

MECHANICAL INVENTIONS.

Mr. Karl Müller, of Fordham, N. Y., has patented an improvement in turning implements for use with lathes in turning articles with straight or tapered surfaces, and consists in certain novel features of construction, whereby the tool is especially adapted for small work, and for obtaining uniformity to a given pattern when the articles are produced in large quantities.

Messrs. Samuel Rather and Daniel Rather, Jr., of Holly Springs, Miss., have patented an improvement in smoke and cinder conductors for railroad trains. This is an improved device for attachment to the cars of railroad trains to receive the smoke and cinders from the locomotive and conduct them to the rear of the trains, to prevent the passengers being annoyed by the entrance of the smoke and cinders into the cars.

Mr. Charles H. Brazeal, of Tye River Depot, Va., has patented an improvement in smut machines which is intended to remove the closely adhering smut as well as that which lies loose among the kernels.

An improved safety hook has been patented by Mr. Henry Blakeman, of Jefferson City, Montana Territory. The object of this invention is to prevent the bucket or other object suspended from the hook from slipping therefrom. It consists in providing the hook with a keeper sliding on the shank to and from the point thereof, and a spring for locking it in place against the end of the hook.

Messrs. Vestus P. Willcox and Orrin Ranney, of Corry, Pa., have patented an improved machine for boring brush blocks and other work in wood or metal requiring straight and inclined holes to be bored close together or in groups.

An improved hay and cotton press, patented by Mr. Jacob Huffaker, of Gap Creek, Tenn., consists of an upright standard rigidly fixed in a suitable base frame, and carrying the follower secured upon its top, while inclosing the follower is a movable press box, that is elevated by shores whose lower ends are provided with rollers, and drawn down or depressed by ropes and rollers and winches; and it further consists in so connecting the rollers and winches and compounding their forces that the operative power may be most advantageously applied.

Mr. Joshua Henshaw, of St. Hyacinthe, Quebec, Canada, has invented an improved machine for extracting stumps and raising stumps, stones, and other heavy objects. The invention consists in the combination of a slotted ratcheted bar arranged to slide on a bar which supports a lever carrying two pawls, which work in the ratcheted bar. Two fixed pawls are provided for retaining the ratcheted bar.

Mr. Royal R. Piper, of East Saginaw, Mich., has patented an improvement in that class of pipe wrenches in which a chain is employed in connection with a serrated jaw and a handle or lever.

Mr. Francis H. Young, of Stanhope, N. J., has patented an improved station indicator for railroads. This invention, although quite simple, cannot be described without engravings.

An improved lifting-jack, patented by Messrs. Joseph S. Blackburn and Samuel G. Brosius, of Beloit, O., consists of a lifting bar having on its lower end a socket piece, which is passed over the standard, while at the upper end of the standard is a pivoted strap, through which the bar is passed.

Mr. Andrew Dilts, of Dallas, Iowa, has patented an improved spoke setting machine. It consists of a frame for holding the hub firmly on a pivot, so that it can be turned freely, and an adjustable gauge for holding the spoke while being driven.

Mr. Joshua W. Jones, of Harrisburg, Pa., has patented an improved evening-up table provided with a device for smashing the head and back folds of the sheets to take out the swell, so that the sheets may lie more solid and compact, thus greatly facilitating the handling of the work in book binding.

Mr. John D. Graves, of Wichita, Kan., has invented an improved windmill, in which the wheel is held to the wind by a vane, and turned more or less at an angle to the direction of the wind by horizontal adjustment of the vane, which adjustment is automatically performed for regulating the speed and power of the wheel by the endwise movement of the wheel shaft acting upon an elbow lever connected to another elbow lever, which in turn is connected to the vane; or it may be done by hand by a rope attached to the first named elbow lever and passed over a pulley.

Mr. Isham M. Rosier, of Jonesville, Va., has patented an improved reciprocating sawmill, which is so constructed as to saw the logs from end to end, reverse the motion of the carriage automatically at the proper time, and saw the log in both directions, thus saving lumber, time, and labor.

SHEARING AND RIVETING MACHINERY.

The engravings on this page represent two machines made by Messrs. Sellers & Co., of Philadelphia, Pa.

