between the ports of Philadelphia and New York. As she is claimed to be a good vessel of its description, we proceed to give the essential elements of its construction for the benefit of the readers of this paper. Length on deck, from fore-part of stem, to after-part of stern-post, above the spar deck, 135 feet; breadth of beam (molded) 22 feet 8 inches; depth of hold, 9 feet 3 inches; draft of water at load line, 6 feet 6 inches; tunnage 275 tuns.

Her hull is of wrought iron plates, $\frac{1}{4}$ and $\frac{3}{8}$ths of an inch in thickness, and very securely fastened with rivets $\frac{3}{4}$, $\frac{5}{8}$, $\frac{1}{2}$ and $\frac{3}{8}$ths of an inch in diameter, every 3, $2\frac{1}{2}$ and 2 inches

The *Josephine* is fitted with one vertical direct-acting engine; diameter of cylinder, 30 inches; length of stroke of piston, 2 feet 4 inches; diameter of propeller, 6 feet, number of blades 4; materials of same, cast iron.

She is also supplied with one return flue boiler, located on deck; does not use blowers to furnaces; has no water bottom; one smoke pipe, one independent steam fire and bilge pump, and ordinary bilge injection. Ample protection against fire has been made; this vessel has two athwartship water-tight bulkheads, and freight-house on deck. The machinery was constructed by Messrs. Reaney, Neafie & Co., of Philadelphia.

We believe the propeller used on this vessel is the "Loper Propeller," invented by Captain R. F. Loper, of Philadelphia. The screw is all cast in one piece, its diameter is 8 feet; width of blade at hub, 2 feet 3 inches; and at outside, 4 feet 4 inches. The angle of the blades at the axis is 30°; at the outside 54°. The alteration of angle, on increasing pitch, affords a greater outward action of the blade at the entrance, and leaves the water without revulsion, thus avoiding the "slip." The blades occupy 6-10ths of the area of the circle, when viewed in the direction of the axis, thus leaving 4-10ths for the free escape of water between the blades. The weight of this wheel is about 3,000 pounds.

AN EXTRAORDINARY MILITARY DRILL.

A military company from Chicago—calling themselves the "Zouaves"—have recently visited this city and have astonished and delighted the New Yorkers with their extraordinary tactics. On one occasion the Zouaves paraded in the City Hall Park, in front of our office, and were then put through a course of the most vigorous drills in the manual; loading and firing, and company movements, in common, quick and double quick time; skirmish drill or disposition against cavalry and deployment. The universal sentiment was one of astonishment and commendation, and it was admitted on all sides that such a drill was never before witnessed in this city. The company seemed to move like a collection of clocks, even in loading and firing, and stacking arms.

In the manual, the light infantry drill commanded unusual applause. In the loading and firing, the regular ramming, and breaking of the cartridge with the hands, the return ramroad, and simultaneous firing, were excellent. In the company movements, the "break into platoons," "exchange ranks while on the march," "oblique by platoons," "wheeling," and "countermarching," both in quick and double quick time, drew down continued plaudits, even from the military spectators who constituted the escort to the Chicago company. But the most surprising part of the drill was that without knapsacks; the deploying from one end of the park to the other in companies of five as skirmishers; formation of company pyramid, preparing against cavalry assault, the bayonet exercise, retreat and shout of the rally, produced a perfect *furore* of applause. The whole wound up with an exhibition of loading and firing while lying on the ground, running forward and retreating with an agility that would seem to enable them to dodge between the balls in a real engagement. Their surprising springiness, muscularity and general gymnastic excellence was particularly developed in these movements, and the rapidity with which they dropped down on their stomachs, turned over on their backs and loaded, turned back and fired, jumped up by platoons, ran ahead and repeated the same process, was highly interesting though somewhat ludicrous.

The drill lasted nearly three hours, including stoppages for rest, a few moments each time, and although performed under a scorching sun, on the hot sand, and comprising a series of vigorous exercises, the men stood it well and attended to their business. The entire drill of which the corps is capable includes a large number of movements not touched upon for want of time, including the silent manual, charging on a street crowd, and other novel movements. The latter was tried in one of the western cities on their way here, and their assumed ferocity and horrid yells at the charge set even the military scattering helter-skelter.

IMPORTANT INFRINGEMENT CASE.

Just as we were going to press, we received the following telegraphic despatch:—

CLEVELAND, Ohio.

JULY 20.—*Obed Hussey, versus Whitely, Foster & Kelley.*—This was a bill in chancery filed, in Cincinnati, to restrain the defendants from infringing Hussey's patents. A motion for injunction was reserved for argument at Cleveland, and was heard before Judges McLean and Wilson. The court held, first, that Hussey's patents had heretofore been adjudged to be valid on a final hearing, and the defendants had shown no good grounds for impeaching them; secondly, that the machines of Whitely & Co. infringed Hussey's patents; and thirdly, that an injunction be ordered as prayed for.

To Messrs. MUNN & Co., New York City.

A COLUMN OF VARIETIES.

An alloy consisting of 10 parts cast iron, 10 of copper and 80 of zinc does not adhere to the mold in casting, and it is of a beautiful luster when filed and polished. The most fractious metals are melted first and the zinc last, in making it.

The greatest discoveries have been made in leaving the beaten tracks of science and going into the by-paths. Let inventors mark this sentiment well.

Polished surfaces of steel and iron may be prevented from rusting, by exposure to water, if they are coated over with a mixture of lime and oil.

A transparent cement for glass is made by dissolving one part of india-rubber in chloroform and adding 16 parts, by measure, of gum mastic in powder. Digest for two days, and frequently shake the vessel in which these substances are contained. The cement is applied with a fine camel's-hair brush.

In a pumping engine there are two classes of work performed, namely, *useful* and *lost;* and the two, added together, make the *gross* work of the engine. The useful work in a given time is the product of the weight of water lifted in that time multiplied by the hight to which it is elevated; the lost work is that performed in overcoming the friction of the water in the pump, pipes, valves and piston.

A "combustible" means some simple or compound substance which is capable of combining rapidly with oxygen to produce heat. There are many combustible substances, such as phosphorus, sulphur, &c., but the most common are carbon and hydrogen, and these are found in nature intimately combined and on a large scale. The trees of the forest, the bituminous coal fields, and the fat of animals are principally composed of carbon and hydrogen.

An excellent furniture polish is made with one pint of linseed oil and about half a gill of alcohol, stirred well together and applied to the furniture with a linen rag. After this, it is rubbed dry with a soft cotton cloth and finished by rubbing with an old piece of silk, when a most beautiful gloss on the furniture will be result.

When the glass case which covers the magnet of a compass becomes electrified, it affects the needle. This deflection can be remedied by damping the glass with water, the moisture removing the electricity.

The speed to which the steamship *Persia* attained on her first trial trip, in 1856, was $16\frac{1}{2}$ knots per hour. Her engines have cylinders of $100\frac{1}{2}$ inches diameter and 10 feet stroke; her wheels are 38 feet 9 inches in diameter and make about 18 revolutions per minute. Her consumption of coal was, formerly, from 120 to 150 tuns daily, but she has just had an apparatus for superheating the steam applied, and by this it is expected that from 25 to 35 per cent of fuel will be saved.

One great cause of *mysterious* boiler explosions, we believe, is due to the inequalities of strength in the iron plates of which the boiler is constructed. The exact strength of a plate of iron cannot be ascertained without breaking it. Some plates of iron, of the same size and thickness as others manufactured from the same stock, have varied as much as 10,455 lbs., in breaking weight, to the inch, when tested.

The Electric Telegraph Company in London have an air-tight tube laid between their central station and other stations at Cornhill and the Stock Exchange, from which the air is exhausted by a pump and documents sent through the tube by atmospheric pressure, upon the same principle as Richardson's telegraph, which was illustrated on page 265, Vol. VIII. (old series), SCIENTIFIC AMERICAN. This system has been in operation, privately, in London, for several years, and it is now proposed to lay down a complete and extended series of public lines in London, on a scale which will receive not merely papers and packages, but parcels of considerable bulk, including the mail bags of the post-office between the railroads and the district offices; and a company is now in course of formation to carry out the object.

The new Commissioner of Patents, Gov. Thomas, desiring to infuse new life into the Agricultural department of his office, has sent out Col. Clemson to Europe to purchase good seeds suited to our climate and wants. Wheats, Italian barleys, &c., are to be special objects of acquirement. New and valuable seeds and plants are also to be obtained at any cost consistent with the appropriation of $60,000.

IMPROVED SEWING MACHINE.

The sewing machine has become an institution of the present age, and among the many labor-saving inventions almost daily introduced it stands pre-eminent as an article of household economy. Within a few years many thousands have been sold by different companies, and the great reduction of price has rapidly increased the demand. Simplicity, cheapness and practicability are the necessary requisites for a popular sewing machine. The "Moore double lock-stitch sewing machine" here illustrated combines these features most effectually and is sold at the reasonable price of thirty dollars. The peculiar features of this machine are the patent feed, so constructed as to support the cloth on every side of the cloth during the process of feeding, thereby preventing the cloth from drawing or "puckering," a fault with many machines, and the elastic jaws for forming the loops. These are clearly illustrated in Fig. 4.

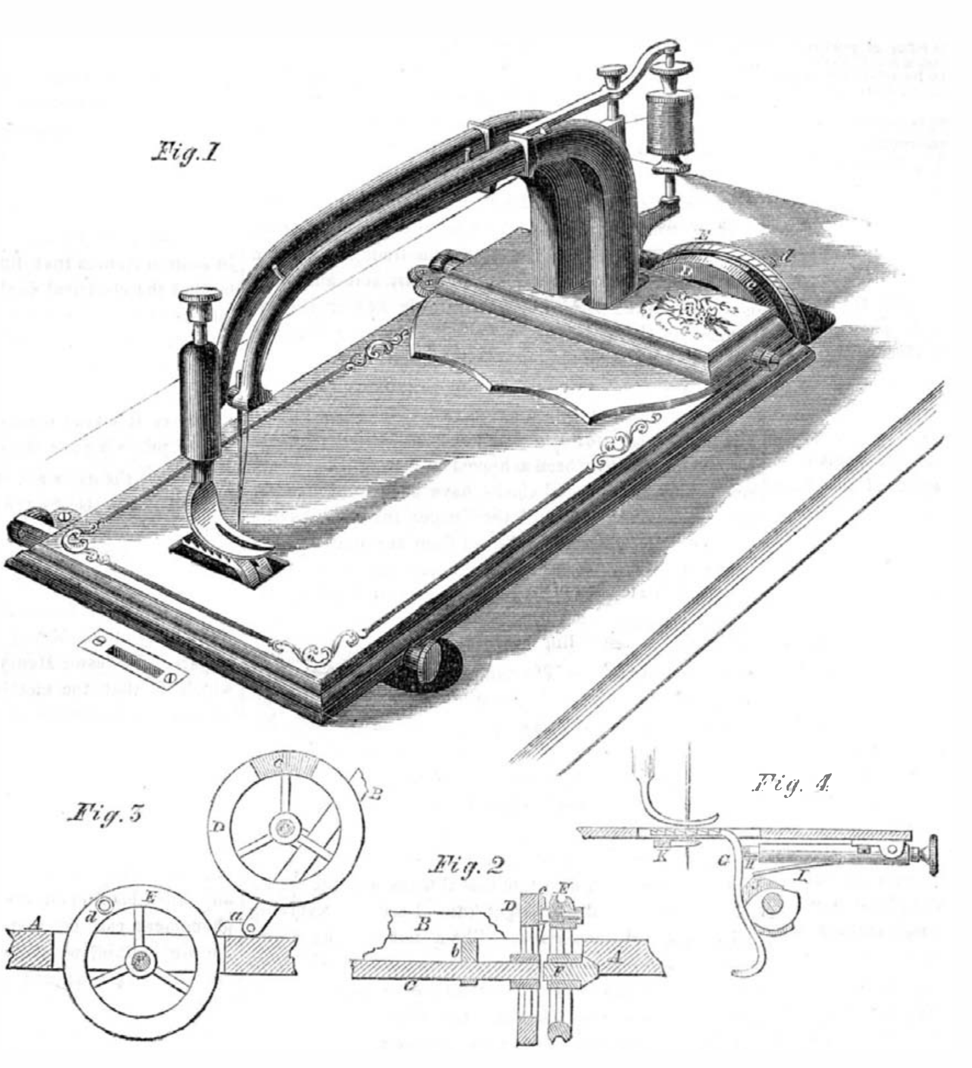
The feed ratchet, G, is made in one piece with the piston, H, and the case of this piston is attached to the frame of the machine by an axle, allowing it a slight oscillating motion. Secured to the same axle is the spring, I, which is operated upon by the cam, J, upon the main driving shaft. It will be seen that as the cam presses upon the spring the ratchet is forced upward, thus supporting the cloth while the needle is passing through it.

As the needle comes down through the table, it passes between the two soft, elastic, steel jaws, K, which are made exactly in the form of the jaws used by harness-makers. While the needle is still between them, the jaws are carried downward by a cam, and grasping the needle are opened by it, but close and seize the thread drawing open the loop, which is then entered by a pin and held for the succeeding stitch. The motions of this machine are all positive, and being strongly made, it does not seem liable to get out of order.

The attachment patented by Jonas Perkins April 17, 1860, is fully illustrated in Figs. 1, 2 and 3. Its principal object is to prevent the backward movement of the machine when, from carelessness or ignorance, the driving wheel is turned in the wrong direction, and it certainly accomplishes this object in a very simple and effectual manner. The driving pulley, E, and its shaft F, are entirely disconnected from the shaft, C, which carries the works. Upon the face of the pulley, D, on the end of the shaft, C, is formed a wedge-shaped projection, c, having a square shoulder at one end and inclining to a thin edge at the other. From the pulley, E, a pin, d, projects, which is pressed outward by a soft, spiral spring, bringing it in contact with the square projection, c, on the wheel, D, when the pulley, E, is turned in the right direction, and allowing the pin to recede and thus pass over the projection, c, when the pulley is turned in the opposite direction.

