

Communications.

Our Washington Correspondence.

To the Editor of the Scientific American:

A patent was withdrawn from the issue of May 29 under the following circumstances: Mr. F. B. Hunt, of Richmond, Ind., applied for a reissue of letters patent No. 68,070, issued originally to Samuel Harpster (now deceased), August 27, 1867, which application was passed and the reissue dated May 29, 1877, and numbered 7,715. Mr. Hunt, immediately after the patent was allowed, issued notices to different manufacturers, warning them against infringing said patent, and furnishing them with a copy of the claims allowed. One of the manufacturers so notified, feeling satisfied that some of the claims of the patent were invalid for want of novelty, came on at once to this city, and employed counsel, who found a number of references to meet one, at least, of the claims, and thereupon applied to the Commissioner to withhold the patent, who, after examining the case and the patents cited as anticipating the claims, concluded to withdraw the patent from the issue, although it was already printed and signed; but as no seal was attached the document was not complete.

This case has caused a great deal of talk, because, first, the attorney who prepared the application for a reissue was the brother of the assistant examiner who has charge of the particular sub-class to which this application belonged; and secondly, the attorneys who opposed the case were formerly in partnership with the Commissioner. And although, under the circumstances of the case, he only performed his duty in preventing the issue of an invalid patent, the fact that he decided the case in favor of the party that employed his former partners has given the applicant and his friends grounds for considerable talk against the motives of the Commissioner in making the decision.

I see that it is being telegraphed all over the country that a patent has been granted to a gentleman in San Francisco for a method of telegraphing facsimiles of stereotype plates. There appears, however, to be nothing very extraordinary about this, it being only one of the many different styles of facsimile telegraph apparatus, but differing from the majority in using a stereotype plate for the "copy," which plate is filled up between the faces of the letters with a non-conducting substance that is very readily applied. The plate thus prepared is placed upon a cylinder arranged to revolve rapidly, so as to present each successive letter to fingers attached to a traveling frame. As the cylinder bearing the plate revolves, the frame gradually advances by the operations of a screw; and thus each and every line is successively presented to the fingers or magnetic points already mentioned. Necessarily the circuit is open when the points are passing over the non-conducting surface; but as often as the metal type presents itself to said fingers the circuit is closed, and the corresponding magnetic points or pens at the receiving station make the record there in the same letter as the original, delineated in a series of fine lines, either upon chemically prepared or ordinary paper, fixed upon a corresponding cylinder at said receiving station. There does not appear to be any very great gain in this system at present; but if some one will now devise some plan by which the instrument at the receiving station will be able to make a plate which will be an exact copy in relief of the original stereotype, it would appear that it would be a very valuable invention; for then the great daily papers could then issue their papers simultaneously in every large city in the country—which is something we may yet see.

Arrangements are now being made by the Ordnance Bureau of the Navy Department to convert a number of 100 lbs. muzzle-loading Parrott guns into breech-loaders, at the Parrott Foundry, near West Point. It is intended to place the guns so converted on some narrow beam vessels of the Alaska class. There is now being made for the Bureau at the Navy Yard in this city a number of breech-loading boat howitzers of 3 inches caliber; and it is hoped that every vessel in commission will soon be supplied with this class of weapons. The Trenton (the flagship of the European station) is the only vessel now supplied with them; but it is intended to furnish from one to three to each vessel, according to size. The Bureau finds itself unable to readily get any very heavy breech-loading guns made, for the want of any establishments in this country capable of making the heavy steel tubes which are essential for the lining of breech-loaders. The department is desirous of making some 12 inch rifles, weighing about forty tons, but there is no factory in the United States that is in a position to make even 8 inch gun tubes. Our ordnance officers do not think that such tubes cannot be produced here, but that not enough of them are wanted at present to make the manufacture of them profitable, unless the government should give an order for the making of enough guns to pay the manufacturer to furnish the necessary capital required for the plant capable of turning out such tubes. Some 11 inch muzzle-loaders have been converted into 8 inch rifles by inserting wrought iron tubes, which answer for muzzle-loaders, but not for breech-loaders. The former will do for seacoast and harbor defence, where there is room for working; but in cramped quarters, as on board ship, breech-loaders are the most desirable.

