

rectly under the hooks of the sheath and between them. The plate, C, of the needle is then made to ascend by cam E', pressing on the top of lever F, and when the horn of the needles comes under loop m, on the hook, b, it strips or discharges said loop, and a stitch is thus completed. The loop, n, now lies around the shank of the horn of the needle, in the place formerly occupied by m, and the yarn is laid above by the guide, g, for a new course. The process thus continued for a length of time, makes a web of any desired width, like L, according to the number of needles, sheaths, and sinkers employed. The sinkers, it will be observed by fig. 3, force the yarn against the face of the needle to be caught by its barb, which act accomplished, they are forced back by the cam, D. These operations of the series of tools or devices in this frame are carried on with great rapidity, weaving or knitting like the common cloth power loom, leaving a selv-edge on both sides the knit web.

On starting the machine, it is presumed that there is a course of loops on the horns of the needles. Motion is now given to the shaft of the cam cylinder, B, fig. 1, when the slide, B, fig. 2, is made to advance in the box, G, by rod M, and the yarn guide, g, is made to travel below barb d, behind its horn. The traversing cam, c, on slide B, now pushes forward the sinkers, P; these thrust forward or sink the yarn into loops around the horns of the barks, and when a sinker is thrust on each side of a needle, the latter may be depressed by the cam, E, operating treddle, F, when the needle is forced down, drawing the loop last made through the one of the previous course (m fig. 3.) which is caught on the hook, b, and carried back from the needle horn by the lateral motion of A, as has been described. The formation of each loop is thus a distinct operation, going on as fast as the yarn is laid on by the traveler, g. In the old machines, a whole row of loops are first made, the sinkers then raised, and the cast-off effected. The same principle of operation embraced in this machine may be effected on a circular frame to weave a circular web. This knitting loom is very certain in its action, as each loop is formed and thrust off with such accuracy that no loops are let down, and all knots or unevenness of yarn are carried to the wrong side of the web, thus leaving a beautiful face on the fabric. All the parts are made strong, and can be operated with great rapidity. We have seen the loom represented in operation, and had occasion to admire its simplicity, originality, and the excellent fabric made by it. It will be seen in operation in the Crystal Palace, at the Fair of the American Institute, and more information may be obtained respecting it by letter addressed to Dr. Corwin, at Newark, N. J.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS Issued from the United States Patent Office FOR THE WEEK ENDING SEPT. 25, 1855.

APPARATUS FOR DISCHARGING RESERVOIRS, &c.—Daniel Bedford, of New York City: I lay no claim to a float for either opening or closing a valve, nor do I claim a balance valve when the levers and weights thereof are not so arranged as to hold the valve open when opened by the weight of water, &c., these being old and well-known devices, and form no part of my invention, which is the tumbling lever valve, and combined therewith the float. Therefore I claim the mode of hanging and balancing the valve, c, by means of the lever, e, and its appurtenances, in the manner, and for the purposes set forth. I also claim in combination therewith the float, g, for closing the valve, c, when the whole contents of the receptacle are discharged.

MACHINES FOR SAWING STONE.—C. G. Bietel & H. J. Brunner, of Nazareth, Pa.: We do not claim flexible saws, radial and curved ways, or guiding rollers separately. But we claim the combination of the flexible saws, D, D, rollers, E, E, adjustable radial ways, G, G, and concentric grooves or ways, M, M, whereby the saws are enabled to run at different angles, and their open ends to approach and separate without affecting the degree of their tension, substantially as described.

FIRE ARMS.—Fredk. Beerstecher, of Philadelphia, Pa.: I do not claim the general arrangement whereby two loads may be discharged, in succession, from one barrel without reloading, as such arrangement is not new. But I claim constructing the head of the hammer of fire arms of this description so that the part of the head which discharges the forward load can be capable of being turned down for the purpose of allowing the shorter part of the head to strike the rear tube only, and so that when turned up it shall strike it forward tube only, without the use of the intermediate covering lever, therefore required, for the purpose of preventing the explosion of the rear cap, in fire arms of this description, the same being constructed, arranged, and operating substantially as described and set forth.