The carrying shaft being entirely disconnected from the pulley and treadle, the opportunity is afforded of placing the works upon a table separate from the main table, to which it may be hinged, so that it may be turned over and the works exposed in a most convenient manner, for oiling or repair. The position of the second table when turned is shown in Fig 3. This facility for inspection is a secondary but valuable feature.

By arrangement of the patentees, this attachment is applied only to the Moore machines, which are manufactured largely in Ohio, where they find extensive sale.



THE "MOORE" SEWING MACHINE.

Any further information can be obtained by addressing H C. Burtman, sole agent for the United States, No. 92 North Fourth-street, Cincinnati, Ohio.

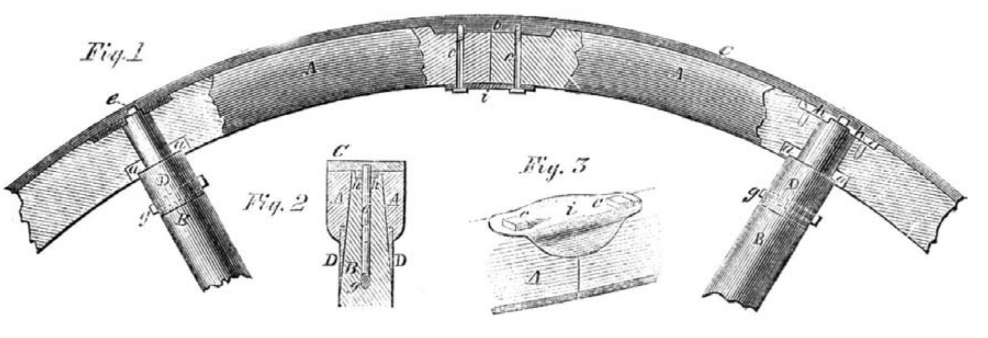
IMPROVEMENTS IN CARRIAGE WHEELS.

The nature of the invention illustrated by the accompanying figures consists in securing the spokes in the fellies of the wheel in such a manner that they will not be so liable to loosen, come off or break in the fellies, as by the usual mode of connecting them. The tire is also secured upon the wheel in a novel manner, obviating effectually its liability to slip off, and preserving its strength, which is liable to be impaired by drilling holes through the tire for the admission of bolts, according to the common practice. Plates are welded upon the inside of the tire to overlap the joints of the fellies. These have female screw threads cut into them for receiving the ends of the bolts that secure the fellies and tire together at these points, which make a very strong and durable wheel. In the engravings, similar letters on the figures refer to like parts.

A A represent the fellies of the wheel, B the spokes, and C the tire. The ends of the spokes for fitting into the mortises of the fellies are slightly tapered just behind the tenons, so as to fit very tightly into malleable cast iron ferules, D, which have a tapering bore so as to be flush with the surface of the spokes. These ferules have wings, *a a*, cast on either side, and exactly opposite each other. They are sunk into the fellies with the tenons of the spokes as shown by Figs. 1 and 2. These wings, *a a*, assist in giving strength and stiffness to those portions of the spokes which enter the fellies; especially if rivets are placed through the fellies on both sides of their tenon holes to keep them from splitting open, which should be done in all light vehicles intended for hard service. As many short grooves, of a suitable width and depth, are made in the inner face of the tire as there are spokes in the wheel, and each groove corresponds with the hole made in the axis of the spoke. The hole in the end of the spoke passes down to a lateral oblong perforation through the ferule, D, and receives a pin, *e*, the length of which is equal to that of the hole in the spoke, including the depth of the lateral hole above-mentioned, with a notch in its end nearest the hub of the wheel so that after the tire is on the wheel, this bolt, *e*, will just reach down to the bottom of its groove in the tire, in which position it is firmly kept in place by the bolt, *g*, after having been wedged down by a suitable tool. After the bolt, *g*, has been inserted, and the bolt, *e*, forced into its groove in the tire, the ends of the key are filed off even with the ferule.

To prevent the bolts, *e*, from vibrating and working loose in the spoke, the iron plates, *h*, are let into the tire in the face of the fellies and across the ends of the spoke tenons, and they are secured by screws which have perforations through them corresponding to the diameter of the bolts, *e*. The bolts pass through these plates before entering their grooves in the tire. These devices and their arrangement, as described, completely prevent the movement of the spokes or tire laterally or sidewise, as they are otherwise liable to do in consequence of the shrinkage of the wood in the wheel.

The usual manner of "setting" the tire on a wheel is by inserting screw bolts through holes in it at certain intervals apart. These pass into the fellies, and their heads are fitted into countersunk receptacles in the tire. They are also usually secured on the inside of the fellies with nuts. When the tire is ground down considerably by use, the heads of the bolts are usually worn off, then the bolts become loose, and the tire itself—particularly in carriages which run over paved streets—is liable to break at the bolt holes. These evils are obviated by this improvement. Plates, *b* (Fig. 1), are welded to the inner face of the tire at the joints. These fit in corresponding cavities made in the face of the fellies over the joints, and holes are cut through them. These holes correspond with holes made through the fellies for receiving the bolts, *c*, which have square heads, and they have also washers, *i*.



SCHELLY'S IMPROVED CARRIAGE WHEEL.

By this method of construction and fastening, the tire is secured to the wheel without being drilled or requiring bolts passing through it. It renders the wheel much stronger and more durable for all purposes, and its merits deserve general appreciation.

A patent was issued to Joel Y. Schelly for the above invention, on Dec. 13, 1859; and more information may be obtained respecting it by addressing the patentee, at Hereford, Pa.

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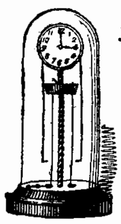
VOL. III., No. 5......[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, JULY 28, 1860.

NEW AMERICAN CLOCKS.



IN connection with this interesting subject, it is our intention to present some new facts which, we conceive, will be of benefit to our country if acted upon with an enterprising spirit. As an introduction having a bearing upon this topic, it will be quite appropriate to our arrangement to give a brief history of some of the most wonderful clocks.

The remote ancients were unacquainted with clocks; their only means of keeping a record of daily time was by sun-dials and hour-glasses. The first clocks of which we have anything like an authentic account were moved by drops of falling water, and were known to the Greeks in the days of Demosthenes. The Arabs—now so degenerate—were at one period the most learned and skillful people in the world; and, as far back as the ninth century, it is recorded that the famous Caliph Haroun al Rashid—the hero of the "Arabian Nights' Entertainments"—sent to Charlemagne, the conqueror of Western Europe, a water-clock which astonished all France. It was so constructed that, whenever it struck the hour of 12, a number of small figures rode out on horse-back and paraded around the dial-plate, then entered their tents. When the art of clock-making was introduced and first practiced in Europe is not very clear; but the most extraordinary clock ever made is the one now in the Strasburgh Cathedral, manufactured in the 14th century. It is furnished with a celestial globe that exhibits the motion of the moon, earth and the planets; and it has a perpetual almanac, on which the days of the month are pointed out by a figure. The first quarter of each hour is also struck by the figure of a child with an apple, the second by a youth with an arrow, the third by a man with the tip of his staff, and the last by an old man with a crutch; and the full hour is then struck by a figure representing an angel, which opens a door and salutes the Virgin Mary. Near the first angel stands a second, which holds an hour-glass that is turned in its hand as soon as the hour ceases striking. In addition to these figures and movements, there is a golden cock, which, on the arrival of every successive hour, claps his wings, stretches forth his neck, and crows twice.

American mechanics early exhibited great skill and ingenuity in clock-making. Long prior to the Revolution, the very distinguished David Rittenhouse, of Philadelphia, constructed an astronomical clock that exhibited several of the motions of the heavenly bodies; and it gained for him the highest consideration, both at home and abroad. It was presented to the college at Princeton, N. J., and for many years it was an object of wonder and admiration. The British army when they invaded that seat of learning—to their credit be it spoken—sacredly protected this contribution of American ingenuity, as was also the case with the Patent Office in Washington. It has long since ceased to perform its regular avocations, but its fame belongs to the history of our country, and will be perpetuated.

The colony of Connecticut early became somewhat noted for its steady, clock-going habits; and let it not be forgotten that John Fitch, the inventor of steamboats, was, by trade, a clock-maker. So well has Connecticut improved upon her early propensities that it may be justly asserted that no equal space on the globe produces so large a number of clocks at the present day; and here is the point to which we wish to divert from the historical to the commercial and mechanical views of the question.

Nearly all the clocks manufactured in this country are of a very common character, and there has not been a new principle of action added to them in a hundred years. A number of improvements have been made in several of their parts; but no very original mode of action has been applied. Besides this, most of our American parlor-clocks are what may be styled "common;" almost all the superior fancy qualities are still imported from France. We surpass the English in making clocks, but the French surpass us in beauty of design, if not in accuracy of workmanship. The London *Mechanics' Magazine* states that, during the year 1859, nearly a quarter of a million of clocks were imported from France into England. Now, if our clock-makers made more beautiful and cheaper clocks than the French, we should have all this trade in our own hands, and this would amount to a vast sum annually. Can we not do it? There is nothing new in the arrangement of the parts of a French clock; the Parisian makers have long sought for some original mode of action whereby they might be able to produce more new designs and introduce a greater variety; but they have always failed. But what has not been accomplished in France has recently been achieved in New York. Three small and neat mantel clocks have been exhibited for some time at the office of the Cooper Institute, having a principle of operation different from any that we have ever heard of, or seen. The common mantel clock is operated by the tension of an unwinding steel spring, like that of a watch; other clocks are operated by gravity in the form of a descending weight, the gradual fall of which is regulated by a pendulum. The new American clock (which is the invention of James Tuerlingx, of this city) has no operating spring, cord, pulley or pendulum. In the center of a common mantel clock vase, there is a vertical fixed steel screw extending from top to bottom. Over this is slipped a round weight with a hole in its center, but no thread cut on it. On the upper surface of this weight is a small roller, set on edge, and placed at such an angle that it takes into the thread of the screw, and the weight thus descends, revolving slowly around the screw rod, like a nut moving round by its own weight—a principle of mechanism which we have never seen carried out before in any machine. This is its principle of action; the revolving weight descends in a circuit of its own diameter. Two guide rods are attached to the descending weight, on the feet of which is the large wheel that is regulated by the escapement. It has only one wheel to connect it with the escapement and regulator, which are otherwise similar to those of a compensation chronometer. On the top of the guide rods, the motions are given to the hands of three dials by a train of gears. The length of time in which a clock is kept moving is regulated by the length of the screw, which is 14 inches for an eight-day clock, having 14 threads to the inch. We have thought that, from the very novel mode of operation embraced in these clocks, they are eminently adapted to take the place of those fancy clocks which are so extensively imported; they have attracted much attention from those who are curious in ingenious mechanism, and they may lead to the introduction of an entirely new class of American clocks.

OUR FRIENDS.—The friends of the SCIENTIFIC AMERICAN throughout the whole country have, as the politicians would say, "nobly rallied to our standard," and we take this occasion to extend to them, one and all, our warmest thanks. There are many little incidents connected with the renewal of subscriptions, which are exceedingly pleasant to us; and but for want of space, we should like to publish them. We cannot, however, forbear to mention the fact that the city of Louisville (Ky.) continues to bear off the palm; for some years past, our friends—the Messrs. Skene, of that city—have regularly obtained for us over one hundred subscribers. One appreciative subscriber—John May, residing in Yazoo City, Miss.—has just renewed his subscription, and *paid in advance for twelve years and a half!* In short, from all sections we are receiving satisfactory evidence of the value and popularity of the SCIENTIFIC AMERICAN. We hope our friends will not relax the canvass; but carry it on with enthusiasm and vigor.

ATMOSPHERIC ELECTRICITY.

The Newark *Mercury* having published a correspondence which recently took place between Seth Boyden, Esq., and the editors of this journal, in regard to certain electrical phenomena, we are induced to devote some more particular attention to the subject, with the hope of preventing the adoption or continuance of many erroneous notions in relation to it.

And, first, we entirely dissent from Mr. Boyden's theory that, in thunder-storms, the lightning never descends from the clouds to the earth, but always passes upwards from the earth to the clouds. This is contrary to the generally-received opinion, and contrary, we believe, to the unmistakable evidence of our own senses. It is true that, in most cases, the velocity of an electrical discharge is such that it is difficult, and perhaps impossible, for the eye to determine with certainty whether it is passing in the one or in the other direction; still, in some instances that difficulty does not exist. It may be that the electrical discharge is not always downwards, but, certainly, it is not always in the contrary direction. At all events, when it is impossible to say that the lightning passes downwards, it is equally impossible to say, from observation, that it passes upwards; and where a theory of this kind is sought to be established, the burden of proof is upon the theorist.

But this theory is not only disproved by common observation, but also by the deductions of science. This subject is pretty fully discussed in an article found in the Patent Office Report for the year 1859, from the pen of Professor Henry, of the Smithsonian Institute—a name which is foremost among the men of science in this or any other country, especially upon this particular subject. Professor Henry adopts the theory of Peltier, which is that the electrical phenomena of the atmosphere are entirely due to the induction of the earth, the electricity of which is constantly negative. Now it is true that the terms positive and negative are, to some extent, arbitrary and conventional, and most of the electrical phenomena can be equally well explained upon the theory of two kinds of electricity—the vitrious and the resinous; still, the scientific world has generally fallen back upon the idea of Franklin, that all the phenomena can be best explained upon the theory of one single fluid, which, when in excess or in deficiency, operates like heat and cold in producing their different effects.

Now a thunder cloud, saturated with moisture, is a tolerably good conductor of electricity, and when suspended over the earth, which is in a state of negative electricity, the lower portion of the cloud will become positive and the upper negative, in accordance with the well-known laws of induction. We might, therefore, expect that, in all cases, the discharge would be downwards.

The terms "positive" and "negative" are merely relative, like those of heat and cold; as there is no body, however cold, which is entirely destitute of heat, and which is not a warm body as compared with one which is still colder; so there is no body, how strong soever its degree of negative electricity, which is entirely destitute of that fluid, and which is not positively electrical when brought nearly in contact with another body still more negative. It follows from this that, although the earth is negatively electrical, it will be positive in regard to a cloud which, from any cause, may have become still more highly negative. Whether such a phenomenon may not sometimes present itself, we are not prepared to say; and, therefore, cannot deny that discharges may sometimes take place from the earth to the clouds. But we are fully of the opinion that the discharges are generally made in the opposite direction.