The War Department is considering a proposition to send one or more officers of the United States army to our legations in Turkey and Russia as military *attachés*, and to procure for them special permits to travel with the contending

armies, so as to make observations of their tactics. The officers are to be in constant communication with this government, so as to regularly report the progress of the campaign from the standpoints of both countries, and on their return to compile their observations into a final report for general information.

For several years the Bureau of Navigation has made strenuous efforts to obtain a sufficient appropriation to make a proper survey of parts of the Pacific Ocean, and especially the coast between San Francisco and the Isthmus, for the benefit of our commerce between those places. The necessity of a proper survey of the very locality where the Pacific Mail Company's steamship City of San Francisco was recently wrecked was very much felt, and it was proposed to make such survey. Estimates were prepared for that purpose to be submitted to Congress; but the late Secretary of the Navy did not think it advisable to ask Congress for any money for this purpose, and the survey could not therefore be made.

Mr. Dodge, the statistician of the Agricultural Department, reports, as the result of an investigation of losses from diseases of swine during the past twelve months, the discovery of the destruction of 4,000,000 animals of all ages—a money loss of more than \$20,000,000. It is intended that the department shall ask Congress for an appropriation to make an investigation to see if some remedy for this cannot be found.

The Chief of the Bureau of Statistics has published a statement that he has received information showing that there were exported during the month of April, 1877, 13,404,628 yards of cotton goods, valued at \$1,055,967, and of other manufactures of cotton \$144,539; in all \$1,206,506—an increase in value over April of last year of about 36 per cent. Of the exports in April, 1877, 43 per cent were shipped to the United Kingdom and British possessions—which appears like sending coals to Newcastle.

From a recent telegram received in this city respecting the Sutro tunnel, designed to tap and drain the Comstock lode, it appears that this great work now reaches 17,000 feet from its mouth, and it is expected that it will progress hereafter at the average rate of about 300 feet per month. The work has now been prosecuted for nearly eight years, at an average cost, it is said, of about \$1,000 a day. It is estimated that, in about ten months, it will tap the Comstock lode at the Savage mine; but it may take much longer, as some miners think that, when nearing the lode formation, the difficulties of tunnelling will be very much increased. Mr. Sutro, however, thinks they have passed through as bad material as they are likely to find in the future, and does not anticipate any serious trouble. Several quartz veins have been cut which have given tolerable assays; but the tunnel is not cut as a prospecting enterprise, and they therefore do not intend to turn aside from the main business of tunnelling until after the lode is reached.

Washington, D. C.

OCCASIONAL.

Germination of Seeds under Blue Glass.

To the Editor of the Scientific American:

Having procured two small tin boxes, and filled them with garden soil, I put into each box 6 peas (each pea weighing exactly 6 grains), and 6 kernels of popcorn, each kernel weighing exactly 3 grains. One box I covered with strips of blue and common window glass, the proportion of blue to common glass being about four to one. The other box I covered with common glass. I watered the contents of the two boxes once a day with the same amount of water, at the same temperature. At the end of two weeks I removed the earth from the young plants by gentle agitation in water, carefully dried them between sheets of blotting paper, and weighed them, with the following results:

—BLUE GLASS.—			—COMMON GLASS.—		
No.	Corn.	Peas.	No.	Corn.	Peas.
	grs.			grs.	
1	*	*	1	19.0	*
2	19.5	37.0	2	23.5	36.5
3	16.5	33.0	3	23.0	34.5
4	16.0	21.5	4	16.0	37.5
5	16.5	31.5	5	26.0	17.0
6	16.5	19.5	6	18.5	*
Total...	85.0	142.5	Total....	126.0	125.5
Average..	17.0	28.5	Average..	21.0	31.37
Increase..	14.0	22.5	Increase..	18.0	25.37

* Failed to germinate.

It will be seen that, after deducting the original weight of each, the average increase of the corn under the blue glass was 14 grains, while the increase of that under common glass was 18 grains, or four grains in favor of common glass. The average increase in the peas under blue glass is 22.5 grains, while under the common glass it is 25.37 grains, or 2.87 grains in favor of the latter. There was but little difference in the time of germination. The corn under the blue glass was streaked lengthwise of the leaf or blade, with deeper and lighter veins of green.

