

FIRST NEW ENGLAND IRON WORKS.

The first works for smelting iron ore in this country were erected in 1619, on a branch of the James river, Va., but were destroyed by hostile Indians in 1622. Bishop's "History of American Manufactures," says, that in November, 1637, the General Court of Massachusetts granted to Abraham Shaw one half the benefit of any "coles or yron stone which shall bee found in any comon ground which is in the countrye's disposing."

Discovery was early made at Saugus, or Lynn, of the Bog Iron ore, which is deposited in numerous peat bogs throughout Eastern Massachusetts, and supplied the early furnaces of that colony; considerable quantities of this were found in different places within a mile or two of Lynn, and the first attempt to manufacture iron in New England was made in that town. The great scarcity of iron ware and tools, and of iron for ship building and the erection of mills and dwelling houses; with a lessened intercourse between Great Britain and the Colonies, led Messrs. Thomas Dexter, Robert Bridges, and other enterprising persons, to form a plan for the introduction of the manufacture in the colony. With this view, Mr. Bridges, in 1643, took to London some specimens of ore from the ponds of Saugus. In connection with John Winthrop, Jr., who had preceded him thither two years before, a company was formed, called the "Company of Undertakers for the Iron Works." It consisted of the following gentlemen of wealth and enterprise, viz.: Lionel Copley, Esq., of York, England, Nicholas Bond, Thomas Pury, John Beex, W. Beauchamp, Thomas Foley, William Greenhull, Thomas Weld (minister), John Poocke, William Beck, William Hickocke. The sum of one thousand pounds was advanced for commencing the work, with which Mr. Winthrop, accompanied by a corps of workmen, returned to New England the same year. Preparations were immediately made for the manufacture of iron on a large scale, contemplating not only the smelting, but forging and refining of the metal. The General Court was applied to for encouragement and participation in the business. The design was approved of, but the state of the public treasury did not warrant the Assembly in taking stock in the company. Two or three private persons joined the enterprise, and the General Court granted them, March 7, 1643-4, nearly all their requests, including the exclusive privilege of making iron for twenty-one years, provided they made, after two years, sufficient iron for the country's use. They were allowed the use of any six places not already granted, on condition that they set up within ten years a furnace and forge in each place, "and not a bloomy one." The undertakers and their agents were exempted from all public charges and taxation upon their stock, and themselves and workmen from trainings.

A grant had been previously made in town meeting, 19th of 11th mo., 1643, to Mr. Winthrop and his partners, and to their assigns forever, of about 3,000 acres of the common land at Braintree, "for the encouragement of an iron work to be set up about Monocot river." This grant was not surveyed, however, and was not laid out till January, 1648. It was long a subject of doubt whether the first forge was at Braintree or at Lynn. Lewis, the historian of the latter town, however, asserts positively that the first works were erected at Lynn, on the west bank of the Saugus, upon land purchased of Thomas Hudson, near a chain of small lakes abounding in ore. The village was called Hammersmith, after the native town in England of several of the principal workmen. Large heaps of scorie point out the site of one of the most important, though for various reasons not very successful, undertakings of early colonial times. Operations were continued with variable success for over one hundred years. Mr. Winthrop was ever a benefactor of his adopted country, and several of the workmen whom he introduced in connection with these works were not only of eminent service in laying the foundation of New England enterprise and skill, but left a posterity which has been identified with the manufacturing prosperity of different States to the present day.