But why, if the electricity of the clouds is positive, does it not all pass to the earth in the course of a few minutes upon the rain-drops which sometimes fall so plentifully, or by means of the powerful discharges which often follow each other in such quick succession? Doubtless such would be the case were there not some means of replenishing the supply. But in all thunder storms, causes are constantly at work which develope electricity more rapidly than it can be carried down to the earth upon the falling drops. It, therefore, accumulates in the clouds until the mutual attraction between it and the negatively electrified earth causes it to burst its way through the intervening atmosphere, which is partially a non-conductor, and an explosion is the consequence.

The cardinal mistake with our friend, Mr. Boyden, seems to be in his regarding electricity as though it were an ordinary material substance, which might be brought down to the earth on rain-drops until it was entirely exhausted in the clouds. As well might he talk of exhausting all the heat of the clouds in the same manner. As far as we know, electricity, like heat, pervades all nature wherever there is a material substance to which it may attach itself. Whether it exists in void space, we have no means of determining.

Like heat, also, its tendency is to diffuse itself, and to become everywhere equalized. It rises from the earth with the vapor which subsequently forms the rain-cloud. If nothing takes place in that cloud to give it any new development or to disturb its equilibrum, it falls to the earth silently with the drops of the shower, still preserving its proportion to the mass of matter to which it is attached.

But, in some unascertained way, its quantity is increased in the storm-cloud and the general equilibrium is destroyed, and, when sufficiently accumulated, it bursts its way through the intervening atmosphere towards the earth or some other cloud whose electricity is negative in relation to its own, and a disruptive discharge is the result.

And now comes in the office of the lightning-conductor. To say that such a conductor exerted no influence at all upon the descending discharge, would be saying, in effect, that such a conductor was of no use at all; for if the rod only conveys to the earth the bolt which would otherwise have struck on the very point where the rod is located, it would be necessary to cover building with metal in order to ward off the lightning, just as completely as it needs to be covered in order to keep out the rain or the snow.

This may be said, however, in regard to lightning-rods. They do not cause a disruptive discharge when one would not have been made if the rod had not been erected; but if such a discharge would otherwise have fallen within a circle, the diameter of which is four times the hight of the rod, it is attracted to the conductor and passes harmlessly into the earth. Its attraction may even extend beyond that limit; but experience has shown that its efficacy cannot be relied upon at a greater distance, and, consequently, its protective power is limited by that rule. Suppose, then, a vertical cone, with its apex at the point of the conductor, and having for its base a circle whose diameter is four times the hight of the cone; the conductor will attract to itself any discharge which would otherwise have struck upon any point beneath the surface of that cone, and will consequently protect every such point; but nothing more, with any reliable certainty.

It is evidently a mistaken notion that there is any special attraction in the metal itself. A cast-iron pavement would attract the lightning no farther than though it were of brick. A pile of cannon balls would be as harmless as a cart load of pumpkins, as to its tendency to invite a visit from the electric messenger.

Nor does a lightning-rod possess much efficacy unless its electricity communicates freely with that of the earth. When a highly-charged thunder-cloud is impending over any particular point, the positive electricity beneath it is expelled to a distance. If a lightning-rod were standing there, so arranged as to be electrically disconnected from the earth, its own electricity would be decomposed; its lower extremity would be positive and its upper negative. But the intensity of that negative electricity would be slight, in comparison with what it would have been had the electricity of the rod been enabled to pass freely into the earth, and its attraction to the descending discharge would be weaker in the same proportion. And even after the lightning shall have struck such a rod, if there is any better conductor from any point of the rod to the great reservoir of negative electricity—the earth—than is formed by following the earth farther down, it will leave the rod at that point, and take the more attractive route.

This accounts for the fact that buildings are sometimes struck by lightning, though protected with conductors, just as roofs fail to furnish protection against rain if not properly shingled. But while the rod is so arranged that it shall furnish the readiest electrical access to the earth, the lightning will no more leave the rod and pass through the building than the water will leave the gutters and flow upwards to and through the roof. The laws of electrical action are as unvarying and reliable as those of gravitation.

It follows, from what has been said, that the glass insulators generally used in supporting lightning-rods are wholly useless and unnecessary, provided the rods themselves are properly constructed and their connection with the electricity of the earth is complete. The lightning will never leave the rod to follow an iron staple into the building, unless in that way it finds a better conductor all the way to the earth's electricity than that furnished by the rod itself.

POLYTECHNIC COLLEGE COMMENCEMENT.

The annual "commencement" of the Polytechnic College was held on Thursday evening, June 28th, in the lecture room of the building on Penn Square, Philadelphia. The exercises consisted of the reading of an inaugural thesis by Mr. Charles G. Willcox, of the graduating class; an address by Dr. A. L Kennedy, President of the Faculty, and the conferring of the degrees of the college, by Matthew Newkirk, Esq., President of the Board of Trustees, upon the following gentlemen:—

Bachelors of Mechanical Engineering—Charles G. Willcox, Philadelphia; Edward S. Colwell, of Philadelphia.

Bachelors of Civil Engineering—Frank J. Firth, Germantown; Charles M. Burchard, Philadelphia; H. Harlan Carter, Texas (Lancaster county).

The Master's degree was conferred upon the following graduates of three years' standing:—

Master of Mine Engineering—Charles W. Bodey, of Norristown, Pa.

Master of Mechanical Engineering—Robert Scott, Jr., of Philadelphia.

The following are the subject of the theses presented by the candidates for graduation:—

Mr. Willcox:—Iron-works; their location, arrangement and construction, illustrated by plans and drawings. Mr. Colwell:—Plans and description of a hot-blast furnace, with a pneumatic lift and the means of using the waste gases. Mr. Burchard:—Plans and description of a single arch iron truss bridge. Mr. Carter:—Glass: its history, composition and manufacture. Mr. Firth:—Description and plans of a three-arch cast-iron bridge.

The success of an institution which thus professionally educates young men for the practice of those great scientific and industrial pursuits upon which the prosperity of our country depends, and which are among the most honorable and lucrative of human employments, is a subject of general congratulation. We have carefully examined the thesis of Mr. Willcox, and shall soon present it to our readers, with the engraved plans on an extensive scale. It is a subject which will interest many of our readers.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

SILK STRETCHING AND STEAMING MACHINE.

The object of this invention is to obtain a simple, compact, and portable silk-stretching and steaming machine, the manipulation of which will be simple, while the power may be increased or diminished at pleasure. This invention consists in suitably combining with a stretching and steaming box, wherein the hanks of silk are placed to be stretched, a cylinder enclosing a piston which is to be operated by steam or hydrostatic power for giving a direct action upon the stretching bars over which the hanks of silk are placed, and thus perform the operation of stretching and steaming at the same time. The inventor of this improvement is Lucius Dimock, of Hebron, Conn.

ANATOMICAL LAST.

This invention is an improvement in constructing lasts for boots and shoes, so that shoes produced from these lasts will correspond to the bones and ligamentous structure and conformation of the sole, back, and heel of the natural foot; the invention provides for preventing distortions and deformities of the foot, or joints of the foot, callouses upon the toes, and for relieving and correcting such dislocations where they already exist. This improvement was designed by John C. Plumer, of Portland, Maine.

INDUSTRY—MANUFACTURES—COMMERCE.

The Great Eastern.—The number of visitors to this great vessel has increased steadily from the day the price of admission was reduced to 50 cents. About 10,000 have been admitted daily during the past week. It is her great mass that produces such an influence upon the mind; the funnels of small steamers which come alongside reach only to her bulwarks. The vast unoccupied space inside gives the vessel an empty appearance; and there is certainly an unfinished look about most of the apartments. There is no no grand, spacious upper saloon, like those on most of our steamships, to show-off her capacities and accommodations for passengers. It seems to be too much cut-up into separate apartments by the bulkheads being carried up so high above the water line. Giffard's feed apparatus is attached to the boilers of the paddle engines. It consists of a jet of steam carried through a narrow nozzle into an open, trumpet-mouthed tube, situated below the water line in the boiler. At the entrance of this tube, it meets with the column of feed-water, and the steam rushes into the boiler, carrying some feed-water with it. It answers very well when feeding with cold water, but not when the water is taken from the condenser in which a portion of air is set free, which retracts the necessary vacuum for this feeder. No pump whatever is required for this apparatus; it is a French invention, and is both simple and novel, and for locomotives it is beginning to be extensively applied in England. In comparing the size of the parts of the paddle-wheel engines of the *Great Eastern* with some of those on our American steamers —such as the *Adriatic*—we have been impressed with their apparent *lightness.* Thus: the shaft of the *Great Eastern* is only 24 inches in diameter; while that of the *Adriatic* is 26 inches. The piston rods, connecting rods and valve rods also appear to be very slender in proportion for such a large ship. Each paddle float on the wheel is 13 feet long and 3 feet broad; the circumference of the wheel is 150 feet. The dip of the wheels were four feet on the voyage out, but the floats were reefed-up some distance from the extremities of the arms. One thousand tuns causes a displacement of only six inches; 10,000 tuns will only sink her five feet deeper in the water. There are no less than 33 engines on board—such as donkey engines for feeding boilers, hoisting, &c.—thus making 25 for minor operations; the eight large engines being employed for propelling. Each oscillating cylinder, with its piston rod, weighs 26 tuns; thus making 104 tuns for the four cylinders. On Monday next—the 30th—the *Great Eastern* will proceed on the grandest marine excursion that has ever taken place on our waters. She will take several thousand passengers, at $10 a head, and proceed to Cape May, where she will meet with a large delegation of Philadelphians; thence she will steam down to Cape Hatteras, and return to New York on Wednesday. A splendid band of musicians has been employed for the occasion, and a *grand time* is anticipated. It is now concluded, we understand, that she will leave to return to England on the 16th of next month; therefore, all those at a distance who desire to visit her should do so at the earliest date.

Steam Plow.—The State Agricultural Society of Illinois offers a premium of $1,000 for the best steam engine that can be practically substituted for animal power in plowing and other farm work. This prize is simply for a farm locomotive which may be applied to do general work. It is expected that several of such engines will be entered for competition this year. Much dissatisfaction has been felt, heretofore, with the action of the committee of this society in not awarding the full prizes at the former exhibitions of Fawkes' plow. We hope no cause for such blame will be allowed to rest on the Committee on Premiums at the next fair.

The law has gone into force in this city forbidding any person to sell or give any poisonous substance without making a record of it in a book, taking the name and residence of the person to whom it was given, and the name and residence of a witness to the sale. This good act is applicable to all cities in New York State. The penalty for disobeying it is $50 in each case.

Darius Davidson has published a long article in the New York *World*, condemning the model and build of the *Great Eastern.* His views on the subject belong rather to the speculative than the positive in science.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JULY 17, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

, Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

29,132.—J. N. Arvin and S H. Perkins, of Valparaiso, Ind., for an Improvement in Setting Axle-trees:

We claim an improved mode of setting axle-trees and giving them the required pitch and "gather," by means of metallic set screws, rests and sets, or their equivalents, as exhibited and described by the specification.

29,133.—Samuel Barnett, of Washington, Ga., for an Improved Plotting Instrument:

I claim the instrument, constructed essentially as described and represented, combining a protractor, graduated rule and T-square, arranged in such a way that the adjustment of the protractor adjusts the rule.

[This invention combines, in a very simple way, a protractor, graduated rule and T-square, in one and the same instrument, by a simple adjustment of which both the direction and length of any given line can be readily and accurately obtained without calculations.]

29,134.—G. T. Bennett, of Mt. Olive, N. C., for an Improvement in Seed Planters:

I claim the arrangement of the slide, C, hand lever, b, standard, d, and the wheel, B, provided with the pin, i, in combination with the cultivator, constructed substantially as and for the purpose set forth.

29,135.—C. A. Boynton, of Hyde Park, Vt., for an Improved Butter-worker:

I claim attaching a tub to receive the butter to a rotary disk, B, in combination with the conical pressing roller, K, arranged and operated substantially as described and to obtain the described results.

[This invention consists in the combination of an adjustable clamp for holding the pails, with a horizontal disk spur wheel and a pinion evel spur wheel and crank, for giving to the tub or disk wheel a rotary motion; and in arranging over this disk wheel, in a suitable manner, a conical pressing or packing roller that is made to act upon the top of the butter when put into the tub, by a hand lever, so as to forcibly pack the butter down in the tub, and, if necessary, print or stamp the surface of the butter in the tub at one and the same operation of pressing.]

29,136.—Ephraim Briggs, of Medina, Ohio, for an Improvement in Cultivators:

I claim the arrangement of the main beam, A, and the side beams or wings, C C, the posts, D D D D, the shovels, E E E E, bars, F F F F, bolts, G G G G G, changeable braces, H H, handles, I I, and round, K, in manner and for the purpose set forth.

29,137.—Wm. A. Brown, of Philadelphia, Pa., for an Improvement in Couches for Railroad Cars:

I claim supporting the couch by supports, G, drawn from the side of the car, when used in combination with the posts, H, substantially as described.

29,138.—George Churchill, of Hartford, Conn., for an Improvement in Spool Pins for Sewing Machines:

I claim the revolving conical spring tube, E, in combination with the taper or conical-shaped pin A, in the manner and for the purpose substantially as set forth and described.

29,139.—E. B. Clark, of Tallahassee, Fla., for an Improvement in Plows:

I claim the arrangement of the adjustable diagonal bar, E, swinging foot, G, swinging bar, D, horizontally and vertically-moving sole, F, and beam, A, as and for the purpose shown and described.

[This invention relates to an improvement in that class of plows which are designed for having different kinds of shares attached, according to the nature of the work to be done. The object of this invention is to obtain an adjustable foot, so that a greater or less inclination may be readily given the shares, as may be required, without changing the position of the landside from a horizontal line; different shares requiring a different set or inclination, according to their construction or form.]

29,140.—D. J. Cochran, of Centerville, Ind., for an Improvement in Compounds for Tanning:

I claim the employment of the within-named ingredients, compounded in substantially the proportions specified, for the purpose of making a tanning liquor, as fully set forth.

