a tool as that is the son and offspring of steam, either in smelting the ore from which it was made or in forging it. Upon the banks of busy streams, and in the solitudes of the primeval forests, the song and chirp of this agent, steam, is loudly heard. Even the water wheel, which disputes a little part in the list of motors, owes its increased efficiency and its greater power to the better facilities for manufacturing through the employment of steam.

There is no corner or quarter of the globe, known to man, where it has not penetrated. The icebergs of the Pole have overlooked its toil, and cast their shadows athwart its funnel, whitened by the salt air and furnace heat; the waters of the northern seas have lent their drops and globules to be evaporated and aid man in penetrating into unknown solitudes; and the fierce heat of the tropics has heated the bearings and dried out the oil from the steam engine until they have screamed again. Everywhere—in all lands and habitable places—its wreaths are seen twining and coiling in the air, and finally disappearing entirely; and lately, in Japan, through the exertions of Commodore Perry, a little locomotive carried upon a circular railroad a throng of wondering and pleased Japanese. It is an assertion that cannot be disputed, to say that it is the very emblem and symbol of peace and prosperity. When the steam engines are the most rapid in their revolutions, and when their number and sum increase in quick succession, then do the papers teem with joyous accounts of prosperous harvests, groaning warehouses, and full freights; then are all men busy, and the voice of complaint and the piteous cry of want are unknown in the land. In all its various operations, whether in swinging the ponderous beam of the steamer slowly and steadily to-and-fro, whether heaving the piston regularly up-and-down through all the wrath and tumult of the elements, urging the vessel on, and trampling even the might of the seas beneath its resolute beat and stroke, it is still the object of unflagging and never-ceasing interest. In careful and experienced hands—careful, beyond every other consideration—there is no limit nor bound to its range, and man need not enumerate the catalogue of its operations to praise it; the *results* are enough. The fires of sacrifice that burned of old on altars and hill tops no longer gleam and startle the terrified people with the victims' shrieks and cries; but, through all the night, and through the summer's heat and winter's cold, the genial furnace-fires flame and burn, and render good return to man.

DEFALCATION OF THE POSTMASTER OF NEW YORK.

On Saturday, May 12th, it was discovered that Isaac V. Fowler, Postmaster of New York, was in arrears in his payments to the department to a large amount, variously stated at from $155,000 to $176,000. This is particularly startling as being the first considerable defalcation (except one or two in California during the confusion of its early settlement) which has occurred among the officers of the United States government since the passage of the Sub-treasury Bill. Previously to the adoption of that measure it was customary for these officers to use the government moneys in their hands temporarily for their own benefit, paying them over punctually at the stated periods of settlement. But numerous defalcations having occured in consequence of the government funds having been invested in enterprises which proved unprofitable, a provision was embraced in the sub-treasury law making it felony for any custodian of the public money to use it for any period, however short, for his own benefit. The wisdom of that enactment, so manifest in itself, has been abundantly proved by its operation in practice, having almost wholly prevented the occurrence of defalcations. It seems even that Mr. Fowler's would not have taken place, had he not been allowed to violate this provision of the law. It is said that most of the large sums which he has used and is unable to repay have been lost in unprofitable speculations. The *Tribune* says—"The following appear to be some of the speculations in which he has failed: real estate operations; shares in Pennsylvania coal companies; shares in the Empire City Bank, by which he lost $20,000. The only profitable investment seems to have been in a patent right for manufacturing wire sofa and other springs."

LITERARY AND SCIENTIFIC NOTICES.

NEW AMERICAN CYCLOPÆDIA, VOL. IX.

It has been well said that the possession of a good cyclopædia has more influence in elevating the social position of a man and his family than the investment of an equal amount in any other form of property. And it may be added that there is no other portion of a man's possessions from which he can derive so large a measure of the noblest and most durable enjoyment and satisfaction. Next to our schools and newspapers, we believe that the old "Encyclopædia Americana" has been the most valuable boon that has yet been bestowed upon the mind of this country. But in the swift progress of science, arts and events, that publication has nearly lost its value, and the Messrs. Appleton judged rightly that there was a demand in the community for another work of a similar character. We rejoice that the enterprise of supplying this demand has been undertaken by such competent hands, and we congratulate the editors on the ability, the learning and the capacity for the kind of writing required, which they have been able to marshal for the composition of this great work.