In response to several additional propositions from the undertakers, the Court, on 13th November, 1644, granted them three years for perfecting the work and furnishing the country with all sorts of bar iron, provided inhabitants might become proprietors by paying within twelve months £100 each, and an allowance to the adventurers for £1,000 already disbursed, and that they, "with all expedition, prosecute said works to good perfection, as well the finery and forge as the furnace, which is already set up, that so the country may be furnished with all sorts of bar iron for their use at £20 per tun." A grant of three square miles of land was at the same time made them in each of the six places they might occupy, etc. On the 14th May following, the records state that, "whereas it is now found by sufficient proof that the iron worke is very successful (both in the richness of the ore and the goodness of the iron) and like to be of great benefit to the whole country, especially if the inhabitants here should be interested therein in some good proportion (one half at the least)" etc. They were invited to take stock in the business. Twelve to fifteen hundred pounds had then been expended, the furnace built, a good stock of mine, coal, and wood provided, and some tons of sow iron cast, and some preparations had been made for the forge. About £1,500 were required to finish the forge, which was to be paid to Mr. Henry Webb, of Boston, subject to the direction of the undertakers, John Winthrop, Jr., Major Sedgwick, Mr. Henry Webb, and Mr. Joshua Hewes. Colonists were about this time publicly notified that they could join the enterprise if they wished. The partners above named were probably of the number who united with the company in America. Mr. Webb came from Salisbury, England, in 1638, and afterward became a wealthy

merchant of Boston. He was a large proprietor in the iron works, and was distinguished for enterprise and benevolence. In October of the same year, a charter with ample privileges, embodying the previous grants and conditions, was made out and delivered to the undertakers, under the public seal of the colony. It confirmed to the company the monopoly for twenty-one years of the sole privilege of making iron and managing all iron mines they might discover, and granted them all waste lands not appropriated, the use of all wood, timber, etc., to convert into coals and earth stones, clay, etc., for the use of the works, forges, mills, or houses built, or for making or molding any manner of guns, pots, and all other cast iron ware, and for converting wood into charcoal, etc., etc. They were allowed to export any surplus to any part of the world except to enemies.

On the 29th September, two days previous to this grant of privileges, the first purchase of lands, consisting of twenty acres, for a forge at Braintree, was made from George Ruggles by Mr. Thomas Leader, who came from England as general agent of the company. The precise date of the erection of the forge at Braintree we do not find stated, but it followed soon after the other. Mr. Winthrop, on 29th May, also received permission to make a plantation and lay out a site for iron works at Pequod (New London)—to which place he removed in 1646—provided he could find suitable persons to effect it within three years. The works both at Lynn and Braintree belonged to the same company.

Johnson, a contemporary, in allusion to the enterprise, speaks only of the latter place, and quaintly refers to some of the difficulties experienced at the outset. "The land affording very good iron stone, divers persons of good rank and quality in England were stirred up by the providential hand of the Lord to venture their estates upon an iron worke, which they began at Braintree, and profited the owners little, but rather wasted their stock, which caused some of them to sell away the remainder, the chief reason being the high price of labor, which ordinarily was as much more as in England, and in many things treble; the way of going on with such a work here was not suddenly to be discovered, although the steward had a very able eye, yet experience hath outstript learning here, and the most quick-sighted in the theory of things have been forced to pay pretty roundly to Lady Experience for filling their heads with a little of her active after-wit; much hope there is now (1651) that the owners may pick up their crumbs again if they be but made partakers of the gain in putting off England commodities at N. E. price; it will take off one third of the great price they gave for labor, and the price of their iron it is supposed another third is taken off; the abundance of wood had for little will surely take off the residue, besides land at easie rates, and common land free for their use." It was the desire of the rulers, he states, to protect the company from loss at any sacrifice. The court, however, in reply to a letter from the proprietors in 1646, acknowledge the importance of the manufacture to the country, both for domestic supply and for exportation, but as an axe at 12d. was none the cheaper to him who had not 12d. to buy it, "so if your iron," they add, "may not be had here without ready money, what advantage will that be to us if we have no money to purchase it." The scarcity of specie is said to have been a principal difficulty in its management, and caused the business a few years after to pass into other hands. In August, 1648, Gov. Winthrop wrote from Boston to his son at Pequod, in relation to it: "The iron work goeth on with more hope. It yields now about seven tuns per week, but it is most out of that brown earth which lies under the bog mine. They tried another mine, and after 24 hours they had a sum of about 500, which, when they brake, they conceived to be a fifth part silver. There is a grave man of good fashion now come over to see how things stand here. He is one who hath been exercised in iron works." On 30th September he again wrote, "Mr. Endicott hath found a copper mine in his own ground. Mr. Leader hath tried it. The furnace runs 8 tuns per week, and their bar iron is as good as Spanish. The adventurers in England sent over Mr. Dawes to oversee Mr. Leader, etc., but he is far short of Mr. Leader. They could not agree, so he is returned to Tenerife."