Woodstock, Ontario.

J. MONTGOMERY.

The Egyptian Prolific Cotton.

To the Editor of the Scientific American:

The writer recently received a circular issued by a rural grange, reciting the fact of the discovery and proposing to form a club to send and purchase some of the seed of a wonderfully prolific Egyptian cotton plant. Signor Giacomo Rossi, the "discoverer" of this wonderful plant, states that it grows to the height of 10 feet, and the original stalk produced 70 bolls. From results attained by planting picked

seed in small patches, and giving the plants special cultivation, a theoretical yield of 10 cantars of seed cotton per feddan (acre) is figured out for the new discovery. Now a cantar is a very uncertain unit of weight. In Palermo it is 44 lbs., in Rome it is 75 lbs., while in Alexandria and Cairo it is 45 lbs. scant. In Syria, the cantar means 450 to 500 lbs., or thereabout, being 10 Cairene cantars. Nowhere do I remember the cantar to have the value of 100 lbs., as stated in the article referred to. But taking it for granted that it is 100 lbs., we have a theoretical yield (which is never reached in practice) of 1,000 lbs. of seed cotton per acre—or just two thirds as much as is raised year by year on almost every single acre in this country, our average yield per acre being 1,500 lbs. seed cotton, or 500 lbs. lint cotton. Taking the results achieved by our best gins (on an average) the 1,000 lbs. seed cotton would make about 350 lbs. of lint—the usual yield of fair cotton land throughout the South.

This, however, is giving Signor Giacomo Rossi all that he claims theoretically, with figures of his own based upon results obtained by picked plants, and saying nothing about the difficulties in the way of getting cotton off stalks 10 feet high. The weed frequently grows that high here when it is neglected, and our planters sometimes have to "top," as it is called, hundreds of acres to prevent its growth to a height that would make picking inconvenient. Besides, the more stalk, after a certain amount, the less bolls. As to the results of special cultivation, I could refer you to the circulars of a half dozen different "prolific" cottons raised in different parts of the South, some of them with affidavits from our best citizens attached, setting forth the fact of 2½ and even 3 bales being raised from one acre—and that too on the red clay or sandy hills of Georgia. And granting that this original Egyptian stalk had 70 bolls on it, as claimed by Signor Rossi, that is no sign that plants grown from its seed will be equally prolific. On the contrary, all of our experiments—and they have been numerous—with "prolific," "improved," "multiplying," and other new kinds of cotton seed have proved to us that this plant is no exception to the general rule of atavism, and that in a generation or two, except under special cultivation, the plant generally reverts to the normal type of the plant produced in the country. Seventy bolls, however, are by no means a large number. On the plantation of James B. Best, about 2 miles from this point (Osceola, latitude 35° 42' 30" N.), I saw last year two stalks of cotton, upon one of which there were over 800 and on the other 1,000 "squares" and bolls (a square being a boll in process of development). All of this immense number did not come to maturity, owing to an early frost, which occurred on the first night of October; but had the plants had two weeks longer, almost every boll would have opened out. These plants were volunteers, and came up in exceptionally favorable spots. Mr. Best saved the seed to experiment with this season.

Osceola, Ark.

F. L. J.

The Seventeen Year Locusts.

To the Editor of the Scientific American:

In your paper of May 26, I see an article on the seventeen year locusts. In this section of the country they appear every thirteen years; and at alternate appearances there are many more than at the others. Thus, in 1829, every bush was loaded with them, and young trees were so badly injured by their sting that the woods in July showed many more dead than live branches. All young apple and peach trees were killed. In 1842, they again made their appearance, but not in such numbers as in 1829; yet many trees were permanently injured then. In 1855, they came again by millions, and did about as much damage as in 1829. In 1868 they again visited us in about the same numbers as in 1842. The next appearance here will be in 1891, when they will probably be as plentiful as in 1829 and 1855.

Chesterfield, Ill.