The new cyclopædia is to consist of 15 or 16 volumes, each containing 700 or 800 pages, and costing three dollars. It will thus be a very cheap work in proportion to the amount of matter which it contains, and will constitute a complete library in itself, with the several subjects arranged in alphabetical order, so as to he readily found as attention is called to them by either reading, conversation or reflection. The ninth volume contains more than 1,300 articles, and the following list will give an idea of the immense variety of the subjects:—Heart, Heat, Herod, Hessian Fly, Henbane, Hippopotamus, Holy Alliance, Holy Water, Holy Week, Homer, Homestead, Honey, Robin Hood, Hop, Horse-breaking, Horse-power, Hot-bed, Hour Circles, Henry Hudson, Howitzer, Alexander Humboldt, David Hume, Husband and Wife, Hustings, Hydraulic Ram, Hydrogen, Hydrophobia, Hymen, Immaculate Conception, Inquisition, Language of Ireland, Itch, Andrew Jackson, Japan, Language of Japan, Japanning, Jaundice, Jersey City, Jelly and Sir Jamsetjee Jejeebhoy.

All of these articles are written by persons familiar with the subjects of which they treat, and some single articles are really worth the cost of the whole volume. For instance, the plain treatise on the legal relations of husband and wife, by the learned Professor Parsons, not only gives the common law principles which govern these relations, but adds a summary of the modifications of the common law on the subject which have been made by the statutes of the several States; showing, in the briefest space, the rights of women in regard to person and property in the several parts of the country. We have examined several of the articles in this volume on subjects with which we are familiar, and find them, like those in previous volumes, admirably written. The "New American Cyclopædia" is exactly adapted to the perpetually recurring intellectual needs of the great mass of educated families throughout the country.

THE EDINBURGH REVIEW. Re-published by Leonard Scott & Co., this city.
The number of this periodical for the present quarter contains several very able essays, among which the best is, perhaps, one on "Education in England," and the other a scientific criticism of Professor Darwin's work on "The Origin of Species." This periodical is the oldest of its cl s in Great Britain; but although many of its old contributors are dead, they are well represented by the vigor, ability and independence of their succesors.

THE MATHEMATICAL MONTHLY. Published by Ivison, Phinney & Co., this city.
The May number of this magazine continues the discussion of the problem of probabilities. There is occasionally something in this purely intellectual periodical which is applicable to real life; for instance, the note on co-factors, by Pliny Earle Chase, of Philadelphia, in this number, might be sometimes used for reckoning dollars and cents.

THE WESTMINSTER REVIEW. Re-published by Leonard Scott & Co., this city.
The April number of the Westminster has a timely article on Japan, which moves through the subject in the methodical, clear, thorough and able manner characteristic of the great English reviews.

DINSMORE'S RAILROAD AND STEAM NAVIGATION GUIDE. Published by Dinsmore & Co., No. 9 Spruce-street, this city.
This old, useful and reliable publication is out in a new dress, and is the neatest and cheapest work of the kind published. It contains tables of the distance between the stations of all our railroads, the time of starting the trains, fares, &c.; also the time of sailing and routes of steamboats. It is a necessary hand-book to every traveler.

REVUE UNIVERSELLE. E. Noblet, editeur, Paris et Liege.
We have received the first number of the four h volume of this work. It is devoted to mines, metallurgy, public works, sciences and arts applied to industry, and appears to be very ably edited. We shall transfer to our columns such of its articles as we think will interest our readers.

THE QUARTERLY JOURNAL OF AGRICULTURE. Published by the United States Agricultural Society, at Washington, D. C.; edited by Benj. Perley Poore, secretary of the society.
The first number of the eighth volume of this standard work is almost entirely filled with lectures and articles by men eminent in agricultural science.