The iron works at Lynn involved heavy outlays on the part of the company, the majority of whom were too distant to exercise a proper supervision. They consequently yielded but little profit. They were several times assessed for damages to neighboring property by overflow of the pond, and in 1671 the dam was cut away, after which they were conducted on a smaller scale. In the hands of the old company they were more than once attached for debt, and suits were frequent against the proprietors. In 1677 they became the property of Samuel Appleton, who sold them about ten years after to James Taylor, who, we believe, was the last proprietor. They were not finally abandoned until the lapse of over a century from their commencement.

Spontaneous Combustion in Theaters.

In No. 5, current volume, we published a few facts in regard to the circumstances under which spontaneous combustion may take place. A correspondent of the *Pall Mall Gazette* says:

"I was lately conversing with one of our most eminent scenic painters upon the late catastrophe at Her Majesty's Theater, and he gave his decided opinion that the accident proceeded from spontaneous combustion. He stated that large heaps of the debris and refuse of the painting and property rooms were often swept up together, and left to accumulate for years, and that he had often had reason to complain of this practice, and to point out the danger of it. He related one instance in which such a heap had stood in a theater for a long period, and after many complaints he induced the

authorities to remove it, and the moment a spade was thrust into it it burst into flames. I see that in the *Times* a correspondent puts aside spontaneous combustion because scene painting is done with water color, which is not inflammable; but the danger, though sometimes existing even in the painting room, lies more particularly in the property room, where varnish and oil colors are largely used, and where scraps of oiled rag, tow, varnish, sawdust, and fluff, or fluff, are swept up, together with other matters. This only requires to be damped, as is not an uncommon practice, for the purpose of laying the dust, to induce eventually spontaneous combustion. My informant also pointed to the case of Astley's Theater, which he stated was burnt down somewhat in this way, from the sweeping of the sawdust and stables; and from his experience, which is very great, he felt certain that many other theaters had been so burnt."

Ventilation.

The great importance of ventilation in our sitting and sleeping rooms, in our schools and public halls, is not sufficiently appreciated. It was well set forth in a recent lecture by a Cleveland professor. It is startling to learn the amount of carbonic acid emitted from the lungs of one person, or from a single gas burner; enough to poison the whole atmosphere of a good sized room in a very brief period of time. How many persons think that winter temperature demands the exclusion of fresh air to make their apartments warm and comfortable, when the fact that in the cold season we consume more oxygen, and consequently exhale a greater quantity of the poisonous carbonic acid gas, should lead to a directly opposite course. A bed room in winter requires more ventilation than in summer, and the non-observance of this fact will readily account for the awful diseases to which frail humanity is subject.

We wonder if many of our readers are aware of the poisonous exhalations incident to a congregation of their "fellow citizens," in ball rooms, churches, and lecture halls. If they have not fully considered the vast importance of thorough ventilation, let them take these undeniable facts home to their serious thoughts. A person in health has eighteen breathings per minute, and thirty-five hogsheads of air pass through the lungs in twenty-four hours. Of this, from three to five per cent, or about two and a half hogsheads, is exhaled as carbonic acid gas, and thus one person would render two or three hogsheads of air unfit for breathing again. Let every person anxious for the preservation of his health take care that the windows of the dormitories are dropped a little, even during the winter nights. There is far less danger of taking cold than there is of inhaling the noxious atmosphere, which saps the health, undermines the constitution, and embitters life with suffering and disease that might have been avoided.

—Exchange.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING FEBRUARY 18, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees—

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On filing each application for a Patent (except for a Design).....	\$15
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On application for Reissue.....	\$50
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On filing application for Design (three and a half years).....	\$10
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Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying the mode of making red, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.