H. J. LOOMIS.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

The computations and some of the observations in the following notes are from students in the astronomical department. The times of risings and settings of planets are approximate, but sufficiently accurate to enable an ordinary observer to find the object mentioned.

M. M.

Positions of Planets for July, 1877.

Mercury.

On July 1, Mercury rises at 3h. 19m. A.M., and sets at 6h. 5m. P.M. On the 31st, Mercury rises at 5h. 57m. A.M., and sets at 7h. 56m. P.M.

Mercury should be looked for in the morning of the early part of the month. It is very small and not very easily found.

Venus.

Venus, although small, is easily found after sunset. It rises on July 1 at 5h. 43m. A.M., and sets at 8h. 35m. P.M. On the 31st, Venus rises at 6h. 54m. A.M., and sets at 8h. 24m. P.M.

Mars.

Mars is coming into better position. It rises on July 1 at 10h. 57m. P.M., and sets at 9h. 36m. A.M. the next day. On the 31st, Mars rises at 9h. 23m. P.M., and sets at 8h. 11m. A.M. of the next day.

Astronomers will look at Mars with great interest in September. The planet then comes into its best position; and it can be observed in the evening and early in the morning. Astronomers expect to be able to determine its distance by

observing how much its place changes when referred to the stars, by the change of position of the observer during this interval of time. The month of September will also be the best time for making drawings of the spots seen on the disk of Mars.

Jupiter.

Jupiter is, in July, the most interesting object in the skies. On July 1, Jupiter rises at 6h. 37m. P.M., and sets at 3h. 37m. A.M. of the next day. On July 31, Jupiter rises at 4h. 26m. P.M., and sets at 1h. 26m. A.M. of next day. Late in July, Jupiter comes to the meridian at 9 P.M., at an altitude of about 25°.

On July 4, at 9h. 30m. P.M., only three satellites of Jupiter will be seen, the first being in transit across the face of Jupiter; on the 7th of July, at 9 P.M., the largest satellite will not be seen, because it will be behind the planet; on the 8th of July the smallest satellite will be invisible, because it will be on the face of the planet; on the 20th and 27th of July the nearest satellite will not be seen at 9 P.M., because it is in front of the planet; the smallest will be invisible on the 24th, because it is behind the planet. On the 28th, a little after 9 P.M., a satellite will come out from the shadow of Jupiter. The best time to watch Jupiter, with a small glass, is when some one of the satellites is out of sight, as the re-appearance is very interesting.

Saturn.

On July 1, Saturn rises at 11h. 7m. P.M., and sets at 10h. 25m. A.M. of the next day. On July 31, Saturn rises at 9h. 7m. P.M., and sets at 8h. 23m. A.M. of the next day.

Mars and Saturn are in conjunction on the 27th, Mars being lower than Saturn in altitude. During the last week in July, Mars, Jupiter, and Saturn can all be seen at 10 P.M. Jupiter in the southwest, Mars and Saturn in the southeast.

Uranus.

On July 1, Uranus rises at 8h. 6m. A.M., and sets at 9h. 54m. P.M. On July 31, Uranus rises at 6h. 16m. A.M., and sets at 8h. P.M.

Sun Spots.

The report is from May 19 to June 15, inclusive. The observation of May 19 showed a large spot coming on, but clouds prevented another observation until May 24, when a group was seen near the center. The spot seen on May 19 had probably broken up to form this. On May 26 the group was visible, but was very faint, and on May 27 it could not be found. From May 28 to June 4 the disk appeared to be free from spots. On June 5 a group of large spots was observed on the eastern limb, but clouds prevented observations, and, when next seen, it was near the center. On June 13 it could not be found, and it must have disappeared after passing the center. At the present date, June 15, the disk appears to be free from spots.

DECISIONS OF THE COURTS.

United States District Court.—District of Connecticut.

AUGER PATENT.—RICHARD P. BRUFF, trustee, vs. WILLIAM A. IVES.

[In Equity.—Before Shipman, J.—Decided April 12, 1877.]