29,141.—Eleazer Coffin, of Indianapolis, Ind., for an Improved Mortising Machine:

I claim the cutter and clearer, H, cutter-holder, I, adjustable hinged table, O, crank, K, and screw, U, when connected and operated, in connection with the end-cutting chisel, R, holder, A, lever, B, pitman, C, lever, D, and the rests, F F and G, or their equivalents, as set forth.

29,142.—George Collyer and Hamilton Patterson, of Philadelphia, Pa., for an Improvement in Couplings for City Railroad Cars:

We claim, first, Constructing the enlargement, d, of the pole with a beveled face, in the manner and for the purpose substantially as set forth.

Second, Giving the tumbler, B, a rounded form at the end, in the manner and for the purpose substantially as set forth.

Third, The extension, a, having an eye, b, for joining the box to the car.

29,143.—James Connell, of Port Huron, Mich., for an Improvement in the Preparation of Tanning Extracts:

I claim the process of manufacturing the aqueous extracts of the tanning principles contained in trees and shrubs, by concentrating the extract by evaporation, and then mingling with it a desiccated pulverized vegetable fiber containing the principles of the extract.

29,144.—Joseph Corduan, of Brooklyn, N. Y., for a Mode of Coating Type-metal with Brass:

I claim the solution, composed of the ingredients and prepared and mixed together, as described, for the purpose of plating or coating the faces of printers' type, made of type-metal, with brass, in a manner more hard, smooth and durable, and with greater economy, than has heretofore been attained.

I also claim, in connection and combination with the above, the using of a brass vat for containing the solution, to be connected with the positive pole of the battery, instead of having a separate plate of brass for that purpose.

29,145.—H. J. Coster, of Chicago, Ill., for an Improvement in Flower Stands:

I claim the combination of the different parts described; that is to say, the flower-stand proper, A, the heating apparatus, C, in combination with the movable cover, B, weight, F, cord, g, pulleys, P, or their equivalents, and outer case or bureau, G, all arranged substantially as and for the purpose set forth.

29,146.—Lucius Dimock, of Hebron, Conn., for an Improvement in Machines for Stretching Silk in the Hank:

I claim the combination, with a steaming and stretching box for stretching hanks of silk, of the cylinder and piston, whereby a direct application of power may be obtained in a simple and compact manner, essentially as described.

29,147.—T. H. Dodge, of Washington, D. C., for an Improvement in Cotton Cultivators

I claim, first, In combination with a plow or cultivator, the self-adjusting rotary shield, F, arranged to protect the young plants, as described, and as shown in Fig. 1.

Second, I claim, in combination with the plow or cultivator, the self-adjusting guard coulter, H, and rotary shield, F, as and for the purposes set forth.

29,148.—James Doty, Jr., of West Falls, N. Y., for an Improved Mop Head:

I claim the lever, b, and staff, A, in combination with roller, a, and link, d, substantially as and for the purpose specified.

29,149.—J. W. Durham, of Durhamville, Tenn., for an Improved Engine for employing Steam or other Aeriform or Gaseous Body under Pressure to obtain Motive Power:

I claim an engine, composed of an endless chain of buckets, arranged within a box of water, with suitable pipes or other means of ingress and egress to and from the said box; the whole being constructed, arranged and combined so as to produce an operation substantially as described.

[This invention consists in an upright endless chain of buckets arranged within a suitable box, which is filled with water to a suitable level, and to which steam or other gaseous or aeriform body, at pressure greater than the atmosphere, is introduced by a pipe or pipes in such a manner as to enter the buckets below the surface of the water, and to displace the water therefrom, and to give motion to the chain of buckets by its tendency to rise to the surface of the water.]

29,150.—Adam Ernst and C. Shepard, of Milwaukie, Wis., for an Improvement in Hot-air Furnaces:

We claim combining the flues of a furnace, surrounded by double walls, with collars, S, and covers, R U W V, substantially as and for the purposes described.

29,151.—C. J. Ferguson, of New York City, for an Improved Clothes Frame:

I claim the combination, with the reel, of the revolving slats, the cog wheel, G, and endless screw or worm, H, arranged and operating together in the manner and for the purpose specified.

29,152.—August Friedrich and Conrad Walter, of New York City, for an Improvement in Tobacco Boxes.

We claim the combination of the vertical plate, b, and spring, a, with the segment-shaped bow, e c' g, substantially in the manner and for the purpose described.

29,153.—J. U. Fiester, of Winchester, Ohio, for an Improvement in Shovels:

I claim the lever-hinged shovel, constructed and operating as described and for the purposes set forth.

29,154.—C. J. Fisher, of Wawkou, Iowa, for an Improvement in Horse Collars:

I claim the combination of the curved and pivoted hames, E E, having their ends connected at F, and provided with socket joints, G, with the divided collar, A A, in the manner and for the purpose substantially as shown and described.

[The object of this invention is to obtain a horse collar that may be adjusted to suit horses of various sizes, and also one that will be better calculated than usual to transmit the power of the animal to the load or vehicle without injuring the horse by friction, as well as fatiguing the same.]

29,155.—J. H. Fisher, of Placerville, Cal., for an Improvement in Fastening the Handle to Picks and other Tools:

I claim the combination, with a handle which extends partly into the eye of the pick, and has a socket in its rear end and two shouldered spring straps at its sides, of a portable wedge constructed with a tongue and a gib, and a key seat or slot.

29,156.—H. C. Foote, of McGaheysville, Va., for an Improved Pocket Calendar:

I claim the calendar composed of the three perforated plates, A A' and B, held in place by a split ring, or its substitute, as and for the purposes set forth.

[This invention consists in dividing one side of two circular plates, of any suitable diameter, into spaces by suitably engraved or raised lines radiating from the center of the plates, so that the spaces on one side of one plate will indicate the days of the week, and the spaces on the other plate will indicate the twelve months and the number of days in each month; these two plates, with a star-shaped plate, having the days of the month arranged on its surface, are put together by a central pivot, so that each plate will be capable of rotating about its axis, and the plates are to be secured in any desired position by a split ring.]

29,157.—M. J. Gallager, of Savannah, Ga., for an Improvement in Breech-loading Fire-arms:

I claim, in combination with a breech-loading gun, in which the cartridge chamber is divided at or near its middle, and a lever and link connection for sliding and tipping the barrel, the slide piece, h, and guiding ways, g, and opening, k, or their substantial equivalents, for causing the barrel, when opening up the cartridge chamber, to move in a right line before it swings on its pivot, substantially in the manner and for the purpose described.

29,158.—Benjamin Garvey, of New York City, for an Improvement in the Manufacture of Bread:

I claim, first, The process described of employing atmospheric air, by exhaustion, to produce lightness in bread, cake, confectionery, &c., without the aid of ferments, chemicals or drugs of any kind.

Second, I claim the same process to insure the rising of bread, &c., under all circumstances, when ferments or chemicals are employed.

29,159.—John Gehr, of Clear Spring, Md., for an Improvement in Hominy Machines:

I claim the wheel, C, having spikes projecting from its side surfaces, and having its entire surface, spokes and all, serrated or ribbed, in the manner set forth, when the same is arranged within a drum, E, with spikes projecting from its sides inside; the whole being arranged in the manner and for the purposes set forth.

[This invention consists in the employment of a large wheel with a quadrangular rim, having its entire surface grooved or ribbed, and having projecting from its surfaces ribbed spikes that, with the wheel, when it is arranged in a large drum having spikes projecting from its inside side surfaces and rotated very rapidly, will thoroughly stir the hominy, and take off the outer shells by attrition or by the peculiar action the ribbed surfaces will have upon the broken grains. The wheel being arranged within a cylindrical box, having perforations in its bottom, the hulls, &c., will escape through these perforations, leaving the pure hominy in the box, from which it may be removed at any time.]

29,160.—Wm. Gowen, of Wausau, Wis., for an Improved Washing Machine:

I claim, first, The arrangement of the corrugated stationary wash-board, E, and the corrugated reciprocating spring rubber, F, in combination with the double crankshaft, f, hooks, h, and frame, A, of a table, constructed and operating substantially as and for the purpose specified.

Second, The combination with the crankshaft, f, and rubber-carrying frame, G, of the double rotary hook, H, substantially in the manner and for the purpose specified.

[This invention consists in arranging, on the interior of the frame of a table, a stationary corrugated wash-board, in combination with a corrugated reciprocating spring rubber, the latter being held down on the wash-board by means of oscillating hooks, and to be operated by a crankshaft in such a manner that, on removing the top of the table, the frame serves as a complete washing machine; and the invention consists, further, in combining with the crankshaft that serves to operate the rubber, a double rotary hook, for the purpose of wringing the clothes.]

29,161.—John C. Gregg, of Hillsboro', Ohio, for an Improvement in Grain Separators:

I claim the combination of screws, A B C, spiral conveyors, E E' E'', and apertures, d' b c c', substantially as and for the purposes set forth.

29,162.—Loure Green, of Great Bend, Pa., for an Improvement in Plows:

I claim the arrangement and combination of the moldboard, Z, share, Y, landside, Q, and standard, X; the whole being constructed as and for the purposes described.

29,163.—Asa Greenwood, of Toulon, Ill., for an Improved Clothes Frame:

I claim the combination and arrangement of two sets of radial arms, D D D E E E, and one set of parallel bars, F F F, together and with the pole, A, stationary cap, B, and slider, C, substantially as specified.

29,164.—Wm. D. Hall, of Hamden, Conn., for an Improvement in Fish Oils:

I claim, as an article of manufacture, an oil extracted from fish in the manner set forth.

29,165.—A. B. Harlan, of Ercildoun, Pa., for an Improved Washing Machine:

I claim the arrangement of the swinging beater, d, and pins, i i, when used in combination with the open revolving wheel provided with beveled slats, substantially as and for the purp se specified.

29,166.—J. A. Hartsfield, of Kinston, N. C., for an Improvement in Cotton Cultivators:

I claim the arrangement of A, the main frame; A' and A'', the cross bars; E and E', the scrapers; G, the gear wheel; C, the shaft; D, the chopper; F, the guide pole; H, the handles; B and B', the vertical posts; c and c', the slots; d', the slot in revolving shaft, a', the pinion gear wheel, and F', the bounds; the whole being constructed and combined as descr bed, for the purposes set forth.

29,167.—F. P. Keller and Elias Young, of Cincinnati, Ohio, for an Improvement in Air Furnaces:

We claim, first, The combination of the vertical diaphragms, c, with the drum, C, and tubes, G and G', operating in the manner and for the purposes set forth.

Second, The arrangement of the air reservoir, E, annular air and smoke chambers, a and k, and tubes, G G' G'', operating in the manner and for the purposes explained.

29,168.—Daniel Hemingway, of Covington, Ky., for an Improved Fire-place and Chimney:

I claim, first, The aperture in the back of fire-places to be closed by sliding doors, in combination with a cooking stove or range in the rear, substantially as and for the purposes specified.

Second, I claim the enlarged space on each side and above the mantel, as arranged, the contracted flue above, the metal plates in front, the partition in the top, and small outlets, all in combination as specified, for the purposes set forth.

29,169.—T. S. Heptinstall, of Mendota, Ill., for an Improvement in Gang Plows:

I claim the peculiar arrangement of the frame, A, plow, B, arms, F, with wheels attached, lever, C, with caster wheel on its lower end, connecting rod, H, lever, a, cur ed rack, i, and pinion, x, operated by means of crank handle, b, when the several parts are connected substantially as and for the purpose specified.

29,170.—J. S. Hickey, of Pike, Ill., for an Improvement in Grain-binders:

I claim, in combination with a binding mechanism arranged on the rear edge of the platform of a harvester and operated by hand, the vibrating lifter, R, and bifurcated foot lever, R' I, constructed, applied and operating as specified for the purpose set forth.

I also claim, in combination with the slotted pinion, L, and a slotted holder-bar, b, the vibrating shear, d d2, and hook, c, and actuating cam, m, and spring, e, when the whole is arranged to operate substantially as described, for the purpose set forth.

29,171.—James Hotchkiss, of Yellow Springs, Ohio, for an Improvement in Brick Machines:

I claim the combination and arrangement of the single spiral wing, H, and the double spiral wings, I I, turning in opposite directions and both producing a downward action, substantially in the manner and for the purposes specified.

29,172.—J. Y. Humphrey, of Philadelphia, Pa., for an Improved Mica Chimney for Lamps:

I claim the combination of the tapering cap, b, with the mica tube, A a, and metal ring or supports, c c' g g', as and for the purpose described.

[An illustration and description of this invention will be found on another page.]

29,173.—J. Y. Humphrey. Suspended.

29,174.—L. C. Ives, of Hartford, Conn., for an Improvement in Thread-polishing Machines:

I claim, first, A rotating, polishing surface composed of alternate brushes and rods, substantially as described, and this I claim, also, when an apparatus for heating either the rods or the brushes, or both of them, substantially such as specified, is combined with such a polishing surface.

Second, A rotating, polishing brush in combination with an apparatus substantially such as specified, for drying and heating the brushes and in combination with a size vat.

29,175.—Charles Jones, of Philadelphia, Pa., for an Improvement in Stoves:

I claim, as a new article of manufacture, a stove provided with a flue from the space below the grate to the space above the fire within the outside case of the stove, for the purpose specified.

29,176.—Hermann Kaller, of Perry, Ill., for an Improvement in Seeding Machines:

I claim the arrangement of the rods, f f, bars, K, distributing wheels, J, spouts, E, runners, H, levers, L M, caster wheel, N, and frames, A D, as and for the purpose shown and described.

[This invention relates to an improvement on a seeding machine for which Letters Patent were granted to the above inventor, bearing date Nov. 2, 1858. The object of the present invention is to facilitate and perfect the seed-dropping operation and also to render the shares capable of being more easily raised by the driver than hitherto.]

29,177.—Henry Kay, of Brooklyn, N. Y., and Thomas Avery, Jr., of Morrisania, N. Y., for an Improvement in Planishing Copper Vessels:

We claim the application of the screw, nuts and link, at described, to the head or heads in the interior of the work, for adjusting and controlling the position of the heads from the outside during the operation of planishing, riveting, &c., as set forth.