74,476—LUBRICATORS FOR AXLES, AND MODE OF ATTACHING THEM TO AXLES.—Levi Adams, Amherst, Mass.

1 claim, 1st. The two jaws, E, E, fitted or secured to the axle, as shown, in combination with the collar, C, at the inner end of the arm, B, and the flange, A, at the inner end of the box, D, all being constructed and arranged substantially in the manner as and for the purpose set forth.

2d. The packing, I, and the cup, F, in combination with the jaws, E, E, the collar, C, on the axle, and the flange, A, on the box, D, all arranged substantially as and for the purpose specified.

3d. The button consisting of metal plate, a, rod, e, pivoted in lug, f, and the nut, g, when used in combination with the jaws, E, E, and all arranged substantially in the manner as and for the purpose set forth.

74,477.—HIGH AND LOW WATER ALARM FOR STEAM GENERATORS.—Thomas P. Akers, New York City.

1 claim, 1st. The employment of two weights, of greater specific gravity than water, inside of a boiler, said weights being arranged so as to be subject to the action of high and low water within the boiler, substantially as described.

2d. A combined high and low water indicator which is controlled by weights of greater specific gravity than water, applied upon the unequal arms of a lever, which is hung within the boiler, in such a manner that, while the weight upon the longer arm shall so far preponderate as to open a valve at certain points of either high or low water, such preponderance will be counteracted by the water when at any intermediate point, substantially as described.

3d. The combination of the steam whistle, F, alarm valve, a, vibrating lever, G, and weights, J, J, of greater specific gravity than water, arranged within a boiler, substantially as and for the purpose described.

4th. The combination of the slide step, b, valve rod, D, with its valve, and the projection, I, of the lever, G, substantially as and for the purpose described.

5th. The combination of the slide step block, b, valve rod, D, and the adjusting device at the top of said rod, substantially as and for the purpose described.

6th. The devices, L, T, R, or their equivalents, constructed substantially as described in combination with the safety valve and the steam whistle, for the purpose set forth.

74,478.—MUZZLE LOADING ORDNANCE.—Frederick W. Alexander, Baltimore, Md. Ant. dated Feb. 6, 1863.

1 claim the apparatus termed a caliber diminisher, for the purpose of diminishing the caliber of smooth bore or rifled guns, after they have been loaded, thus preventing any windage of the ball, and capable of being withdrawn after firing, for a fresh load, and of reinsertion, etc., as heretofore described.

74,479.—SPRING CUP TOY.—Horace B. Ames, Great Barrington, Mass. assignor to John S. Stone, Montserrat, Mass.

1 claim the toy ball and elastic spring cup, formed as specified, as a new article of manufacture.

74,480.—SAFETY VALVE.—Horatio Anderson, Chicago, Ill.

1 claim, 1st. The case, U, H, arranged with holes, o, x, lugs, B, B, dome, L, flange, K, and stop, I, substantially as and for the purpose herein described.

2d. The holes, o, in combination with the plate, M, substantially as and for the purpose set forth.

3d. The combination of lever, t, pivot top, E, F, and stop f, substantially as set forth.

4th. The combination of the nuts, G, J, spindle, P, valve, R, and spring, S, as and for the purpose set forth.

74,481.—TINNERS' DIE.—P. W. Armstrong, Logan, Ohio.
I claim, 1st, Adjustable annular dies, F and G, in combination with the fixed dies, D and E, of a tinner's swaging machine, substantially as and for the purpose herein set forth.

74,482.—TOLKING DEVICE.—In combination with the dies, F and G, and constructed and operating substantially in the manner and for the purpose herein set forth.

74,483.—SEPARATOR SIEVE.—Joseph Barker (assignor to himself and Alonzo Kinyon), Amboy, Ill.
I claim a double sieve for separating seeds, of coarser and finer netting, having the sides of the same so shaped as to incline the sieve to the shoe, in fanning mills, said sides being provided with the strips, a, or their equivalent, substantially as shown and described and for the purposes set forth.