Shipman, J.:

This is a bill in equity, charging an infringement by the defendant of re-issued Letters Patent No. 5,624, dated October 21, 1873, which were issued to Richard P. Bruff, assignee of James Swan, for an improvement in machinery for manufacturing curved or gauge-lip augers. The original patent was issued to said Swan June 9, 1868. Since the suit was brought the patent has been assigned by the plaintiff and no injunction is now asked.

In the manufacture of augers the end of the bit-blank is first cut into a trident-like shape, and the body of the blank is then twisted into the form of an auger. The central prong at the end of the blank becomes the pivot of the auger, and the two other prongs become the floor-lips or cutting edges. Formerly, these cutting edges were formed by hand. The operation of bringing or drawing the cutting edges so as to start from the base of the screw, and to continue in a line with the axis of the thread upon the pivot of the auger, was a difficult one and required skilled labor. The patentee describes the object and nature of his invention as follows:

"In making augers or bits of the above description, namely, curved or gauge-lip augers, it is necessary to leave a sufficient thickness of metal at the bit to admit of the point or screw being formed, after which the lips require to be reduced and brought to a knife-like edge at their cutting parts, which process is termed upsetting, and has hitherto been done by hand; but the most skillful workman can scarcely obtain a perfect form of cutters, and perfect uniformity in the two lips is rarely ever obtained. In my invention I employ gripping or clamping jaws that grasp and firmly hold the auger blank just above the lip, the jaws being fitted to receive the helical threads of the auger blank, and, in connection with these jaws, swaging or drawing dies, to which is imparted a rotative movement while they are in contact with the lips of the blank, such rotative movement upsetting the auger lips and forming them to shape against the gripped dies."

The machine consists, in general, of two jaws, connected at one end by a pivot, which have dies inserted in their opposite ends, to receive and hold the screw portion of the auger while its cutters or lips are being operated upon. The specification describes the dies as follows: "The upper surfaces of the dies, B, B, are grooved or hollowed out to conform to the desired shape of the lips or cutters, as shown at C, C." An arbor is fitted upon the socket of a curved standard, which arbor rotates and moves longitudinally to and from the auger or bit. To the lower end of the arbor the swaging or drawing dies are fitted. These dies act upon the lips or cutters of the bit when the arbor is moved, and the lips are drawn out to a thin edge against the ends of the jaws by the rotative and forward action of the swaging dies. * * *

Decree in favor of the plaintiff for an accounting, and a reference to a master.

[The *as L. Ver ore and Benjamin F. Thurston*, for plaintiff.
Charles R. Ingersoll and John S. Beach, for defendants.]

Inventions Patented in England by Americans.

May 25 to June 7, 1877, inclusive.

BLIND FURNITURE.—C. De Quillfeldt, New York city.
CLOSING BAGS.—A. M. Underhill, New York city.
CORSET, ETC.—L. C. Werner, New York city.
CUTTING RAILS.—D. McCandless, Pittsburgh, Pa.
DREDGING MACHINE.—D. Moor, Waterville, Me.
FEEDING FILE CUTTERS.—H. B. Nickerson, Boston, Mass.
FOLDING PAPER, ETC.—S. D. Tacker, New York city.
HEATING CARS.—Car Heating and Brake Co., Albion, N. Y.
HORSESHOE MACHINE.—J. W. Chewning, Jr., Shadwell, Va.
HORSESHOE MACHINERY, ETC.—J. D. Billings, New York city.
LAMP.—G. Chappel, Brooklyn, N. Y.
LUBRICANT.—P. Sweeney et al., New York city.
ORDNANCE.—B. B. Hotchkiss, Paris, France.
FLIERS, ETC.—C. N. Thorpe, Philadelphia, Pa.
ROLLING MACHINERY.—A. Reese, Pittsburgh, Pa.
SASH FASTENER.—N. Thompson (of Brooklyn, N. Y.), London, England.
SELF-LUBRICATING JOURNAL.—P. Sweeney et al., New York city.
SPLITTING LEATHER.—J. A. Safford (of Boston, Mass.), London, England.
STRINGED MUSICAL INSTRUMENT.—M. H. Collins, Mass.
TWIST DRILL, ETC.—C. F. Jacobson et al., New York city.
URINAL.—J. W. Osborne, Washington, D. C.
WATER CLOSET VALVE, ETC.—F. E. Kernochan, Pittsfield, Mass.