AMERICAN INVENTIONS IN EUROPE.

The following useful inventions made by our countrymen have recently been introduced in England and patented through the foreign office connected with the Scientific American Patent Agency:—

American Steam-heating Apparatus.—The *Rhadamanthus* steam frigate has been ordered by the British Admiralty to be fitted with the Wethered steam arrangement for her engines. This consists in using combined saturated and superheated steam. The system in this case is an experimental one; £900 being appropriated for the purpose. Before receiving the apparatus, she is to be fairly tested as to speed and consumption of fuel by her present arrangements, so as to judge fairly of the gain which may be secured under the use of the improvement. An increase of speed, with a saving of 40 per cent of fuel, is promised.

Sewing Machine.—Invented by H. W. Hayden, of Waterbury, Conn. It relates to the formation of the lock stitch, an improved device for taking up the slack of the thread, and a new contrivance for feeding the cloth.

Weighing Machine.—Patented by John Howe, Jr. and Frank E. Howe, both of this city. The invention relates to improvements in the supports, joists and levers of platform balances. This is a very excellent scale and it is having an extensive sale in this country.

Fire-arm.—Patented by Charles T. Pierson, of this city. This invention consists in encompassing the cone or nipple of the fire-arm with a cup, and attaching a collar packed with india-rubber to the hammer, to protect the percussion powder from moisture and prevent accidental discharge of the gun.

Apparatus for Blowing-off Water from Steam Boilers.—Patented by James H. Washington, of Baltimore, Md. The blow-off pipe has a hinged joint and float so as to keep the opening in the same position in relation to the surface.

Tailors' and other Shears.—Patented by James H. Roome, of this city. This invention consists in combining one limb of a pair of shears with a handle forming part of a separate lever, and of combining the said limb and handle with the other limb of the shears, whereby the leverage exerted by the thumb or hand, in cutting, is gradually increased as the shears close, and a drawing cut is produced.

Variable Cut-off Gear for Producing Expansion in Steam and other Motive Engines.—Patented by Foster, Sutton and Stephens, of Harlem, N. Y. A compound cam, composed of two parts yoked together, is applied to the main shaft and controlled either by a governor or by the engineer.

Machinery for Cutting Corks.—Patented by Edward Conroy, of Boston, Mass. This machine was described and illustrated on page 345, Vol. I. (new series) of the SCIENTIFIC AMERICAN, and was alluded-to, favorably, in an extract from a British cotemporary, published on page 250 of the present volume.

Revolvers and Bullets for the same.—Patented by John Walch, of this city. Two charges are placed in each chamber, one forward of the other; both being fired before the breech revolves.

Salinometer Case for Steam Boilers.—Patented by Joseph Grice, of this city. A vessel is interposed between the boiler and the salinometer case, for the passage of the steam, to prevent ebullition in the salinometer case.

FOREIGN NEWS AND MARKETS.

Steam Frigates.—Steam was introduced into the Royal Navy of England in 1822, and now two-thirds of all the war ships are steamers. The screw was introduced as the propelling agent in place of paddle wheels, in 1842; now there are 345 screw sloops and frigates, and 48 line-of-battle ships, having a power capable of moving them in a calm at the rate of from 10 to 15 knots an hour. The activity lately displayed in the British dockyards has led to such an increase of war steamers that the fleet is now equal to the fleets of France and Russia combined.

Miscellaneous Matters.—The wages of the operatives in the cotton factories of Bolton have been advanced 5 per cent, which brings them up to the Manchester standard. The steamship *Great Britain* (once wrecked in Dundrum Bay) made a recent voyage from Liverpool to Melbourne in 55 days and 16 hours—the quickest time on record between the two places; the total length of

the voyage being 13,405 miles; the average speed was 275 miles per day. The demand for crinoline wire in Sheffield has greatly fallen off, but the best quality of steel wire for ropes is in good request. The metal market is quiet, and almost without change in prices.