29,178.—L. D. Lane, of Freeport, Ill., for an Improved Governor Attachment to Grain Separators:

I claim, first, The employment or use of a governor, F, connected substantially as shown to slides, y y, fitted over the blast induction orifice, x, of the fan of a grain separator for the purpose set forth.

Second, Connecting, substantially as shown, with the governor, F, the link slide, h, fitted in the slotted bell crank, d, and arranged to operate as and for the purpose specified.

Third, Attaching the shaft, l, of the governor, F, to the platform, D, which is fitted on an axis and adjusted by screws, k, or their equivalents, for the purpose set forth.

[The object of this invention is to insure an uniform or constant blast from the fan of a grain-separating machine, so that all variation in the speed of the driving shaft will be compensated for, and the grain subjected to a uniform blast of sufficient power to separate the light foreign impurities from it. The invention has further for its object the giving to the shoe a variable shake motion or stroke corresponding inversely with the variable speed of the driving shaft, so as to insure a regular passage of the grain through the separator under varying degrees of speed of the driving shaft.]

29,179.—Thomas Langdon and Christian Weitman, of Hazleton, Iowa, for an Improved Broom:

We claim the combination of the T-piece, B, its rod, C, clamping plates, D D, cap, B, nut, a, with the handle, A, all relatively arranged in the manner set forth.

[This invention consists in the use of a screw iron of a T-shape, metal cap for the ends of the wisps of broom corn, two clamping plates between which the T-iron is interposed and a handle that secures the whole together.]

29,180.—John Lemman, of Cincinnati, Ohio, for an Improvement in Hoisting Apparatuses:

I claim, first, The pulleys, M K U, and the tension pulley, R, carried by the bar, S—all arranged and operating substantially as and for the purpose described.

Second, The system of gearing composed of gear wheels, G G H H I I, and racks, F F—all arranged and operating substantially as and for the purpose described.

29,181.—J. H. Lyon, of New York City, for an Improved Seal Lock for Railroad Cars:

I claim, first, The combination with the ends, c c, of shackle, A, of the soft metallic rivet, B, as and for the purpose shown and described.

Second, Beveling the ends, c c, of the shackle, A, as and for the purpose shown and described.

Third, Making the hole in the shackle which receives the fastening rivet of conical or beveled form, so that, by the act of opening, the rivet cannot draw through the hole but will break in or about its middle, as and for the purpose shown and described.

[This invention relates to an improvement in those devices which are technically termed "seal locks," and are employed as a safeguard against dishonest employes. The invention is more especially designed to be applied to be applied to mail bags, railroad freight cars, and the like, but it may be applied in all cases where boxes, packages, &c., are intrusted to carriers or employes.]

29,182.—G. S. Manning, of Springfield, Ill., for an Improvement in Excavating Machines:

I claim, first, The spring moldboard for the purpose of allowing stones and other substances to pass between the plow and the bucket wheel, thus preventing choking the machine, substantially as set forth.

Second, The spring plate in combination with the wheel, A, substantially as set forth.

Third, The use of the wheel, B—the same being adjustable both vertically and laterally—the whole being arranged and operated substantially as set forth.

Fourth, The forked guides, K and S, in combination with the hinged moldboard, substantially as set forth.

29,183.—P. T. Mayne, of Keosauqua, Iowa, for an Improvement in Excavating and Grading Machines:

I claim, first, The combination of the hinged spade, c, hung to its central disks, e, with a wheel, the rim, a, of which is provided with stops, b, substantially as and for the purpose set forth.

Second, An angular frame, n, pivoted at one end and bearing with the other end upon the tongue, k, in combination with pulleys, q s t, and rope, p, substantially as and for the purposes set forth.

29,184.—M. C. McCullers, of Herndon, Ga., for an Improvement in Plows:

I claim securing the beam handles and moldboard together by means of the braces, C D, straps, d, and pins or bolts, 2 3—the whole being constructed, arranged and united substantially in the manner set forth and explained.

29,185.—T. McIntire, of Franklin Furnace, Ohio, for an Improvement in Cotton-bale Fastenings:

I claim the new article of manufacture herein described, to wit: a stiff metal tie plate for cotton-bale hoops, made with two T slots in it, a transverse stop bar, C, between the slots, and two vertical, square shoulders, a a, at the termination of the slots and below the underside of the bar, C, for use in combination with a cotton-bale hoop which has T-shaped ends—in the manner and for the purpose described.

29,186.—J. E. McNair and J. C. Elliott, of Augusta county, Va., for an Improvement in Railroad Gates:

We claim the arrangement of the curved levers, A A, connecting rods, E E, eccentrics, B B' B'', connecting rods, L, and levers, C C, with the gate which slides in grooves in the posts and which is provided with cords and pulleys for elevating it—when the several parts are connected and used substantially as and for the purpose set forth.

29,187.—L. C. Miner, of Hartford, Conn., for an Improvement in Attaching Thills to Vehicles:

I claim the projection on the bolt, D, and the arrangement and insertion of an elastic and compressible substance in the countersink of the jaw or jaws of the clip, A, all in combination in the manner substantially and for the purpose as set forth and described.

29,188.—T. J. Newland, of Wolcott, Vt., for an Improvement in Corn-shellers:

I claim the combination of the rigid angular frame with the stationary plate, P, movable plate, B, adjustable bearing piece, D, adjustable guide piece, C, adjustable hook, c, eye, b, in position described, spring, S, roller, r, when these parts are arranged for joint operation as and for the purpose set forth.

29,189.—John Raff, of Eden, N. Y., for an Improved Churn:

I claim the dashers, K and L, provided with inclined wings, l l, as described, secured one above the other loosely on the dasher rod, I, the connection with said dasher rod being effected by means of the grooves, m m, and pins, n n; the whole arranged, combined and operating substantially in the manner and for the purposes specified.

29,190.—Leonard Parker, of Winterset, Iowa, for an Improvement in Rat Traps:

I claim the combination of the transparent guards consisting of uprights, C, and glass, x, drop doors, b, and conducting tube, f, when used in connection with the ordinary rat trap; the whole being combined, arranged, constructed and operated in the manner described and for the purpose set forth.

29,191.—W. P. Penn, of Belleville, Ill., for an Improvement in Seeding Machines:

I claim the arrangement of the hook and cam bracket, Q, on the bar, P, and with the bracket, d, on the bar, I, to open and close the valves, b b, in the manner set forth.

29,192.—A. W. Porter, of St. Johnsville, Vt., for an Improved Metal Cap for Ax Helves:

I claim the head or cap for ax helves manufactured of metal or any suitable material and constructed as described, so as to be readily attached to the helve in the manner as set forth and specified.

29,193.—Ignaz Ramminger, of New York City, for an Improvement in Detachable Whiffle-trees for Vehicles:

I claim the use or employment of the rods, G G, provided with the right-handed (I) and left-handed (J) screw threads, in combination with the spring, O, strap, R, provided with handles, S, hub, L, and axle, B, when the same shall be arranged and operated in the manner described and for the purpose as set forth.

29,194.—S. G. Randall, of New Britain, Conn., for an Improvement in Hay Presses:

I claim the arrangement of the platen, O, and its double rock-bars, L L, with the sliding frame, K K, the actuating detents, e e, the driving shaft, R, the cam, g, and the retaining detents, e' e', substantially in the manner and for the purpose set forth.

I also claim the grooves, j j, in the upper and lower sides of the compressing box, in connection with the grooved angle blocks, i i, combined with the platen of the press, and the apertures, n, in said platen—all substantially as set forth.

29,195.—C. L. Rice, of Milwaukie, Wis., for an Improvement in Pumps for Locomotive Engines:

I claim, first, Constructing the valve chambers and air chambers of one piece, and arranging them in relation to each other as set forth.

Second, The crosspieces, x x, and the cap in connection with the projections, i i' i'' i''', constructed and arranged as and for the purposes described.

29,196.—Mark Rigell and W. D. Ivey, of Dawson, Ga., for an Improvement in Cotton Cultivators:

We claim the arrangement of the guard wheel, G, plate, H, adjusting rod, F, with the beam, A, and standard, E, as and for the purposes set forth.

29,197.—G. A. Rollins, of Nashua, N. H., for an Improved Machine for Crushing Stone:

I claim, first, The combination of the crushing chambers, E' E', with a central, vibrating, crushing block, for the purposes stated.

Second, The combination of the corrugated jaws, D' D', and adjusting screws f' f', with the central block, D, constructed and operating substantially as set forth.

Third, The combination of the shaft, e, eccentric e', and sliding piece, f, with the crushing block, D, substantially as set forth.

29,198.—E. L. Seymour, of New York City, for an Improvement in Ore Separators:

I claim, first, The arrangement of a series of horizontal and stationary sieves, each acted upon by an air blast from bellows, when arranged in steps as explained, and so that the pulverized ore driven from each preceding one by the air blast shall fall upon and supply the next, all in the manner and for the purpose made known.

Second, With sieves so acting and arranged, the combination of the transverse ribs, i i i, &c., for the purpose set forth.

29,199.—W. M. Sloan, of Buffalo, N. Y., for an Improvement in Stave Machines:

I claim the application and use of the drums, A A, when constructed in the barrel form, in combination with the formers, F F F, so that the stave may be chamfered and crozed while it is bent in the exact form, or nearly so, which it will occupy when set up in the barrel, substantially as described.

29,200.—F. E. Sickles, of New York City, for an Improvement in the Mode of Steering Vessels:

I claim the combination of the rudder of a vessel with machinery to cause the power of steam, in connection with the action of the steersman, to alternately move and hold the rudder.

I also claim the specific arrangement of machinery shown or any other substantially the same, for the purpose specified.

29,201.—C. W. Stafford, of Burlington, Iowa. for an Improvement in Mole Plows:

I claim the adjustable saddle, N, in combination with the mole tooth and its coulter, I, arranged and operating in the manner and for the purpose set forth.

[This invention consists in a novel construction of the mole tooth whereby the soft earth is pressed backward and forced upward against the top of the channel and pressed smooth so as to effectually prevent the surface soil from becoming too much exhausted by the draining off of all the water.]

29,202.—W. A. Sutton, of New York City, for an Improvement in Sewing Machines:

I claim combining a rocking lever, D, which has a curved slot, E F G, near its forward end, with the eccentric pin, H, upon camshaft, P, which latter is arranged near the front end of the machine and near the shuttle and the cloth feeder, with the cams, L K N T', pin, R', hinged shuttle-driving device, Q T, and cloth-feeding mechanism, E W Z, substantially as and for the purposes set forth.

29,203.—I. W. Taber, of New Bedford, Mass., for an Improvement in Lamps:

I claim locating the independent air chamber, e, in the space between the flat wicks of said lamp, and then supplying the said chamber with air through the medium of independent induction tubes, g g, when the united flame produced by both of said wicks is made to pass up through a slit in the deflector, c, which surmounts the perforated sides, b, of the outer air chamber of said lamp—all substantially as set forth.

29,204.—E. U. Thompson, of Bristol, Maine, for an Improvement in Setting-up Ships' Rigging:

I claim, first, The combination of the fid, C, and thimble, B, constructed, applied and operating substantially as and for the purposes set forth.

Second, The lanyard, E E', constructed and operated substantially as described.

Third, The described combination of the jack, H I J K, and lanyard, E' E' operating as set forth.

29,205.—L. Thorp and W. D. Shurtleff, of Turner, Maine, for an Improvement in Railroad Car Couplings:

We claim the hand, P, operating in connection with the guide bar, R, and pin, m, or their equivalents, for the purpose specified.

29,206.—H. D. Vandercook, of Marshall, Mich., for an Improved Clap-boarding Gage:

I claim the mode of holding clapboards in true parallel lines to a building, while they are being scribed, fitted and nailed, by means of the clamping stock, A, and attachments, in combination with the adjustable gage stem, G, constructed and used substantially in the manner as described and set forth.

29,207.—Jonathan Warren and T. C. Silliman, of Chester, Conn., for an Improvement in Fastening Pins in the Bow of Ox Yokes:

We claim the method of fastening pins in the box of ox yokes, by means of the upright loop or staple, B, and the ring, C, or their equivalents, operating substantially as described and for the purpose specified.

29,208.—J. C. Whitson, of Marion, N. C., for an Improvement in Railroad Switches:

I claim, first, The combination of yielding bars, j i, each provided with two links, m p and n o, toothed head-block, S, arm, Z, star wheel, i' j', slotted disk, j'', and wedge-shaped pawl, d', or their equivalents, substantially as and for the purposes set forth.

Second, The combination of the above device, A, with two devices, B C, each of the latter consisting of a sliding bar, v', and two star wheels, x' y', substantially as and for the purposes set forth.

Third, The combination of a slotted sleeper, b, and a wedge-shaped switch bar, c, with wedge-shaped and slotted lifters, o' o', substantially as and for the purposes set forth.

Fourth, The combination of the wedge-shaped switch bar, c, wedge-shaped slotted lifters, o' o', and vanes, p' p', substantially as and for the purposes set forth.

20,209.—Turner Williams, of Providence, R. I., for an Improved Window Stop and Fastening:

I claim combining with a roller and an inclined surface, serving as a stop and support by a nipping action, a spring catch having a locking action, by means of a shank or guiding piece and a spring or constant force, whereby both the said roller and the spring catch may be controlled by a lever attached to the said shank, for the purpose substantially as set forth.

29,210.—O. H. Woodworth, of Coffeeville, Miss., for an Improvement in Watches:

I claim, first, Enclosing the movement of a watch, or other timekeeper, within a case which is permanently air-tight, not only during the ordinary running of the movement, but while it is being wound up or regulated, or having its hands set, as described.

Second, I claim the combination of the setting post, i, the toothed wheel, m, the wheel, p, the pawl, r, the spring, n, and ratchet wheel, q, substantially as described and for the purposes specified.

Third, I claim the arbor, s, with its crank, t, in connection with the forked regulating lever, u, substantially as described and for the purpose specified.

29,211.—G. W. N. Yost, of Yellow Springs, Ohio, for an Improvement in Cotton Cultivators:

I claim the combination and arrangement of the body of the implement and its movable plows, B, scraper, E, and standards, G, constructed as described, whereby it is readily adapted to receive, in turn, the several plows and scraper, in order to perform the various modes of cultivation specified.