PRESSURE STOPPERS FOR CHAIN CABLES.—James Emerson, of Worcester, Mass.: I claim the arrangement of the jaw hinged at its one end, and having a pawl at or near the other, with the bed plate for operation together, and the whole being constructed substantially as specified.

[This improvement consists in a means of preventing the injurious effects resulting from the sudden jerking of the anchor chain, when a vessel is riding at her moorings. In rough weather and a heavy sea, the windlass is liable to be injured, and the chain to be snapped, from the cause above-mentioned. Mr. Emerson makes use of a stopper, one portion thereof consisting of a sliding weight under which the chain passes. The weight is pressed down upon the chain by means of a lever, so that the degree of pressure may be very easily regulated. When the force of the jerk exceeds the pressure of the stopper, the chain will slip a little, and so afford the required relief. This is a very cheap, simple, and effective invention. Our nautical friends, we feel confident, will be much pleased with its operation. T. B. Mackay, Esq., of Boston, Mass., is one of the owners of this patent.]

RAKES FOR REAPING MACHINES.—Thos. N. Lupton, of Winchester, Va.: Being well aware that cranks, pitman rods, and gear devices have been employed as elements, in part, of the mechanical construction of grain harvesting machines, I do not claim such devices separately. But I claim the construction of an automatic rake, having a revolving tubular or sleeve socket, L, with a revolving extension or reciprocating piston rod, m, a slide socket, q, with a sliding arm, r, and a geared rake device, w, in combination with the collar, f, the whole being constructed and operated substantially as described.

WRENCH.—Henry J. Behrens, of New York City: I claim the employment of an eccentric, toothed on its periphery, and held down by a spring, as described, in combination with the smooth bar wrench, in the manner and for the purpose herein set forth.

ACTUATING GAS ENGINES.—Wm. Mt. Storm, of New York City: I claim operating an engine by the agency of water charged with a gas permanently uniform at ordinary atmospheric temperatures and pressures, and over which water has a gas acting power of absorption when the process consists in passing a given quantity of the gas set free in charges, under pressure, by heat, through the engine, actuating its piston, and thence to a closed, cool and wet vessel, while contemporaneously therewith, I cause to pass to said vessel a sufficient quantity of the same water which had just previously held the gas absorbed to re-absorb it—both water and gas being cooled, mean-while, by means specially provided, to an extent sufficient to cause their re-combination in the original form of gas-charged water—ly all of which means the motive power of the gas is obtained, without the necessity of converting the water into steam; while, at the same time, the gas is thereby re-concentrated and preserved for re-use, without entailing an accumulation of water in the heating or separating vessel, or an accumulating pressure of free gas in the cold receiver, all as set forth.

SHIP'S RUDDERS.—J. S. Robbins, of San Francisco, Cal. I claim arranging the two rudders, and combining them by means of the arms, b, b, and b', and connecting rods, c, c, substantially as, and for the purpose herein set forth.

[In this improvement two rudders are employed to steer the vessel. One of them is attached to the sternpost in the usual manner, the other placed directly behind the first, and secured in an iron frame which projects back for that purpose. The two are connected together with arms in such a manner that the force of the water, when it comes in contact with the after rudder, will assist the helmsman in moving the post rudder, so that they counter-balance each other. This, it is said, reduces the labor of steering to almost nothing, gives complete steadiness to the wheel, and enables a single man, or even a boy, to guide the largest vessel in the fiercest storm, with perfect ease. The inventor is confident that in this improvement the objections which have hitherto attended the use of double rudders are entirely overcome, while the important advantages above named are secured, together with many others not here enumerated. We commend this patent to the attention of all who are interested in marine affairs.]

OPTICAL INSTRUMENTS.—Robt. B. Tolles, of Canastota, N. Y.: I claim constructing the eye-piece as described, in such a manner, that when placed at a proper distance within the focus of an object glass, its anterior refraction shall be properly that of a concave lens, substantially as set forth.

HOLD-BACK FOR CARRIAGES.—Alonzo Webster, of Montpelier, Vt.: I claim the dovetail groove, D, the dovetail slide, E, and the spring, V, the whole being applied and operated substantially in the manner and for the purpose specified.