Recent American and Foreign Patents.

Notice to Patentees.

Inventors who are desirous of disposing of their patents would find it greatly to their advantage to have them illustrated in the *SCIENTIFIC AMERICAN*. We are prepared to get up first-class WOOD ENGRAVINGS of inventions of merit, and publish them in the *SCIENTIFIC AMERICAN* on very reasonable terms.

We shall be pleased to make estimates as to cost of engravings on receipt of photographs, sketches, or copies of patents. After publication, the cuts become the property of the person ordering them, and will be found of value for circulars and for publication in other papers.

NEW AGRICULTURAL INVENTIONS.

IMPROVED MILK COOLER.

Elmore D. Bennett, Allegany, N. Y.—This invention relates to improvements in milk-cooling pans by which any quantity or mess of milk may be cooled separately from that in the remaining pans of the vat, the pans being cooled by spring water direct, or by water passing through an ice receptacle, the cold water being conducted around the pans, and drawn off at the end. A water vat is provided with any number of pans resting on cross pieces, and retained by fastening devices in the vat. The cold water is agitated by one or more rubber-lined partition strips, that are set laterally across the pans, and the vat divided by detachable partition strips into several vats, as required.

IMPROVED FRUIT DRYER.

William S. Plummer, Portland, Oregon.—This is an improved apparatus for drying fruit, so constructed as to enable large quantities of fruit to be dried at the same time, the drying being done quickly and evenly. The firebox, into which fuel is inserted through a chute, leading in through the lining and case, and which is provided with a door at its outer end. Upon the top of the firebox is formed a square drum, which projects beyond the sides of the firebox and has pipes passed through and secured in holes in the top and bottom plates of its said projecting parts, so that the flame of the fire may circulate around the pipes and heat the air passing through them. The smoke and other heated products of combustion pass into a coil which passes around the drum, and from which a pipe leads out through the lining and case.

IMPROVED CORN PLANTER AND GRAIN DRILL.

John L. Hill, Climax, Kan.—This machine is convertible, being adapted for use both as a corn planter and drill. When used as a cultivator suitable adjustment brings the concave sides of two inner cutters of each set inward to move the soil toward the plants, and the concave sides of the outer cutter of each set outward to hold the cutters against lateral movement.

IMPROVED SULKY ATTACHMENT FOR PLOWS.

William K. Bushnell, Burlington, Wis.—This improved sulky attachment for plows is so constructed as to leave the plow free to run in and out of the ground, to prevent it from wobbling, and to enable it to be readily controlled.

IMPROVED HORSE HAY RAKE.

John Badger, Belvidere, Ill.—This embodies improvements in horse hay rakes, by which the hay is cleaned completely from the rake teeth in dumping, and the teeth locked into rigid position when in operation, and readily adjusted to different heights from the ground.

IMPROVED HARROW.

David McIlrevey, Riceville, Iowa.—This harrow is so constructed that it will adjust itself to any unevenness of the surface of the soil. It cannot injure the horses or the driver by being thrown against them, and may be readily adjusted into a large or a small harrow, as required.

IMPROVED GRAIN SEPARATOR.

Louis V. Davis, Elkader, Iowa.—This is an improved grain separator of simple construction, which is mainly designed for the purpose of cleaning seed grain, so that the best and heaviest grain only may be employed for seeding. A novel feature is the combination with the trunk of a horizontal fan casing and air passages, said fan being arranged directly above said air trunk, so that its casing may serve to deflect and divide the ascending current, as set forth.

IMPROVED TRANSPLANTER AND FERTILIZER.

John H. Nolan and Benjamin Fitzpatrick, Chambers county, Ala.—The operation of this improved apparatus is as follows: The tube is filled with a fertilizing liquid, and a plant is placed on the ground. One handle is grasped by one hand and another handle by the other. The instrument is forced into the earth, carrying the plant with it by means of the hook. The rod is now drawn upward until the valve closes the tube and a second valve is opened, permitting a quantity of the fertilizer to escape. The valve is allowed to close when a handle is moved downward, forcing wings together, and carrying the earth around the plant.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED ELECTRO-MAGNETIC BOILER-FEED REGULATOR.