29,212.—Abram Acker (assignor to J. S. Wanmaker & Co.), of Ramapo, N. Y., for an Improvement in Spring Hinges:

I claim, first, The combination of fixed cap, D, spring, C, and the cylindrical cap, E, with the tubular eyes, B B', arranged and operating as set forth, in combination with a locking ring, G, or any such equivalent device possessing the advantages set forth.

Second, I claim the projecting lugs on the caps, D E, as and for the purposes set forth.

[This invention consists in constructing the eyes of a butt hinge somewhat larger than they are at present made for ordinary hinges, and with a sleeve joint to keep them in their proper place; and in intro ucing within these tubular eyes, when the two leaves forming the hinge are brought together, an helical spring, which is connnected at the bottom end to a cap that interlocks with the eye of one leaf, and at the top end to a heptagonal or octagonal nut, on which is placed a movable ring of a novel construction that is connected by a V-groove and tenon to the other leaf, or that leaf which is screwed to the swinging door, gate or shutter; the whole are then secured in place by a pintle that passes through the axis of the hinge.]

29,213.—C. R. Alsop, of Middletown, Conn., assignor to J. W. Alsop, of New York City, for an Improvement in Revolving Fire-arms:

I claim the employment, for the purpose of forcing forward the cylinder longitudinally towards the barrel before firing and of permitting the movements longitudinally away from the barrel, of a cam formed with a regular series of projections and recesses on its periphery, applied substantially as described, and rotating in one direction only.

And I also claim combining such cam with the hammer, either directly or indirectly, by a ratchet and pawl, or their equivalent, in such manner as to be operated by the cocking of the hammer, substantially as described, but to remain stationary during the fall of the hammer.

29,214.—Lester Butler (assignor to himself and C. B. Ford), of Kenosha, Wis., for an Improvement in Railroad Gates:

I claim the application of the spiral groove attached to either the posts of the gate or to the cross-piece, G, in combination with the construction of the rails, as set forth, as and for the purpose described.

29,215.—Samuel Favinger (assignor to himself and Absalom Barned), of Philadelphia, Pa., for an Improvement in Smut Machines:

I claim, first, The fan chamber, G, with its vanes, H, when arranged in respect to the hopper, p, the passage, m and q, and the casing, L, containing the burr, K, substantially as and for the purpose set forth.

Second, I claim the peculiar construction of the tapering block or burr, K, with its V-shaped projections, having V-shaped ribs, as and for the purpose specified.

Third, The arrangement of the plate, D, with its ribbed surface, the bar, d, with its ribbed branches, and tapering burr and casing, L, for the purpose set forth.

29,216.—Benjamin Garvey, of New York City, assignor to himself and J. B. Davol, of Brooklyn, N. Y., for an Improved Arrangement for Lubricating Pistons:

I claim the combination and arrangement of a lubricator with a piston and cylinder, a valve, or other bearing, for forcing water between rubbing surfaces, substantially as described.

29,217.—Benjamin Garvey, of New York City, assignor to himself and J. B. Davol, of Brooklyn, N. Y., for an Improved Steam Generator:

I claim the form of steam generator substantially described, when employed as specified.

29,218.—Benjamin Garvey, of New York City, assignor to himself and J. B. Davol, of Brooklyn, N. Y., for an Improvement in the Distillation of Coal Oil:

I claim the economizing of caloric, in the manner substantially as described, whatever form of apparatus may be employed for carrying out said invention, and to whatever purpose the same may be applied.

29,219.—Otis Hood, Jr., of Turner, Maine, assignor to himself and H. G. Le Baron, of Portland, Maine, for an Improved Coupling for Railroad Cars:

I claim my improved railroad carriage coupling, having its separate parts constructed and arranged in relation to each other and so as to operate together, substantially as shown and described.

29,220.—J. T. Van Kirk (assignor to C. A. Van Kirk & Co.), of Philadelphia, Pa., for an Improved Ice-pick:

I claim the pointed stem, A, with its weighted handle, B, in combination with the tube, D, or other equivalent guide, serrated or otherwise so constructed at its lower end as to retain a hold on the ice during the descent of the said weighted stem, as set forth for the purpose specified.

29,221.—J. T. Van Kirk (assignor to C. A. Van Kirk & Co.), of Philadelphia, Pa., for an Improvement in Lamps:

I claim combining the tube, G, its rods, H, and coiled spring, e, with the flange or projection which inclose the lower end of the chimney or shade of a lamp, in the manner and for the purpose set forth.

29,222.—J. J. McCormick and J. E. Jerrold (assignors to J. E. Jerrold and Eugene Beggs), of Paterson, N. J., for an Improvement in Car Springs:

I claim, first, The employment, for the purpose of producing a car spring, of a long thin strip of sheet steel, wound up so as to form a close coil, A, and fastened in this position by clamps, B, or their equivalents, substantially in the manner set forth.

Second, The arrangement, in combination with the coil, A, of a case, C, constructed and operating substantially as and for the purpose specified.

[This invention consists in the employment, for the purpose of producing a car spring, of a long thin strip of sheet steel, wound up so as to form a close coil, and retained in this form by two clamps. Pivots projecting from these clamps form the guides for the spring in the case, which consists of two parts, one sliding over the other, and which is so proportioned in relation to the coil that it checks the motion of the spring beyond a certain limit.]

29,223.—F. W. Mallett (assignor to G. F. Kimball), of New Haven, Conn., for an Improved Felly Machine:

I claim, first, The combination of the hook, e, with the cutters, n n, &c., with the guide or rest, F, when constructed, arranged and made to produce the result, substantially as described.

Second, I claim the combination of the cutters, n n, &c., with the guide or rest, F, when the whole is constructed, arranged and made to produce the result substantially as described.

29,224.—Louis Planer and J. N. Siegl (assignors to Louis Planer), of New York City, for an Improvement in Shuttles for Sewing Machines:

We claim the combination, with the shuttle, A, bobbin, D, movable center, B, and spiral spring, b, or its equivalent, of a transversely arranged adjusting screw, c, formed or provided with an eccentric, e, for operating within a recess made in the movable center, or for action against the latter in a direction contrary to that of the spring and away therefrom, the same forming an adjustable stop or locking pin to the movable center, substantially as and for the purposes set forth.

29,225.—J. C. Plumer (assignor to himself and David Robinson, Jr.), of Portland Maine, for an Improved Shoemaker's Last:

I claim, first, The longitudinal hollow or depression on the bottom of the last.

Second, The combination of the longitudinal hollow with the advanced position of the heel seat.

Third, The constricted portion of the last, c e, in combination with the longitudinal hollow.

29,226.—R. W. Sievier, of Upper Holloway, England, assignor to Wm. Lilley, of the State of Ohio, for an Improved Apparatus for Exhausting Atmospheric Air or Gases:

I claim the application to ships, mines, buildings, &c., of a jet of steam or air in a shaft or flue in connection with the fan and director, when the said devices are constructed and arranged as specified, in the manner and for the purpose set forth.

29,227.—Albert Wild (assignor to Dinkerspiel & Oppenheimer), of New York City, for an Improvement in Watchmaker's Lathes:

I claim, first, The arrangement, in combination with the shear, B, of a watchmaker's lathe, of the sliding head, G, with the vertically adjustable part, d, and with the swinging frame, H, constructed and operating in the manner and for the purpose set forth.

Second, The combination with the spiral toothed adjustable cutter, K, of the pivoted two-armed lever, M, with the set screw, o, constructed and operating substantially as and for the purpose described.

[This invention consists in arranging, on the shear of a watchmaker's lathe, a sliding head with a swinging frame, which receives the rotary cutter in such a manner that, by swinging said frame backward and forward, the cutter is forced towards and from the center of the lathe spindle or of the wheel, and thereby the cutting is produced; also, in the arrangement of a pivoted two-armed lever provided with adjustable centers to receive and hold the wheels after the same have undergone the first operation of cutting, and furnished with a set screw to determine and regulate the depth to which the teeth of the wheel are to be worked, in combination with a spiral-toothed self-feeding cutter, for the purpose of rounding off the teeth and to regulate their depth and the diameters of the wheels.]

RE-ISSUES.

Ephraim Ball, of Canton, Ohio, for an Improvement in Mowing Machines. Patented Dec. 1, 1857; re-isssued Sept. 27, 1859:

I claim, first, Hinging the right end of the coupling arm, R, to the lugs, R' R', in combination with curving up the coupling arm as it extends toward the machine, substantially as shown and set forth.

Second, I claim the combination of the shoe or brace-bar which supports the heel of the finger-beam with the hinge by which it is drawn, arranged above the plane of the cutter and in advance of the heel of the finger-beam, substantially as set forth.

Third, I claim connecting the coupling arm to the shoe by a hinge, whose axis of motion is on a line with that of the draft hinge of the finger-beam, in combination with so arranging said hinges as respects the main frame as that the strain due to the draft or drawing of the finger-beam forward will be borne by one end of the main frame and on one side of the axis of the driving and bearing wheels, while the lateral strain through the coupling arm will be borne by the other end of the main frame and on the other side of the axis of the driving and bearing wheels.

Ephraim Ball, of Canton, Ohio, for an Improvement in Mowing Machines. Patented Dec. 1, 1857; re-issued Sept. 27, 1859:

I claim, first, Extending and hinging the coupling arm, R, to the shoe which supports the heel of the finger-beam outside of the frame, in combination with the draft hinge of the shoe also outside of the main frame, whereby the finger-beam and cutting apparatus can be first raised up bodily until the coupling arm strikes against the under side of the frame and then the outer end thereof turned up towards the frame, substantially as set forth.

Second, I claim mounting the two driving gear wheels and main gear wheel on separate axles, in combination with a ratchet wheel and small gear wheel for each driving gear wheel, each ratchet wheel being fitted with a pawl that can be made to stand in gear by the forward motion of the machine and out of gear by the backward motion of the machine, the whole arranged and operating substantially as set forth.

Third, I claim the combination of a ratchet wheel, a pawl, a spring acting on the pawl and a case with one or both ends of the shaft of the main gear wheel, whereby the case is made to perform four duties, namely, a support to the pawl, a support to the spring, a cover to protect the pawl, spring and ratchet, and the connection by which motion is communicated to the shaft of the main gear wheel, substantially as set forth.

Fourth, I claim the combination of a shield, E'', with each of the cases, G', and ratchet wheels, H, substantially as set forth.

Fifth, I claim the combination of the balance wheel, L, with shaft, K, and gear wheels, I J, whereby the balance wheel is made to perform not only the function of a balance wheel to regulate the motion of the crank shaft, but also that of a guide or guard and shield to keep the gear wheels, I J, in their proper and relative positions, substantially as set forth.

Sixth, I claim the combination of a balance wheel with each end of the crank shaft and its hangers or bearings, substantially as set forth.

Seventh, I claim making the pitman in two parts, N N', in combination with uniting said parts, substantially as set forth.

Eighth, I claim the combination of the hinged cutting apparatus with a pitman or connecting rod swiveled at both ends, substantially as set forth.

Ephraim Ball, of Canton, Ohio, for an Improvement in Mowing Machines. Patented Dec. 1, 1857; re-issued Sept. 29, 1859:

I claim, first, The combination of the hangers which support the crank shaft and coupling arm with the central pieces, A' A', whereby the hangers are made to perform the additional function of braces to the main frame, substantially as set forth.

Second, I claim so constructing and combining a hinged finger-beam with a main frame as that no part of the finger-beam will project by the rear of the main frame, nor any part of the main frame by the rear of the finger-beam, whereby an attendant can freely approach the finger-beam from the rear and raise up the outer end thereof to avoid an obstruction while the heel of the finger-beam is free to rest on the ground and to conform to the inequalities thereof, independently of the up-and-down motion of the main frame, substantially as set forth.

Third, I claim the combination of the coupling arm and finger-beam with the slotted metallic part, S, whereby the finger-beam and cutting apparatus, when turned up towards the main frame to avoid and pass obstructions, will be prevented from falling over against the main frame, substantially as set forth.

Fourth, I claim the combination of the finger-beam with the coupling arm and a stop, whereby a portion of the weight of the finger-beam, as it is raised up bodily, after the outer end has been turned up to pass an obstruction, will rest on the left hinge of the coupling arm, substantially as set forth.

Ephraim Ball, of Canton, Ohio, for an Improvement in Mowing Machines. Patented Dec. 1, 1857; re-issued Sept. 27, 1859:

I claim, first, The combination with the main frame of a mowing machine of two independent driving wheels and a hinged cutting apparatus, whereby the cutters are kept in operation when the machine is turned either to the right or left, while the cutting apparatus (or either end thereof) is free to conform to the inequalities of the ground, independently of the up-and-down motions of the main frame, substantially as set forth.

Second, I claim hinging one end of the coupling arm, R, to lugs on the shoe which supports the heel of the finger-beam and cutter bar, in combination with hinging the other end on a line with the longitudinal center of the crank shaft which operates the pitman and cutters, substantially as set forth.

Third, I claim the combination of the heel of the finger-beam, P, and one end of the coupling arm, R, with a strong metallic draft shoe, substantially as set forth.

Fourth, I claim so hinging the shoe which supports the heel of the finger-beam to the main frame, as that it will permit the heel of the finger-beam, to which it is rigidly attached, to move freely in the arc of a circle, as it rises and falls, so as not to cramp or bind the joints of the coupling arm, R, or its equivalent, substantially as set forth.

Ephraim Ball, of Canton, Ohio, for an Improvement in Mowing Machines. Patented Dec. 1, 1857; re-issued Sept. 27, 1859:

I claim the combination in a mowing machines of the following elements, viz.: a rigid tongue to draw and steady the machine by, a frame to support and carry the driver and gearing, two independent driving and bearing or supporting wheels to carry the frame and give motion to the cutters, and a short finger-beam so hinged to the main frame that its progressive movement over the ground will be controlled by the main frame and the upward and downward movements of the entire finger-beam, or of either end thereof, independently of the other, by the undulations of the ground over which it is drawn.