LEATHER FINISHING MACHINES.—Chas. T. F., and J. W. Weston, of Salem, Mass.: We claim, in a machine for finishing leather, in combination with the soft elastic bed, and elastic finishing tool, the cord, p, secured to the tool stock, for the purpose of keeping the tool clear of the leather, during its retrograde movement over the bed, as set forth.

BORING MACHINE.—A. Wyckoff and E. R. Morrison, of Elmira, N. Y.: We claim, first, the employment or use of the tubular or hollow auger, constructed as shown, for the purpose specified. Seco, d, we also claim the combination of the tubular or hollow auger, D, and worm or screw, J, arranged substantially as shown and for the purpose specified.

[Messrs. Wyckoff & Morrison have produced a very novel improvement. It consists of an auger, made, externally, in the form of a tube. The cutters are placed just within the periphery of the tube, at its lower end, so that when the latter is revolved a hole is bored and the auger enters the stuff, while the chips rise through its hollow interior. The outside of the tube is furnished with a spiral ledge or screw, which assists the rise and discharge of the chips. It is said that nothing can exceed the facility and accuracy with which pump logs are bored, and other species of work accomplished by the use of this improvement. Every mechanic will be struck with its simplicity and cheapness.]

COFFEE POTS.—Joshua F. Hall, of Cleveland, O.: I claim the conical tube, B, with the knob, P, and aperture, H, which serve as its continuation. This I claim, in combination with the reservoir, D, D, as set forth.

MAKING PRINTERS' TYPES.—S. S. Weed, of Stoneham, Mass.: I claim, for making type, the described combination and arrangement of the stationary body or bed die, l, a bounding die, M, and receiving orifice, N. I also claim the combination of the feeding lever, R, the nipper, S, and the rod, T, provided with shoulders, U, as set forth, the whole being for the purpose of feeding the type rod into the mechanism, or its dies, as specified.

TRIP HAMMERS.—P. L. Weimer, of Reading, Pa.: I claim the arrangement of the hub, or center piece, B, the pawls, F, the interior ratchet ring, D, the lined metallic strip, S, the hand wheel, E, and the post, P, the whole being combined, arranged, and operated in the manner, substantially as specified.

[This invention consists in the peculiar mode of operating the cut-off valve, whereby the steam may be let into the cylinder and cut off at varying points for the purpose of regulating the force of the blow of the hammer. We should need diagrams to illustrate its operation. The movements of the hammer may be instantaneously controlled, at the will of the operator. We regard it as one of the best improvements of its class.]

BESTREDS.—Wm. White, of Portsmouth, Va.: I claim the jointed parallelogram of bars, provided with rods, or their equivalents, which extend to the lead at several points, and are secured thereto and tightened, substantially in the manner and for the purposes set forth.

FLOURING MILLS.—D. S. Wagener, of Penn Yan, N. Y.: I claim the arrangement of tubes, B and C, connected by the supplement I shoe, K, within the air-tight chamber, A, in the manner described and for the purpose specified.

ARTIFICIAL LEGS.—John Taggart, of Roxbury, Mass., assignor to himself and T. D. Parker, of Boston, Mass.: I claim making the leg and foot without any ankle joint, as specified.

I also claim combining together and with the foot, the part A, and the thigh case, B, the two springs, C and L, so as to operate therewith, substantially and for the purpose as specified.

SHIPS' WINDLASSES.—J. B. Holmes, assignor to J. R. Pratt and J. B. Holmes, of New York City: I make no claim to the application of wheels, or gearing of any description, to ships' windlasses, for the purpose of occasionally increasing the power, as such has been done before, and in particular, has been described by Hendmarsh and others. Nor do I make any claim to the stationary or revolving shaft or spindle or spindles, of the chain barrels, A, A'. Nor do I claim any of the parts constituting my windlass, when detached or separated.