WEEKLY SUMMARY OF 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:—

HYDRAULIC MOTOR.

This motor consists of a cylindrical chamber with two gates, a central hollow shaft and a snail-shaped piston. The shaft is divided by a horizontal partition; so is the snail-shaped piston. The shaft has a supply opening above the partition, and a discharge or exhaust opening below the partition. The piston has an opening at front above its partition and one at back below the partition. The water under pressure passes down the hollow shaft through the piston, and, by its direct pressure, moves the piston round. As soon as the force of the water is spent, one of the gates opens and the dead water exhausts through the back of the piston and passes off through the lower part of the hollow shaft. We have seen this motor in operation, and we think it a most excellent contrivance; it being portable and capable of being attached to the hydrant pipes of buildings, and operated by the water flowing through the same. As a small power for single lathes and like machines it will be found very convenient, and as a power for pressing tobacco its advantage will be very great. Wm. Kennish, of London, England, is the patentee.

KNITTING MACHINE.

This invention consists in so applying and operating the frame needles, rib needles and sinkers of a ribbed knitting machine, that after the sinkers have given the loops to the frame needles, the rib-needles take the loops directly from the sinkers at the back of the frame needles. It also consists in the construction of the sinkers of a ribbed knitting machine with recesses in which the needles are arranged to operate, and across which the loops are extended in such a manner that the needles have their operation greatly facilitated. It also consists in the novel construction of, and mode of applying, pressers in combination with bearded needles, whereby they are caused to operate upon the needles in a proper manner by the movements of the needles themselves. It also consists in a novel mode of applying and operating two fingers in combination with the selvedge needles of straight knitting machine to aid them in forming the selvedge. And it further consists in an improved mode of driving the yarn guide of a straight knitting machine. The credit of this contrivance is due to John Chantrell, of Bristol, Conn.

KNITTING MACHINE.

The knitting of hosiery with properly-shaped heels and toes by the continuous operation of a machine without stopping to adjust the work, is something which has often been attempted by many ingenious mechanics, but we believe no machine has ever been made to do it successfully, up to the time of the invention of the improvements of W. H. McNary, which form the subject of the claims which appear in this week's list. These improvements, which are of comparatively simple character, effect this desirable result in a very perfect manner. The claims explain the nature of the invention as well as can be done without an illustrated description. The patent is assigned to the McNary Knitting Machine Company, whose office is No. 5, University Building, this city.

This invention has been also patented in several European countries, through the Scientific American Patent Agency.

FLOCK-CUTTING MACHINE.

The object of this invention is obtain a machine that will operate rapidly in cutting flock, perform the work perfectly, and at the same time be capable of being so adjusted as to admit of the ready discharge of foreign substances without injuring the cutting device. The tock from which flock is prepared, being most generally, the refuse from cloth and woolen manufactures, is liable to contain foreign substances such as nails, bits of metal and the like, which are a great detriment to the cutters of a flock-cutting machine, and hitherto the keeping of the cutters of such machines in perfect order, has been attended with considerable expense which is obviated by this invention. The inventors of this improvement are J. Tilton and E. Ritson, of Sanbornton, N. H.

MOLDING MACHINE.

The object of this invention is to obtain a machine by which green-sand molds for casting pipes may be expeditiously formed, and the pipes cast in a vertical position, the difficulty hitherto attending the shrinking and bending of the cross-bar avoided, and the mold enabled to be formed at its ends with male and female screws, so that the pipes may be cast with the same. The invention is applicable to the forming of molds for cylindrical, polygonal, elliptical or other shaped pipes. This improvement was designed by William Doyle, of Albany, N. Y.

GRAIN-WEIGHER.