Ephraim Ball, of Canton, Ohio, for an Improvement in Mowing Machines. Patented Dec. 1, 1857; re-issued Sept. 27, 1859:

I claim, first, The combination of the finger-beam and the main frame with a single yielding brace-bar or shoe, whereby the progressive movement of the finger-beam over the ground will be controlled by the frame frame and the free upward and downward movements of the entire finger-beam, or of either end independently of the other, and of the up-and-down movements of the main frame by the undulations of the ground over which it is drawn, substantially as set forth.

Second, I claim the combination of a yielding brace-bar or shoe, Q, and a yielding coupling arm, R, with the main frame, substantially as set forth.

Third, I claim the combination of the short finger-beam with the yielding connection with the main frame, substantially as set forth.

Ephraim Ball, of Canton, Ohio, for an Improvement in Mowing Machines. Patented Dec. 1, 1857; re-issued Sept. 27, 1859:

I claim, first, The combination of a hinged folding finger-beam, with the main frame, whereby the finger-beam can be raised, turned or folded upon or over the main frame, without detaching the draft hinge, to facilitate the removal of the machine from place to place or from field to field, substantially as set forth.

Second, I claim so hinging the finger beam to the main frame, as that the weight of the finger-beam when folded up thereon, shall rest on or be borne by the main frame, in front of the axes of the main supporting wheel or wheels, substantially as set forth.

Third, I claim the combination of the finger-beam with the main frame, and mechanism so constructed and combined therewith, as that the finger-beam can be raised bodily, and then turned and held up, to render the removal of the machine from place to place more convenient, expeditious and safe, substantially as set forth.

Fourth, I claim the combination of the finger-beam with the main frame, whereby the finger-beam can be raised, turned or folded over on or above the main frame, so that its weight shall be borne by the main frame, in rear of the axes of the supporting wheels, substantially as described.

Fifth, I claim the combination of the finger-beam with the main frame, whereby the finger-beam can be raised and turned over above the main frame with its weight resting either in front or in rear of the axes of the main supporting wheels, substantially as and for the purposes set forth.

Sixth, I claim so hinging the finger-beam to the main frame, as that the main frame shall be nearly balanced laterally, when the finger beam is folded up thereon, substantially as set forth.

Seventh, I claim so hinging the finger-beam to the main frame, as that it can be folded under the main frame, substantially as and for the purposes set forth.

Eighth, I claim the combination of the finger-beam with the main frame, so that the finger-beam can be either folded over or under the main frame, substantially as set forth.

Ninth, I claim the combination of the following elements in a shoe or metallic device for supporting the heel of the finger-beam, viz.: A curved surface to run upon the ground like a runner, a recess or arrangement of parts, whereby the heel of the finger beam will have a rigid metallic support in front on the bottom, and in rear: a suitable groove for the heel of the cutter bar and inner cutter to play in, two metallic lugs on the side next to the main frame between which to hinge a coupling arm, all combined in one rigid and permanent shoe device.

Tenth, I claim the combination of the following elements in a metallic shoe for supporting the outer end of the finger-beam, viz.: A curved surface to run upon the ground like a runner, a recess for the outer end of the finger-beam, whereby it can be bolted to the shoe so as to have a rigid support in front, on the bottom, and in the rear; a groove for the outer end of the cutter bar and outer cutter to work through; and two lugs in the rear, said elements being combined and arranged in relation to each other, substantially as shown and described.

Philander Shaw, of Boston, Mass., for an Improvement in Air Engines. Patented May 2, 1854:

I claim the described auxiliary heater, constructed and arranged as set forth; the exhaust air, and the products of combustion being passed through in one direction, while the cold air from the force pump is passed hrough in the other, by which means the heat is extracted from the heated air and smoke, and transferred to the cold air on its way to the engine, the latter being pumped in against a pressure much less than that at which it is worked off from the main heater, as explained.

Second, I claim the arrangement described of the tubes within the piston rod, the reservoir, R, and the india-rubber tubes, S S', for the purpose set torth.

Third, I claim passing the exhaust air which has propelled the piston directly through the fire, for the purpose of economizing heat, as set forth.

ADDITIONAL IMPROVEMENTS.

Joseph Tiberi, of St. Louis, Mo., for an Improvement in Grates. Patented Sept. 6, 1859.

I claim the combination of the adjustable back, E, with the stationary back, B, when they are arranged with reference to each other and with the flue, T, behind them and under the grate, in the manner shown and described.

Frederick Yeiser, of Indianapolis, Ind., for an Improved Instrument for Taking Altitudes of the Sun. Patented Feb. 8, 1859:

I claim the arrangement of the cylinder F, with the spirally curved lines drawn upon it, and the bar, P, with the hour lines drawn upon it, in such relation to each other, and to the limb, H, and the declination arc, J, and limb, K, and plates, f f ff, and the solar lenses in said plates, that it operates substantially as and for the purposes specified.

DESIGNS.

Elnathan Peck, of New Britain, Conn., for a Design for a Gridiron.

G. Smith and H. Brown (assignor to Samuel Smith), of Philadelphia, Pa., for a Design for the Plates of a Cook's Stove:

Notes and Queries

CORRESPONDENTS sending communications for publication in our columns are requested to avoid writing on both sides of a sheet of paper. This fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer (especially in long articles), and, when combined with illegibility of handwriting, often causes interesting contributions to be regretfully consigned to our waste-paper basket.

INQUIRER, of Jersey City, N. J.—We have received an important letter for you, in reference to your own communication on the subject of "Ventilation of Mines," published on page 18 of this present volume. Please send us your full name, &c.

G. L. T., of Woodlawn, Md.—We direct your attention to claim No. 29,226, in the list of claims published in the present number.

C. C. P., of Ohio.—There is no solution for copper tubes which can withstand the action of hot brine and steam for a very long time. Copper tubing is now drawn without any seams, thus dispensing with solder. It may be that there is something peculiar about the brine at your place.

L. F., of N. Y.—You will find a very complete account of the art of enameling in Tomlinson's "Cyclopœdia." The art, for ornamental purposes, is not much practiced in the United States.

A. W. T., of N. J.—The expansion of water at 70°, as given by Kopp (perhaps the highest authority), is 1.00753. The discrepancy you call attention to is of no practical account.

L. S. E., of N. Y.—You will find a spirit varnish of bleached shellac or of copal suitable for shell-work. You can procure it of good quality without difficulty.

J. J., of Maine.—In preparing quick-drying linseed oil, add about an ounce of the sulphate of zinc, and an equal quantity of litharge, to the oil while it is boiling. You must add the oxyds of zinc and lead in very small quantities or the oil will foam over. About six hours' boiling will be sufficient for your purpose.

W. G. B., of La.—We intend soon to publish a series of articles on electrical machines, from which you will obtain information about making conductors. Tomato wine is made by fermenting the juice of this plant with about two pounds of sugar to the gallon. Care must be exercised so as not to permit the fermentation to reach the acetous stage. You will be able to judge from the taste when it is fit for bottling. Some persons add two quarts of water to every gallon of juice.

W. B., of Pa.—It is quite true, as you have stated, that the common lifting pump frequently clogs, when used for pumping up tanning liquors in which there is a sediment; but we do not think that an elevator, such as that used for lifting grain, could be used as a substitute. The buckets of the elevator would be liable to leak; still we advise you to make an experiment to satisfy yourself.

G. F. L., of N. H.—In generating hydrogen gas from water by the use of zinc and sulphuric acid, you should expel all the air from the receiver before you close it to retain the hydrogen, because the latter mixes with the oxygen of the air and forms an explosive mixture. Hydrogen gas can be generated under considerable pressure.

N. H., of Ga.—Tin is not a manufacture excepting so far as it relates to the smelting of the ores to obtain the metal. Tin ore is obtained in various parts of the world, and the process of smelting is well known to all metallurgists. The best tin comes from the Island of Banca, in the Indian Archipelago; but the greatest quantity is obtained from the mines of Cornwall, in England.

W. D., of Mass.—No advantage could be gained by making balloons double, to permit the escape of expanded gas from the inner to the outer one in the higher regions. To permit the free expansion of the gas, when the atmospheric pressure decreases in ascending, balloons are never filled to extreme bursting pressure, but are somewhat slack when they arise from the ground. The balloon is also left open at the bottom, so that it is scarcely possible that it can explode.

L. P. L., of N. Y.—The best substance for cementing glass ware is a strong solution of silicate of soda. Currant bushes can be kept free from aphides by the application of water in which some tobacco has been steeped. A pound of tobacco will make 20 gallons of juice, which we have also found useful for sprinkling on rose bushes and grape vines infected with bugs.

T. M. H., of Vt.—To dye feathers red, clean them well by washing in soap suds, then boil them in a liquor with hypernic and a very little alum for about half an hour. Now take them out, wash and dry. You must use a clean tin dish for boiling them in, as an iron vessel would stain them black. A red color dyed in this manner is not so bright as if dyed with cochineal and the chloride of tin, but it is the most simple method for your purpose.

W. A. J. B., of Ga.—An explosion cannot take place from carbonized oil in a boiler by the gas mingling with the oxygen of the water, as you have stated, because there is no free oxygen in the boiler. Certain kinds of water produce priming in boilers, but the water is not explosive on that account. If you had furnished us (as no doubt you can do) with any facts on the subject, it would have been of interest to publish them.

E. F., of N. Y.—Galvanized metal is sheet iron coated with zinc. Pipes made of galvanized iron are not suitable to be buried in the ground to convey water. They cannot be employed as substitutes for lead pipe, and we could not recommend their use for domestic purposes.

E. N. C., of N. Y.—The resistance to the flow of water in pipes increases with the length, and is caused by friction. There are differences of opinion as to the appropriate length of feed-pipe, under a given head, for a water ram; but we do not see why a 7-foot feed-pipe, under a 7-foot head, is not better than a 30-foot pipe (as was recommended to you) under such a head.

G. B., of N. Y.—You are correct in the practice of farming by having a rotation of crops; but you are entirely mistaken in stating that, without adding fertilizers and by simple crop rotation, "the soil of England is capable of yielding fifty per cent more than it did fifty years ago." The farmers of England manure largely; and in the vicinity of New York two crops, every season, are taken off many of the fields by high fertilization. If, according to your theory, the constituents of the plants are not derived from the soil, why do you have a rotation of crops? why not plant the same crops year after year?

A. S., of N. Y.—After applying for a patent, you can give the privilege to any number of persons to construct any number of the machines or contrivances for which you are seeking a patent without prejudice to your rights after the patent shall have been granted. The selling of a machine of the kind you are endeavoring to patent will not affect the patent, nor your rights under it, unless such sale shall have taken place more than two years prior to the date of your application. There may be other circumstances amounting to an abandonment of your invention to the public, and which would prevent your right to a patent within less than two years, but the simple sale of one of the machines would not produce this effect within less time than is above stated.

S. F. L., of N. H.—We do not know that there is any limit to the pressure under which water will be decomposed by the battery, or by sulphuric acid and iron. No experiments have been made to settle such a point. A solution of copperas will not absorb hydrogen. You ask how large a battery of zinc and copper will be required to raise ten quarts of water to the boiling point. The question is indefinite. It is like asking how large a gas flame will be required for such a purpose. Any battery or gas flame will do it, provided you give it time and lose none of the heat.

C. T. M., of S. C.—Your subscription will expire with No. 10, Vol. V. We do not think you will find it practicable to use sulphuric acid in the way you indicate, in the manufacture of turpentine and resin.

C. B. E., of N. Y.—As the water in the boiler of a steam engine is evaporated into steam, the supply can be kept up only by forcing water into the boiler against the pressure of the steam, and this is done by means of the feed-pump. If either the receiving or delivery valve should become so deranged as not to permit the passage of the water, the pump of course would not work.

J. W. S., of Mass.—The leverage of a screw-driver varies with the length of the handle, if a cross handle; but the idea that it is affected by the length of the blade is absurd.

D. S., of Ill.—To mix oil with water, dissolve about one ounce of potash in a pint of water; then pour in a wine-glass full of sweet oil, and stir them thoroughly, when the mixture will become white and opaque, like sweet milk. These proportions will answer for any other quantity.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, July 21, 1860:—

W. K., of Ill., $25; C. M., of Wis., $35; W. H. B., of Conn., $25; M. M. C., of N. Y., $30; W. M. K., of N. Y., $30; M. & L., of Mass., $30; C. C. G., of Ala., $41; E. F. M. F., of Vt., $55; J. G., of Mass., $60; S. C., of Ga., $30; C. & B., of Mass., $25; J. B. McE., of Pa., $40; A. S. B., of Iowa, $28; F. C. K., of N. J., $30; J. H. L., of N. Y., $30; W. & W., of Ill., $25; J. C. A., of Texas, $25; J. M. T., of Pa., $55; A. & B., of N. Y., $250; W. M., of Minn., $25; S. & C., of Cal., $40; A. G. C., of N. Y., $55; T. W., of N. Y., $12; J. C. T., of N. H., $30; T. & G., of Miss., $25; B. S. P., of Ga., $30; B. F. G., of Mass., $30; A. W. J., of Conn., $30; S. D. McC., of Ky., $25; W. C., of Ohio, $25; J. G. C., of Miss., $20; H. L. McN., of Mass., $30; T. S., of Cal., $10; J. & C., of La., $30; W. H. D., of Ill., $25; C. P. B., of Ohio, $25; J. B. M., of Ill., $30; J. F. B., of N. Y., $58; H. W. N., of Ala., $60; J. H. H., of Ga., $25; S. P., of N. Y., $30; E. B., of N. Y., $30; H. J. C., of Mass., $250; J. B. S., of Mich., $25; J. D., of N. Y., $30; S. L., of Vt., $25; J. J., of Maine, $30; C. L., of Cal., $45; J. W. C., of N. Y., $165; L. S. G., of N. Y., $30; A. & G., of N. Y., $30; M. & B., of R. I., $28; M. G. W., of Ill., $30; H. R., of N. Y., $25; A. R., of Ga., $110; T. B., of Va., $25; G. H. & S. F., of N. Y., $15; J. D., of Ind., $35; W. D. M., of Va., $30; D. & C., of N. Y., $25; J. S. S., of N. Y., $25; F. A. H., of Ill., $55; G. L. T., of N. Y., $25; A. S., of N. Y., $55; T. G. E., of Ill., $30; J. H. B., of Ill., $25; J. G. R., of Cal., $25, L. A. B., of N. Y., $30; H. W. U., of Ala., $30; A. A., of Conn., $25; J. G., of N. Y., $25; J. C. A., of N. Y., $55; G. P. R., of Mass., $30; I. C. T., of Pa., $25; A. A. R., of Mass., $30; D. F., of Ohio, $25; H. N., of N. Y., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 21, 1860:—

C. P. B., of Ohio; W. H. B., of Conn.; J. H. H., of Ga., B. A. G., of Mass.; G. W. R., of N. Y.; J. R., of N. J.; C. & B., of Mass.; A. S. B., of Iowa; J. C. A., of N. Y.; J. C. T., of Tenn.; D. F., of Ohio; L. S. G., of N. Y.; J. I., of Vt.; J. S. I., of N. Y.; W. M., of Miss.; C. M., of Wis.; T. W., of Ga.; J. B. S., of Mich.; G. L. T., of N. Y.; J. B. McE, of Pa., J. J., of Maine; W. C., of Ohio; J. G. W., of N. Y.; J. H. B., of Ill.; J. E. L., of N. Y.; J. C. A., of Texas; J. G. R., of Cal.; J. G., of N. Y.; W. K., of Ill.; T. & G., of Miss.; S. G., of Ill.; M. G. W., of Ill.; H. R., of N. Y.; S. L., of Vt.; S. D. McC., of Ky.; A. S., of N. Y.; H. W. N., of Ala.; D. & C., of N. Y.; A. A., of Conn.; W. & W., of Ill.; J. F. B., of N. Y.