Richard A. Hays, Elgin, Ill.—This invention consists of a lever connected with a steam supply valve of a boiler-feed pump, or with a valve in the water supply pipe, and with the armature of two series of electro-magnets, the said magnets being connected with a relay, which directs the current through either series as may be required. When water is at the required level in the boiler, a float supports a spindle so that a guide touches a rod, completing the electrical circuit of the battery, exciting the relay magnet so that its armature is drawn toward it and into contact with the post. By this means a circuit is established, and the long arm of a lever is drawn toward a valve, which is thereby nearly closed, and remains so as long as the current is unchanged and the steam pump is only normally active. When the water drops in the boiler the float falls, and the current through the wires is broken, and the spring breaks the battery connection with the magnets and draws the long arm of the lever from the valve, opening the valve and admitting steam to the feed pump, which works with increased rapidity until the required water level is attained.

IMPROVED STEAM PLOW AND SCRAPING ATTACHMENT TO CARS.

Samuel T. Shankland, Laramie, Wyoming Territory.—This invention is an improved steam plowing and scraping attachment to cars, by which the plowing and scraping can be accomplished simultaneously with any number of plows or scrapers at both sides of the track, and thereby the work executed by the power of a locomotive with few hands. It consists of a car with a centrally pivoted plow crossbeam, having hinged scraper beam extensions. A second car, with sliding beams guided in side boxes of the first car, is moved forward and backward by a locomotive, and operates by chains attached to the ends of sliding beams and drawhead of the movable car, a number of scrapers to and from the track, to carry the dirt up to the track after the ground has been plowed by the direct action of the locomotive and plows of crossbeam.

IMPROVED CAR AXLE BOX.

Richard B. Eason, New York city, assignor to himself and Silas A. Allen, of same place.—This consists of a car axle box having a flanged oil chamber or receptacle with an exit spout coming in contact with the packing of the journal. The oil receptacle turns in bearings of the box, to bring the exit tube below a top opening for filling the same with oil. On turning

it down again it is secured in position by a fastening bolt at the top passing through an extension flange of the receptacle.

IMPROVED SAND PUMP REEL.

William J. McKee, Petrolia, Pa.—This consists of the drive wheel of a sand pump reel, having rim, spokes, and hub in one piece, and provided with ears, rods, and nuts at the end of rods. By means of the nuts on the threaded portion of these rods the wheel may be drawn upon the tapering portion of the shaft as tightly as may be desired.

IMPROVED ALARM LOCK.

George W. Graham, Grand Junction, Tenn.—This invention consists of toothed bolts, moving at right angles to each other when engaged by a cog-wheel turned by a key after the common spring bolt is withdrawn. The vertical bolt lifts the crossbar and rings a bell on opening.

IMPROVED PUMP.

Jeremiah F. Furnas and William W. Furnas, Dysart, Iowa.—This device may be used either as a force or lifting pump at pleasure. It is made to answer both purposes without stuffing boxes. The piston and cylinder are submerged, which renders it unnecessary to prime it, and obviates freezing.

IMPROVED SURGE RELIEVER FOR STEERING APPARATUS.

Robert M. Mountfort, Brunswick, Me.—This invention is intended to prevent the twisting off of the rudder from the rudderhead by the pressure or power of the waves dashing on the rudder; and it consists of cushioning devices attached to the tackle blocks at both sides of the rudderhead.

IMPROVED HOISTING AND CONVEYING APPARATUS.

Francis A. Clarkson, Black Brook, N. Y.—This apparatus for hoisting and conveying coal, casks, and other articles, is so constructed that it may be shifted laterally, as may be required. It embodies several new and ingenious devices calculated to add to its strength and efficiency, but which cannot be intelligibly explained without the aid of drawings.

IMPROVED MACHINE FOR PUNCHING AND SHEARING METAL.

Alfred Lee, Forest Grove, Oregon.—This invention consists of a toggle joint and two hand levers, and a peculiar arrangement of links for connecting the same, in combination with a punch and shears. By moving either or both of the levers the toggle joint is straightened, and the jaw moved downward with sufficient force to shear metal placed between the jaws, or to punch anything placed on the die in the recess in the standard.