A heavy plate shearing machine for trimming the edges of long plates, or for cutting plates of 5 feet in width or under to length, is shown in Fig. 1. This machine was designed to meet the requirements of modern ship building or bridge construction. It is provided with a bed for holding the plate, and clamping it if necessary, and will shear plates 1 inch thick with exceeding exactness. The upper blade is guided vertically, and is driven downward by a pitman as wide as the blade is long, receiving its motion from a long

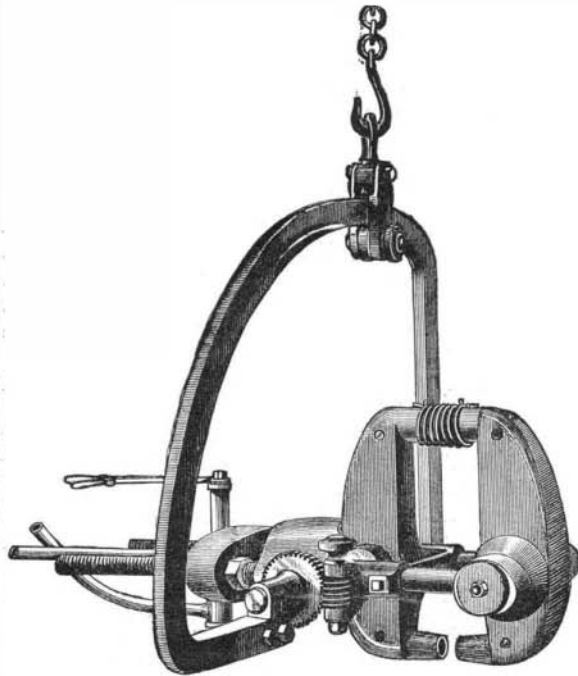


FIG. 1.—PORTABLE RIVETING MACHINE.

rocking shaft above it, which is operated by an arm or lever in the rear of the machine and not seen in the engraving. This arm has a segmental rack working into the teeth of a spiral pinion driven by a bevel wheel and pinion, and open and crossed belt similar to the method adopted by this firm for their planing machines. The driving arrangement is exceedingly efficient, and an automatic adjustment is provided to the belt-shift motion gauging the length of stroke. The blade after making the down stroke immediately ascends again at double its descending speed, and stops up ready for the next cut. It is at all times under the control of the operator, and can be made to cut to any fixed point in its length, and then stopped or raised, the hand rod in front, operated from either side, being used for shifting the belts and starting or stopping. Curved blades can be placed in the vertical slide if desired, and the bed plate connected with the

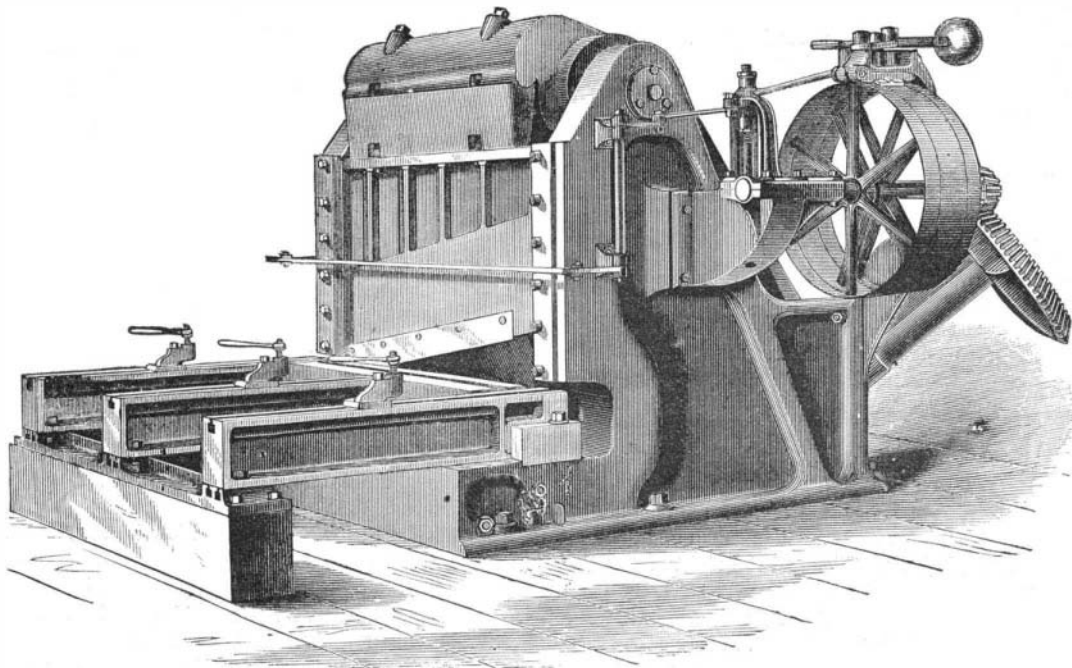


FIG. 1.—PLATE SHEARING MACHINE.

lower blade may readily be removed to receive a curved bed plate, with shear plate bent to correspond with the curve of the upper blade.