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IRON PLANERS, ENGINE LATHES, AND OTHER Machinists' Tools, of superior quality, on hand and finishing, and for sale low; also Harrison's Grain Mills. For descriptive circular, address New Haven Manufacturing Co., New Haven, Conn. 1 13

BOILER FLUES FROM 1¼ INCH TO 7 INCHES outside diameter, cut to any length desired, promptly furnished by JAMES O. MORSE & CO.,
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SOLID EMERY VULCANITE.—WE ARE NOW manufacturing wheels of this remarkable substance for cutting, grinding and polishing metals, that will outwear hundreds of the kind commonly used, and will do a much greater amount of work in the same time, and more efficiently. All interested can see them in operation at our warehouse, or circulars describing them will be furnished by mail.
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AIKEN KNITTING MACHINE COMPANY, NO. 429 Broadway, New York, sole proprietors of J. B. Aiken's family and plantation knitting machines. Extremely simple, profitable and durable. Satisfaction guaranteed to all. Send in your address, every one, and full particulars will be sent to you, with illustration of machine, gratis. 22 13

C. L. GODDARD, AGENT, NO. 3 BOWLING Green, New York. Only Manufacturer of the Steel Ring and Solid Packing Burring Machines and Feed Rolls for Wool Cards, &c.
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BURNELL'S PATENT ROTARY PUMP—adapted to all purposes of pumping, from the well and cistern to the steam fire-engine. The most simple, durable and efficient pump yet made. Principal sales depot at No. 23 Platt-street, New York. [1 13*] SAMUEL B. LEACH.

PORTER'S CENTRIFUGAL GOVERNOR.—THE attention of parties troubled with irregular or unsteady power is respectfully called to this Governor, now coming into general use. It may be used in connection with any valve or cut-off, and will regulate the motion of the engine so perfectly that its entire load may be thrown on or off at once, without sensibly affecting its speed. I will send a Governor to any responsible person for trial; and if its action is not perfect under the above test, it may be returned. Prices exceedingly moderate. All orders and communications will receive prompt attention. Send for a circular.
Address CHAS. T. PORTER, 235 West Thirteenth-street, corner of Ninth-avenue, New York. A few reliable agents wanted.
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MACHINISTS, &C. — INVENTORS' MODELS made by STOCKMAR & BAADE, No. 39 Greene-street, near Grand, New York City. 1 12*

DUDGEON'S PORTABLE HYDRAULIC JACKS for raising heavy weights, boilers, locomotives, cars, stone, stowing cotton, pulling, &c. Frames and platens for stationary pressing, of different sizes, made to order. Dudgeon's portable hydraulic punches for punching or shearing iron, die-sinking and other purposes, where, with a limited movement, great power is required. Send for a circular. DUDGEON & LYON, No. 466 Grand-street, New York. 8 13*eow

GRAY & WOODS' PATENT IMPROVED Planer; a combination of the Woodworth and Daniels' planers, particularly adapted for shop work, and for which we have obtained three patents and six medals. (See description and illustration in No. 6, Volume II., SCIENTIFIC AMERICAN.) Also, for sale, all kinds of wood-working machinery. Send for a circular. Address GRAY & WOODS, No. 69 Sudbury-street, Boston, Mass. 1 tf

FAN-BLOWERS — OF VARIOUS SIZES AND kinds, for smiths' fires and foundries, for sale by SAMUEL B. LEACH, No. 23 Platt-street, New York. 1 11*

A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence.
MUNN & CO., Scientific American Office, No. 37 Park-row, New York.

IMPROVEMENTS IN FIRE-WORKS WANTED.

Our national anniversary was celebrated this year in the time-honored way, by grandiloquent speeches, feasting and gunpowder; and there were the usual incidents of accident and crime, furnishing the newspapers, for a week after, with frequent items of conflagrations, explosions, maimings and deaths. So another year has verified the prediction of John Adams.

It is the juvenile portion of the community who chiefly make the Fourth of July noisy and brilliant with bonfires and illuminations; older people are quite tired of ear-piercing sounds and sulphurous smoke. As we reach that age when "the grass-hopper becomes a burthen," how intolerable must be the din of guns and fire-crackers! It is cruel, perhaps, to deny the boys their sport, but it is proper to see that it shall not be attended with so much danger and nuisance.

Old Friar Bacon might well have hesitated to give his invention of gunpowder to the world, had he foreseen the destruction of life and property it was fated to bring. What a mis-use of powder is the propelling of a bullet into the human head or heart! There is not a pound of powder in a million that is burned in a way that advances the cause of humanity. The *pyrotechnic art*, however, has always been popular, and, perhaps, is worthy of encouragement among enlightened people. But, if so, why should it not be progressive, like all other arts—why should not the most enterprising people practice it with greatest success? This art, in Europe and America, is almost where it was 50 years ago; we still depend upon China for the universal fire-cracker. Yet those concerned are beginning to find out that something new is required, and the inventor must take possession of the field. Mr. Hadfield, of this city, lately applied electricity as a means of firing, simultaneously, all the parts of a large exhibition; and he has contrived a rocket which explodes its stick in the air. Mr. Edge has invented a curious torch to be used in processions. These are only humble beginnings of what we have a right to expect from the science and genius of the age. Some use must be made of the electric light, the lime light, and even of common gas. It is, we believe, practicable—by a proper use of materials and easily contrived mechanical movements—to produce most of the desirable mechanical effects of gunpowder, without its danger and nuisance of stench and smoke.

THE INVENTOR AND HIS TRAPS.

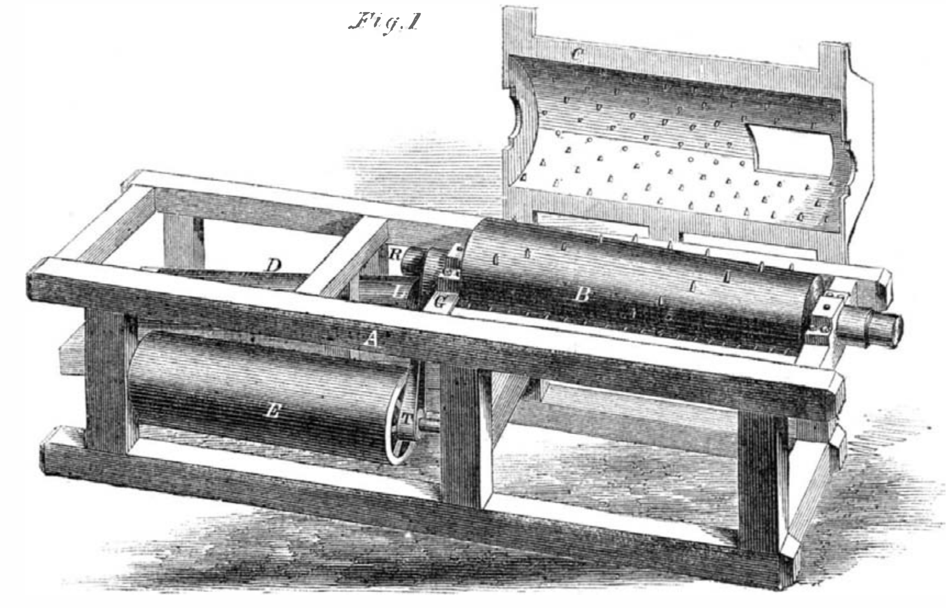
We referred, in our last number, to Senator Davis's law prohibiting the War and Navy Departments to purchase any patented article. This, it appears, embarrasses both departments just now, as revolvers and other arms are much needed for the Indian country and for shipboard; but none can be purchased, and the government cannot make them. Congress appropriated, in the naval bill, $338,000 for the purchase of ordnance and small arms, and then sneaked a law through, by means which no member of Congress yet heard from can explain, preventing Secretary Toucey from making the purchase. The daily papers have given this subject unusual prominence, and have spoken strongly against this species of prohibitory legislation. It appears, after all, that one of the most important personages in connection with the government is the inventor; the utility of his "patent traps" are thus made singularly manifest.

NUMBER OF LOCOMOTIVES USED BY 12 RAILROAD COMPANIES.—The following table, compiled from the latest returns, shows the number of engines in use by 12 of the prominent railroads of this country:—Baltimore and Ohio, 235; New York and Erie, 219; Pennsylvania, 213; New York Central, 211; Grand Trunk, 203; Philadelphia and Reading (coal road), 149; Illinois Central, 113; Michigan Central, 98; Pittsburgh, Fort Wayne and Chicago, 96; Michigan Southern, 91; Great Western (Canada), 87; Western (Massachusetts), 72. Total, 1,787.

IMPROVED RICE AND CLOVER HULLER.

The price of seeds and grain in the market is governed, in a superlative manner, by the action of the machines employed for cleaning them. If the machine breaks the grain or seed, and is not effectual in removing all the dirt and hulls, of course, the prices which the products bring will be much lower than if they were perfectly cleaned and uninjured. A simple and effective hulling machine, therefore, is of great consequence.

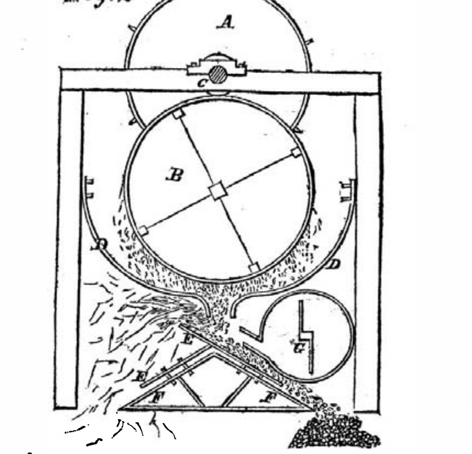
Fig. 1



BURROWS' RICE AND CLOVER HULLER.

The accompanying engravings represent an improved huller for rice and clover, for which a patent was granted on the 8th of May last; Fig. 1 being an open perspective, and Fig. 2 a vertical section of the machine. We will describe the two figures separately. A (Fig. 1) is the frame, B is the threshing cylinder with projections upon its outer surface, and C is the concave, with projections on its interior surface for covering the threshing cylinder. D is the rotating bolt, and E is the fan. The rubbing cylinder, B, is conical, and the concave cover is made to correspond with it. The teeth are set spirally around the cylinder, but the spiral decreases as it approaches the discharging end in proportion as the cylinder enlarges. The effect of this arrangement of teeth is to retard the rate at which the chaff and grain approach the end of the cylinder at which it is discharged, while its rotary motion (owing to the increased circumference of the cone) is greatly accelerated. At the same time, a very equal motion is preserved

Fig. 2



throughout, and the grain is thus very thoroughly and speedily separated from the chaff, &c.

Fig. 2 shows the interior of the machine, and the operation whereby the chaff is carried forward and the grain separated from the hulls, &c. A is the threshing and B the bolting cylinder; C is a bearing of the cylinder; D D are zinc plates to catch and direct the grain and chaff after leaving the bolting cylinder; E E are adjustable plates to direct the discharge of the seed to either side of the machine; F F are supports for the adjustable plates. The fan, G, is so arranged as to be reversible to the other side of the machine if this is required.

The grain and chaff are fed in by the opening in the top of the concave, C, and are carried forward by the increasing pitch of the cone, and discharged by a trough into the rotary bolt, D, which is hung on a swing frame. The bolt cylinder, which consists of a wire cloth stretched over a frame and is open at both ends, receives its rotary motion from the shaft of the threshing cylinder by means of a friction pulley, L, on its upper end, which is held in contact with a friction roller, R, upon the shaft of the cylinder, B, by a spiral spring (not shown), which keeps the friction surfaces in contact. A cross belt, T, passes from a pulley on the cylinder shaft over on the fan shaft to give the latter motion. The pins and teeth in the concave and cylinder gradually diminish in length. The grain is effectually rubbed between the rough concave and convex surfaces of the cylinder, B, and its cover, C; then it is effectually bolted in D, and winnowed at the same time by the fan. The machine is compact, considering the comprehensive acting surfaces which it contains, and its movements are secured in a very simple manner, as the main cylinder is driven by a belt from any power, and this gives motion to all the other parts.

Further information may be obtained regarding this invention by letter addressed to the patentees, Stephen Burrows & Co., who reside at Whitewater, Wis.

GINGER LEMONADE.—Boil twelve pounds and a half of lump sugar for twenty minutes in ten gallons of water; clear it with the whites of six eggs. Bruise half a pound of common ginger, boil with the liquor, and then pour it upon ten lemons pared. When quite cold, put it in a cask, with two tablespoonfuls of yeast, the lemons sliced, and half an ounce of isinglass. Bung up the cask the next day; it will be ready in two weeks.