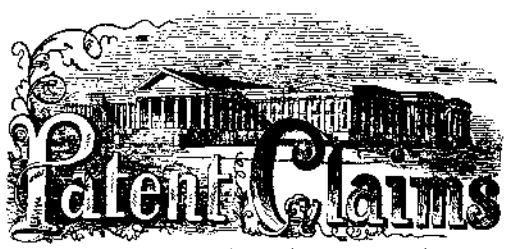
This invention consists first, in hanging the scale or receiver which is to contain the grain while it is being weighed, on one end of the scale beam in such a manner that it will tilt and discharge its contents at a given time, and then return to its former position for receiving another supply; and it consists in suspending said receiver or weighing box to the scale by a weighted lever having its fulcrum or center of motion in the end of this beam; and in adjusting the weight on the lever so as to give a slight preponderance to this end of the lever, and thereby insure the return of the receiver after discharging its contents, to a proper position for receiving and holding the grain flowing from the hopper, until the desired weight is attained, when it will be instantly discharged by the preponderance of the opposite end of the weighted arm. It consists, second, in combining with a weighing box suspended on the end of a weighted arm, having its fulcrum in the end of a scale beam, a novel device for operating and regulating the flow of grain from a hopper to the weighing box, whereby the discharge and cut-off may be automatically effected, and with an upward movement of the gates or valves which are operated, so as to close alternately in supplying the grain from the hopper to the receiver, and opened simultaneously by the return of the receiver after the discharge of the measured quantity. It consists, third, in combining in a novel manner with the two-throated hoppers and the manner of affecting the cut-off of the grain from the hopper to the receiver, a secondary weight which is brought into action after the first discharge is cut off, so as to allow the second discharge to charge and tilt the receiver, thus obtaining a nicety and accuracy in the filling and discharging of the receiver at the instant the required weight is attained. The device has been patented to Lovett Eames, of Kalamazoo, Mich.

PAINT-MIXER.

The nature of this invention consists in a novel arrangement of fixed knives or blades in the bottom of a tub with revolving knives, or knife-edged arms, fixed to a rotary arm, driven by suitable machinery, whereby the paint will be thrown towards the circumference of the tub and receive a thorough mixing action from the arms, and at the same time the movable and fixed arms will be arranged in such relation to each other that they will pass each other in pairs at equal distances from the center of the shaft, and diametrically opposite each other, and not pass between any two pairs in the tub at the same time, and under the same circumstances. The object of this invention is to give to the semi-liquid contents of the tub a thorough mixing by the action of the fixed and revolving arms, at the same time to equalize the operation of the revolving arms by preventing more than two of these from passing each other at the same moment. The patentees of this invention are C. W. Brown and G. W. Banker, of Boston, Mass.

MOLDING SHOT AND SHELL.

This invention consists in the employment for adjusting the pattern of a mold-board with a central aperture to receive a circular projection on the under side of the pattern, and with a circular flange on one, and a rim on the other side, to fit on one side over a rim turned to the end of one of the semi-flasks, and on the other into a flange projecting from the end of the other semi-flask, said rim and flange in the semi-flasks being at the same time so arranged that they serve as guides for the flasks when the same are connected; and this invention consists also in combining with the flanged end of the lower semi-flasks a cross-shaped gage with a half circular recess for the purpose of adjusting the core. The credit of this invention is due to David Huestis, of Cold Spring N. Y.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING MAY 15, 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.

28,245.—Wm. Clare Anderson, of St. Louis, Mo., for an Improvement in Lifting Jacks:

I claim the rack-bar, B, and the lever, C, the latter being provided with an oblong slot, e, through which and the upper part of the bar, B, the fulcrum pin, D, passes, the rack-bar being fitted in a stand, A, or equivalent device, to operate as and for the purpose set forth.

I further claim, in connection with the lever, C, and rack-bar, B, arranged as shown, the lugs or projections, g, attached to the lever, and at such a distance from the bar, B, to operate as specified.

[This invention consists in the use of a hollow stand or upright, provided with a base and a pawl at its upper end, and having a rack bar fitted within it, to the upper part of which a slotted lever is attached in such a manner as to raise the article to which it is applied, and to remain permanent after raising the article by the weight of the article alone; no other adjustment of the lever being required.]