The subject of riveting by power has for some time attracted the attention of mechanical engineers, and steam riveting machines have been used with considerable success. There are objections, however, to the use of steam which have been most effectually met by the application of hydraulic power.

Fig. 2 shows a portable riveting machine possessing many new features, and arranged with convenient overhead carriage and hoisting machinery to facilitate its use. The essential point of this invention consists in the use of an accumulator, from which a continuous regular pressure may be ob-

tained as wanted. The adjustable accumulator is arranged with weights suspended below the main casting, and easily released, if required, to adjust the pressure to the kind of work being done, each weight representing 250 pounds per square inch on the ram of the riveting machine, and the maximum pressure obtainable being 2,000 pounds per square inch. A double acting pump is connected with it, operated by crank motion, and taking its water from a reservoir in the upright column to which it is attached. The pump is arranged so that when once started for work it is never stopped while the machine is in use. By an improved relief valve, as soon as the accumulator is full, the direction of the water coming into it from the pump is changed back into the same reservoir from which it was taken, and it continues so to flow until wanted in the accumulator, when the action of the valve directs it back again. The pump is maintained in motion ready for immediate action, and yet relieved from strain when not required for work, avoiding all risk of delay at starting or of loss of water and entrance of air in the chamber while standing.

The portable riveter is suspended from a hoisting machine and overhead carriage, having both longitudinal and transverse motion. The water under pressure is carried by jointed or flexible pipes from the accumulator to the machine, and passes into a compressing cylinder in which a piston works.

The Hotchkiss Magazine Gun.

The Hotchkiss magazine gun, which is now made in part at the armory, is a modification of the French chassepot. The magazine, which is in the butt, contains six cartridges, which are forced forward by a string. The barrels, ramrods, bands, stocks, and some other parts are made here. The patented parts are made by the Winchester Repeating Arms Company, of New Haven, who have expended about \$30,000 in preparations for their manufacture. The machinery at the armory is not adapted to the manufacture of these parts; and, as the appropriation of Congress is only \$20,000, and the whole thing is an experiment, the plan of obtaining the small parts from the Winchester company serves the interests of economy, and will result in the production of eleven hundred guns, while otherwise only five or six hundred could be made. When completed these guns will be distributed to the army for practical tests.—*Springfield Union.*

Photography of Flashing Signals.

Army telegraphing by means of flashing signals has been successfully done, between stations fifty miles apart, by the British in Africa. The London *Photographic News* suggests that a camera be employed to photograph the signals by the heliograph, as it would be possible to signal much faster, for the receiver, instead of requiring time to puzzle over the message as it was transmitted, need pay no attention until the complete sentence was before him. No doubt there would be certain practical difficulties to be overcome in adapting the camera to the heliograph, but applications of a like nature are practiced every day by scientific men. The Mance heliograph, first submitted to the British Government by Mr. Mance in 1869, as now used, is a very simple contrivance, and as photographers are interested in all that pertains to light, they might like to know how the apparatus is worked. It consists simply of a tripod, upon which stands a mirror. This mirror is usually ten or twelve inches in diameter, and a glass of this size is capable of reflecting a ray visible to the naked eye at a distance of fifty miles, and even more in clear weather. The mirror is movable, swinging like an ordinary toilet looking-glass, but it has, moreover, a pivot at top and bottom that permits it also to be turned sideways. In this way it is possible, whenever the sun shines, to reflect a ray in any direction, unless it should happen that the sun is too far behind, when the difficulty is at once obviated by bringing into play a second mirror, which reflects the

rays on to the first. But if the distance to be signaled is fifty miles off, it is necessary that the signaler should aim perfectly straight, and to do this he handles his mirror after the manner of a rifle. He gets behind it, and looks through a hole in the center (where the quicksilver has been removed), and having sighted the station afar off, he brings up in a line with his eye and the station a small stud that slides on a sighting rod, some ten yards in front of the mirror. When this stud covers the distant station, the aim of the mirror is correct, and all the signaler has to do is to see that the reflection of his mirror shines upon the stud. So long as this is the case he may be sure his brother afar off will see the reflection too. A key to be pressed by the hand is in connection with the mirror, and throws the reflection on