But I claim the arrangement of the shaft, E, with its gearing wheels, F and G, and the clutch coupling, H, in relation to the drums of the windlass, and their gearing, as set forth, whereby the one or both drums may be moved with a quick or slow motion, or the one drum may be moved with the quick and the other with the slow motion, at the same time.

[We have in preparation some engravings illustrative of the above invention; they will be published as soon as the foreign patents, which are now being solicited through the Scientific American Patent Agency, are granted.]

REGULATING LENGTH OF STROKE IN MORTISING MACHINES.—Ezra Gould, of Newark, N. J.: I claim attaching the connecting rod, O, to a curved slotted arm, E, by means of the plate, c, and the pin, d, the plate, c, working in a slot, c, in the pulley, A, and the arm, E, operated by means of the gearing, I, n, p, a, and q, k, arranged as shown, or in an equivalent way, for the purpose specified.

[The above is a power mortising machine, and the improvement consists in a peculiar arrangement of parts, whereby the depth to which the chisel enters the stuff is made variable. At the first stroke the chisel enters but a short distance; at the next stroke it sinks deeper, and so on; the variation in the depth being accomplished without stoppage of the machine. Drawings would be required in order to describe the parts clearly. It is sufficient to say that the features above mentioned, to which are combined other new and convenient arrangements, render Mr. Gould's improvement, apparently, one of great value. The rapidity of its performance, and the excellence of the work it produces, will render it a very general favorite.]

CORRUGATED BEAMS.—Richard Montgomery, of New York City: I claim a supporting beam, formed of sheet metal of unequal thickness, bent into a series of folds substantially as represented and set forth.

AWNING FOR HORSE AND DRAY.—Jacob Nelson, of Cincinnati, O.: I claim the portable and reversible dray and horse canopy, whose poles, f, are hinged at one end to posts, b, and supported in either the forward or backward position by braces or brackets, g, h, projecting from the posts.

[This is a good improvement. In all our cities it is customary to expose dray horses to the burning rays of the sun in summer, although, owing to the slow rate at which they travel, they might be protected by some such simple device as the above.]

MACHINE FOR CUTTING ORNAMENTAL MOLDINGS.—H. & Richard S. Schevenell, of Athens, Ga.: We do not claim the reciprocating gate or slide, F, with cutters attached, for they have been previously used. But we claim the combination of the reciprocating gate, or slide, F, rotary lappers, L, L, and the inclined planes or wedges, M, M, the above parts being arranged substantially as shown, for the purpose specified.

[The above invention relates to improvements in machinery for the production of the various kinds of irregular figured ornamental moldings, that are now so extensively used in the finishing-up of railroad cars, furniture, apartments, cabinet work, &c. The nature of the invention consists in combining a rotary pattern with the ordinary up-and-down cutter gate. One of Mr. Schevenell's machines, we are told, will last longer, do more work and of a better quality, than any machine of the kind now known. We regard it as an excellent improvement.]

RE-ISSUE.
PUMPS.—L. P. and Wm. F. Dodge, of Newbury, N. Y. Patented June 7, 1853. We claim the combination of the cylinder or chamber, A, and the piston, constructed as described, with its valves, and the induction and eduction passages, so that the water all entering said cylinder, under pressure, alternately at its ends, is discharged under pressure, through the opening at its side, producing a constant and direct stream through the piston heads from the cylinder, substantially in the manner and for the purpose set forth, thus dispensing with chambers and partitions in the barrel and valves, at the eduction port, preventing leakage, and rendering the pump, more simple and effective, and less liable to derangement.

Very Important Patent Case.

SICKLES' CUT OFF.—A very important decision has just been rendered by Judge Nelson, in the U. S. Circuit Court, this city, on a motion made for a preliminary injunction by W. B. Sickles and others, to restrain D. L. Young, S. Cutter, J. Barstow, and George H. Corliss from infringing the patent of F. E. Sickles, granted in May, 1842, for a method of operating the valves of steam engines by adjustable cams or trippers, and the preventing of the valves from slamming in their seats, by a dash pot containing fluid. The defence set up was non-infringement. The defendants were using the engine of Corliss and Nightingale, of Providence, R. I., for which G. H. Corliss had obtained two patents (in 1849 and 1851) embracing an entirely different mode of operating the valves, and also preventing their slamming, by the use of a cylinder as a cushion. A motion was made for the same kind of injunction in the early part of last year, but the Court then ordered the points asserted to be infringed by complainant, and not to be infringed by the defendants, to be tried at common law by a jury.