IMPROVED NEEDLE CLAMP FOR SEWING MACHINES.

Joseph V. Morton, Winchester, Ky.—This invention consists in the arrangement of a clamping bolt, having a head for clamping the needle, and a shank that extends into a transverse hole bored in the lower end of the needle bar. It is notched to engage a wedge-shaped projection on a rod that extends upward in a hole bored longitudinally through the needle bar, and is capable of being drawn upward by a milled screw at the top of the needle bar, so as to draw the clamping bolt into the bar and clamp the needle.

IMPROVED BOILER.

Robert Excell, Chicago, Ill.—This is an improved boiler for heating greenhouses, etc. Arched pipes are provided, the lower ends of which are connected with holes in the lower parts of the inner wall of the boiler. The pipes pass up along the inner wall of the boiler, and their upper ends are connected with a larger pipe passing longitudinally along the crown arch of the inner wall of the boiler, and its forward end is connected with a circulator.

IMPROVED DEVICES FOR CUTTING AND PUNCHING SHEET METAL FOR CURVED PIPE ELBOWS.

Greene Choate, East Saginaw, Mich.—Two inventions. In the first the bed of the shears has a cutting edge which is formed on an ogee or reversed curve. Arms project from the bed, and to them the arms of the curved shear blade are pivoted. The curved shear blade is the counterpart of the curved cutting edge of the bed. Eyes project downward from the arms of the shear blade for receiving rods that connect the same with a foot lever. A spring is attached to one of the arms and bears against a projection for throwing the curved shear blade upward. A sheet of metal, having been punched by another machine, is placed upon the bed of the shears, with two of its perforations on registering pins, when the curved shear blade is forced down by means of a foot lever, and the sheet is severed along the line of the cutting edge.

The second device consists of a table having arranged across one of its ends a series of dies, a guide containing a gang of punches fitted to the dies, and a lever for driving the punches.

IMPROVED TILE MACHINE.

George S. Clark and William M. Pursell, of Piqua, O., assignors to said Clark and John O'Ferrall & Co., of same place.—This invention relates to the shaft and journal boxes of the machines; and it consists mainly in the combination of a square or polygonal shaft with collars that form the journals of the same, and with journal boxes and their supports.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED CAR HEATER.

Edgar O. Huntington, Saginaw City, Mich., assignor to himself and Sanford S. Perkins, of same place.—This relates to that class of car heaters which are suspended below the bed frame of the car and charged from the outside of the same. It consists of a stove surrounded by a casing, to which air is supplied through side registers, to be heated up and transmitted, through drums with registers, to the interior of the car.

IMPROVED DRAFT EQUALIZER.

Levi W. Frederick, Hall, Ind.—This is a simple evener that may be used for two or more horses. It can be readily adjusted to distribute the load evenly between the horses, permits of the easy movement of each horse, and may readily be shifted to accommodate the required number of horses.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED SAFETY ATTACHMENT FOR POCKETBOOKS.

Thomas Ferguson, Parkersburg, Iowa.—This is an attachment for pocketbooks of all kinds, by which the same may be secured easily to the pocket lining in such a manner that it cannot be withdrawn except by first releasing the fastening device. It consists of a base plate attached to the pocketbook with a sliding pin that enters raised guard sockets of the base plate and attaches the pocketbook to the lining by being passed through the same.

IMPROVED FURNITURE SPRING.

John H. Dustan and Daniel W. Akin, Spartansburg, Pa.—This consists of a bed bottom consisting of longitudinal plate springs that have ends meeting, lapping, and fastened together subjacently, their continuity enabling them to sustain the spiral springs.

IMPROVED HORSESHOE.

José R. Cancio, Pol, Spain.—This horseshoe is applied to the hoof by means of a metallic band, of a suitable width and strength, which may be lined with leather or other material at the under side, so as to produce a tight frictional contact with the hoof. The shoe and band are connected with each other by front and lateral straps, which are riveted to the calks and secured by eyes and fastening screws at their upper ends to the band.