74,484.—PADLOCK.—Ashbel P. Barlow, Claremont, N. H.
I claim the method of applying the springs, d, d', in combination with the shell of drum, f, and key, i, in fig. 2, substantially as herein set forth.

74,485.—CHURN DASHER.—J. W. Barton, Clifton Springs, N. Y.
I claim the arrangement, as a whole, of the jointed cross piece, B, and stand, C, c, open and closed dasher wings, E, G, rods, D, D', and lever, F, the whole being so combined as to form one connected working apparatus, as and for the purpose herein set forth.

74,486.—HEAD BLOCK FOR SAW MILLS.—Herrick Batchelder, Reading, Mass.
I claim securing the inner end of one of the dogs, D, to a movable block E, as and for the purpose set forth.

74,487.—BEEHIVE.—Daniel S. Bear, Toledo, Iowa.
I claim the open bottomed boxes, B, B', constructed as described, having their inner and upper sides formed of slats, c, c', and boxes fitting over the double inclined bottom, A, and adapted to be removed separately, from opposite sides of the hive, as herein described, for the purpose specified.

74,488.—GEARING.—Asa M. Beard, Hillsboro, N. H.
I claim for the purpose specified, in the construction and arrangement of a pair of meshing gears, dividing one gear in a plane square to its axis, and having one part on its shaft, while the other part is attached to said shaft by a spring, which operates to turn said part or its shaft with reference to each other.

74,489.—WOOD SCREW.—Jason A. Bidwell, East Boston, Mass.
I claim a new and improved article of manufacture, a wood screw having its core tapering from its shank to its entering point, and provided with a thread of uniform diameter, as herein described.

74,490.—SCREW DRIVER AND BORING TOOL.—Jason A. Bidwell, East Boston, Mass.
I claim, 1st, The construction of a screw driver which is adapted for driving perforated head screws, with cutting edges formed on a pyramidal point, in combination with scores or grooves, e, for conducting out of the hole the chips or dust, while in the act of boring, substantially as described.

74,491.—WAGON JACK.—Michael Biglin and Daniel W. Bennett, Wilkesbarre, Pa.
We claim the entire form of the "wagon Jack," and more particularly the faced lifting block or follower, marked D, and lever, C, as constructed and operating substantially as described.

74,492.—SEWING MACHINE.—Thomas M. Bradley, Chesnut Level, Pa.
I claim, 1st, The arrangement and combination of the upright lever, D, with its curved arm, C, the plate, H, the needle bar, J, and the wheel, A, as herein described and for the purpose set forth.

74,493.—SKID FOR ELEVATING AND LOWERING BARRELS, ETC.—Clarence Brosius, Hancock, Md.
I claim the skid, slide, and stays, as described and set forth.

74,494.—FOLDING BEDSTEAD.—S. S. Burr, Dedham, Mass.
I claim the combination with the upright case or false cabinet, of a folding bedstead, hinged to the rear of the same, and constructed as herein described, so that when folded up its head board shall constitute the top or cornice of the cabinet, substantially in the manner shown and set forth.

74,495.—CORKSCREW.—John Bussey (assignor to himself and John F. Gunkel), Cincinnati, Ohio.
I claim the arrangement of the lever, K, catch, G, and spiral spring, J, with the handle, B, for the purpose of retaining and releasing the spiral shank, B, of the corkscrew, A, and enabling the said catch to be actuated by the thumb of the hand by which the instrument is worked, substantially as described and represented.

74,496.—COMBINED CORN PLANTER, SOWER, REVOLVING HARROW AND CULTIVATOR.—W. P. Byler, Leavenworth, Kansas.
I claim, 1st, The revolving harrow, B, made adjustable, so as to be contracted and expanded, substantially as herein shown and described and for the purpose set forth.

74,497.—SCROLL SAW.—B. J. Camp, Mar on, Ohio.
I claim the up-and-down adjustable guide bar, G, carrying the bent spring, H, constructed and arranged to operate as herein set forth.