This was done in December, 1854, before Judge Betts, this city, when the jury decided that the defendants did infringe the plaintiff's patent, as published on pages 157 and 158, vol. 10, Sci. Am. The decision now rendered by Judge Nelson is just the same as might have been made on the first motion for a preliminary injunction, as it is given simply on a renewal of that motion, and it denies and sets aside the verdict of the jury. It amounts to this, that the patents of Corliss are essentially different from Sickles', and that his engines do not infringe the "Sickles Patent." We are of the opinion that the decision is a correct one, but the Judge ought to have rendered it on the first application, and thus saved the expense of the jury trial, which occupied three weeks. It appears to us that both Court and counsel have done complainants and defendants wrong, by thus leading them into such enormous expenses.

Resistances on Wide and Narrow Curves of Railroads.

The *Tribune* of the 23d ult. contained an article on some experiments lately instituted to test the power of locomotives on the New York and Erie Railroad, says:

"The width between the rails on this road is six feet, that of a great majority of the roads being only 4 feet 8 1-2 inches; and many contend that the resistance to motion on curves is increased with each increase of width, an opinion which, although apparently well founded in theory, this experiment has done little to establish. Although frequent experiments of this kind have been tried at various times on long lines of narrow roads, this is the first to our knowledge of a 6 feet gauge."

Experiments of this kind can just as well be tested on a short as on a long line, if the conditions are the same. Clark says, on page 301: "A curved line has been estimated to have added 10 to 12 per cent. to the resistance in the case of the Bunscombe Incline on the broad gauge, (7 feet), the curvature being undetermined. On the narrow gauge, (Caledonian, 4 feet 8 1-2 inches,) it was estimated that curved line, having one curve under 1 mile radius for every 2 1-2 miles, incurred an excess of resistance equal to 20 per cent. of that due to a line practically straight."

The length of axle on a wide gauge is a great disadvantage on sharp curves, in comparison with the shorter axle on narrow cars; this is the only increase of resistance that can be experienced. But the *Tribune* is right with regard to experimental data, in reference to what that amount comparatively is, on narrow and broad gauges of the same curve. Loose wheels have been proposed and tried, to reduce the resistance on curves, but hitherto, so far as we have been able to learn, without success.

Railroad Verdict.

An accident took place last week at West Albany, (near old Albany,) on the New York Central Railroad, by which the engineer, John Pratt, and the fireman, F. E. Kirkland, were killed. When a freight train was crossing the switch at the above-named place it parted its connections, and five cars were left on the track, and at this time up came the passenger train at the rate of thirty miles an hour and run into the five freight cars on the track. The verdict of the jury called at Albany on the 21st ult. is, "that the accident was caused by the engineer violating the rules of the Superintendent by running about twenty-four miles faster than his instructions allowed, which are that at that place the speed of the trains should not be above six miles per hour."

Improvements in Railroads.—Atmospheric Resistance.

The editor of the *Glasgow Practical Mechanic's Journal*, in the number for this month, reviews the work of D. K. Clark, on Railway Engineering, says that his deductions on the resistance of engines and trains "appear to be thoroughly and well worked out, and tabulated with the skill of a master." This is the author we quoted as sustaining our views respecting other resistances than that of the atmosphere increasing according to the square with the velocity. Our views are sustained by the best and most scientific judges of the question. Our railroad companies should not forget that this practical and scientific author has said, "The great element for improvement is the permanent way."

Hydro-Sulphuric Acid.—Erratum.

In the last number Sci. Am., page 8, column 4, for the word "hydro-sulphuric acid" read "dilute sulphuric acid." Philologically the word is correct. Its simple meaning is "water and sulphuric acid," but in chemistry hydro-sulphuric acid is understood to mean sulphuretted hydrogen—hydrothionic acid, S H.