28,246.—Luther Atwood, of New York City, for an Improvement in Construction of Apparatus for the Re-distillation of Coal Oils:

I claim a separating chamber, constructed substantially as described, when arranged and combined with a volatile oil still and condenser, in such manner as to gradually separate and condense the heavier parts of the oleaginous vapors formed, and continuously return them to the still, for a further action of the heat, and at the same time preserve the lighter vapors, and pass them over to the condenser, substantially as described, and substantially for the purposes set forth.

28,247.—I. A. Benedict, of West Springfield, Pa., and G. W. Cummings, of Conneaut, Ohio, for an Improvement in Ditching Machines:

We claim, first, The arrangement of the sleeve, G, sliding shaft, F, in combination with adjusting arms and segment gear and pinions, in the manner and for the purpose described.

Second, We claim the adjusting guides, O O', and guides, P P', in combination with the movable buckets, M, when arranged and operating conjointly, in the manner and for the purpose set forth.

Third, We claim the springs and levers, in combination with the revolving hinged buckets, M, in the manner and for the purpose specified.

28,248.—Dana Bickford, of Westerly, R. I., for an Improved Compressed Air Engine:

I claim one or more reservoirs for compressed air, with movable air-tight head, to be operated with either weight, screw, lever, spring or any similar power, for the purpose of keeping up a uniform pressure upon the contained air, combined with an engine, of any form, for the purpose of propelling vehicles or machinery, the whole constructed, arranged and operating substantially as set forth.

28,249.—J. S. Black, of Bloomfield, Ky., for an Improvement in Bee-hives:

I claim the combination and arrangement of the bee palace, constructed as described with the moth trap constructed as described for the purpose set forth.

[This invention consists in constructing the bee palace with two central or main chambers, two side gums or chambers, two top chambers and a moth trap. The top and side chambers serve for the bees to commence their work in, and the main chambers serve for them to extend their operations. The moth trap serves to catch all the moth or enemies of the bees, which are caused to fall down from the main work chambers by the attack of the bees. This appears to be a good palace for the queen and her co-workers.]

28,250.—Wm. N. Brown, of Camden, N. J., for an Improvement in Vapor Burners:

I claim the combination of a heat conductor, with a non-conductor, in hydro-carbon vapor burners, for the purpose of securing to the heat conductor the greatest possible heat-conducting power, by employing a metallic heat conductor, encased in a non-conducting or partially non-conducting material, as described, and for the purpose set forth in the above given description of my invention, and in the drawings hereunto annexed, or any other mode substantially the same, and which will produce the intended effect.

28,251.—Andrew Buchanan, of Jersey City, N. J., for an Improved Arrangement for Balancing Slide Valves of Steam Engines:

I claim, first, The combination with a slide valve, to which the steam is admitted from the under side of a valve, A, arranged with a stem, D, and enclosed into steam-tight chamber, C, substantially as and for the purpose specified.

Second, The arrangement of the cap, F, with legs, e, and fitting on a seat, c, around the hollow stem, D, in combination with the valve, A, constructed and operating substantially as and for the purpose described.

Third, The arrangement and combination of the valve, A, movable seat, B, cap, F, and regulating pins, f, constructed and operating substantially as and for the purpose set forth.

Fourth, The arrangement of the pipe, G, communicating with the steam chest through the chamber, C, substantially in the manner and for the purpose described.

[The object of this invention is to regulate the pressure of the steam on the upper and on the underside of a slide valve, according to the difference between that portion of the under surface of said slide valve which is exposed to the pressure of the steam and the entire upper surface of the valve; and this device is more particularly applicable to that class of slide valves in which the steam from the boiler acts on the underside, thereby producing a tendency to lift up the valve and cause a leakage of the steam.]

28,252.—A. L. Currier, of Washington, D. C., for an Improved Saw-set:

I claim, first, The construction and arrangement of a series of rotating punches and their corresponding matrices working together, to set the teeth of saws alternately to the right and left at the same time, thereby completing the operation, by passing it once through the operation.

Second, I claim the upright guides, the adjustable slide, B, to regulate the degree of set in saws, in combination with the rotating punches, as described, for the purposes specified.