74,498.—CHURN.—Daniel H. Carpenter, Hector, and Hiram B. Slaght, Lodi, N. Y.
We claim, 1st, The stationary frame, A, the swinging frame composed of the parts, C, E, J, and D, arranged substantially as described, for the purpose set forth.

74,499.—CARRIAGE SPRING BRACE.—Joseph H. Chadwick, Wheaton, Ill.
I claim the combination and arrangement of the spring, A, the sill, C, or its equivalent, the braces, c, d, and jointed arm, f, in the manner and for the purposes set forth and shown.

74,500.—PUMP.—Taylor Chamberlin and T. Elwood Garrett, Philadelphia, Pa.
We claim, 1st, The hollow shaft and piston, C, D, arranged and operating substantially as shown and described.

74,501.—SPIKE.—J. Henry Champlin, Essex, Conn.
I claim the spike, A, constructed with slots or notches, a, a', cut into the body of the same at its several angles, substantially as described and as and for the purposes set forth.

74,502.—WASHING MACHINE.—Alvin B. Clark and Charles Davis, Richmond, Ind.
We claim, 1st, In combination with wash board, C, or other suitable surface, the roller, a, rotating and sliding at each alternate stroke, substantially as described and for the purpose set forth.

74,503.—WELL BORING APPARATUS.—N. C. Clark, Low Moor, Iowa.
I claim the combination of the hollow perforated stem, F, and a detachable point, G, with the extensible rod or stem, J, auger, E, valves, H, and shell or casing, I, all constructed and arranged to operate in the manner and for the purpose set forth.

74,504.—SCHOOL DESK AND SEAT.—Milton B. Cochran, Davenport, Iowa.
I claim the continuous desk board, b, provided with the rail, g, and shelves or pockets, f, in combination with chairs, a, and iron braces, e, e', when constructed and arranged for use as herein described and for the purpose set forth.

74,505.—CHURN.—John T. Coe (assignor to himself and Edward F. Coe), Chambersburg, Pa.
I claim, 1st, A churn dasher consisting of two wings set at any desired angle with each other, said wings being made with sides inclined in opposite directions, as and for the purpose set forth.

74,506.—MACHINE FOR CUTTING RAGS.—John Collins, Jr., Detroit, Mich.
I claim, 1st, The spring guard, I, feed roller, H, and cutter, E, combined and operating together substantially as described and for the purpose set forth.

74,507.—COW MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, So operating the "milker" that the same may have a vertical or "sliding" movement, substantially as and for the purpose specified.

74,508.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The pulley, n, and cord, k, in combination with the tube, F, of the milker, and the bent lever, l, substantially as and for the purpose specified.

74,509.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The bent lever, l, in combination with the pulley, n, operating the milker substantially as and for the purpose specified.

74,510.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The gates or stanchions, B, so constructed and operating as to secure the cow while being milked, and to admit of her passage between them when liberated, substantially as set forth.

74,511.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,512.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,513.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,514.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,515.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,516.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,517.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,518.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,519.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,520.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,521.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,522.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,523.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,524.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,525.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,526.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,527.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,528.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,529.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,530.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,531.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,532.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,533.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,534.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,535.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,536.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,537.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,538.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,539.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,540.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,541.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,542.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,543.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,544.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,545.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,546.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,547.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,548.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,549.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,550.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,551.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,552.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,553.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,554.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,555.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,556.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,557.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,558.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,559.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,560.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,561.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,562.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,563.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,564.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,565.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,566.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,567.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,568.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,569.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,570.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,571.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,572.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,573.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,574.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,575.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,576.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,577.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,578.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,579.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,580.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,581.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,582.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,583.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,584.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,585.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,586.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,587.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,588.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,589.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,590.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,591.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,592.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,593.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,594.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,595.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,596.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,597.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,598.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,599.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

74,600.—MILKING MACHINERY.—L. O. Colvin, N. Y. city.
I claim, 1st, The hub, b, of the sliding valve, when constructed as described, so that by a sliding and an oscillating motion can be imparted to the valve, as set forth.

