operated by the two cams *B B*, one for each direction of movement, and each has its working face of a variable contour the same as the turret cam.

The turret is operated from the levers *H* and *F* in a novel manner. A rack of circular section *G* is moved across the turret slide. The connection between this rack and the levers being one of contact only, the levers are free to slide over it as required by their longitudinal travel and are provided with broad faces for this purpose. The movement of the rack is transmitted to a pinion under the turret slide, which in turn transmits it to a longitudinal rack attached to the turret slide, thus changing the direction of movement through 90 degrees.

The camming of the machine for any piece of work is the adjustment of the cams on the cam-wheel *D*, of which there are two sets, and those on the cam wheel *A*. One set on *D* is adjustable longitudinally for the levers operating the turret slide and the other circumferentially along the edge of the rim for the fast and slow speed of the cam shaft. The cams on *A* are for feeding the stock and for reversing the direction of spindle rotation. The cams for feeding require no adjustment, the adjustment for feeding the stock being effected by the screw *L* which limits the throw of the feed lever. If the screw allows the full retraction of the lever the stock is fed the full limit of the feed mechanism. If the screw is adjusted to the other limit, there is no feed at all. The adjustment for feed may be made while the machine is running. The cams for reversing the spindle are circumferentially adjustable along the inner edge of the rim of the cam-wheel. It is apparent from the foregoing that the setting up of this machine is the adjustment of permanent parts and that there is no drilling and tapping of holes or the shaping of cams to any particular contour. This is a feature of prime importance in the economical operation of screw machines and marks a decided step in advance in their development.

* * *

METHOD OF MACHINING LATHE BEDS.

The Automatic Machine Co., Greenfield, Mass., manufacturers of automatic screw machines, speed lathes and cutter and reamer grinders have recently built and installed in their factory a combined milling and boring mill which possesses a number of features of interest. The machine was designed with special reference to the work done in the shops of this company, and the illustrations show it set up for operating upon speed lathe castings.

These lathes are made with the headstock and bed in one casting and the milling and boring machine is adapted for machining these at low cost, and also so accurately that the castings will be interchangeable and the lathe spindles will align with the ways without an excessive amount of scraping. The lathe beds are first placed upon a jig, as represented in Fig. 1, it having a capacity for three 11 inches by 5 feet beds at the same time. Three beds are milled on the bottom and on one side, all at one cut. They are next placed upon another jig, as shown in Fig. 2. The ways are milled as shown in the illustration. The mills are raised and the lathe heads are milled for the caps. They are drilled and tapped by a radial drill not shown in the engraving. The boring jig is next placed in position, and the heads are bored for the boxes. In this manner each lathe must be exactly like every other lathe, and consequently all parts will interchange.

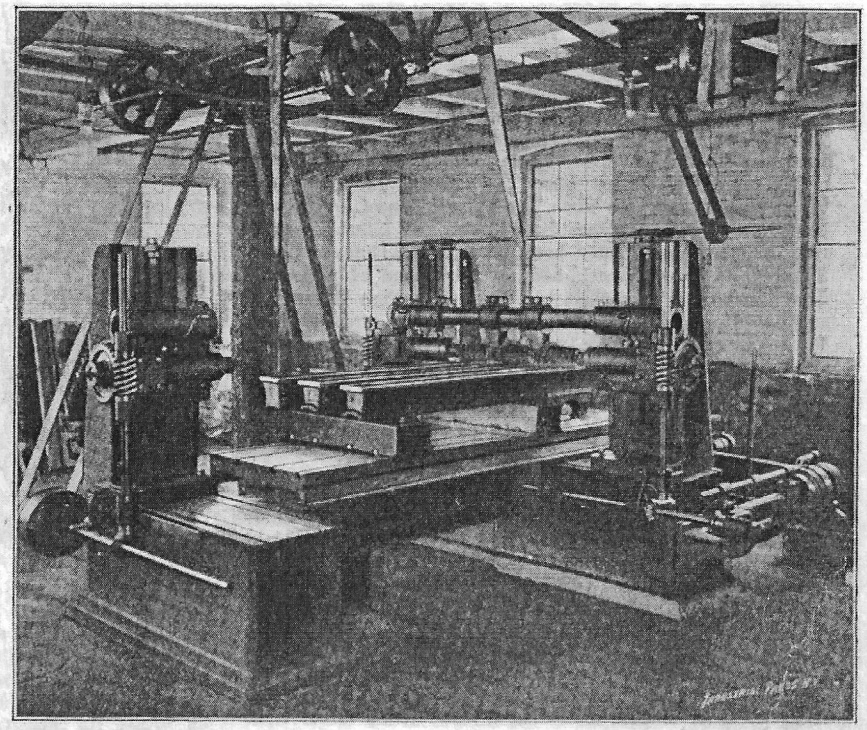


Fig. 1. Milling and Boring Machine arranged for Milling Lathe Beds.

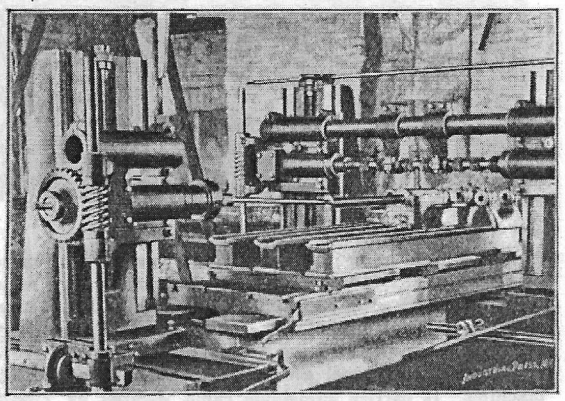


Fig. 2. Boring the Lathe Headstocks.

This method of doing the work is found to be a great step in advance of those formerly used. It enables the manufacturers to turn out the work in large lots at low cost, and the product is found to be as nearly perfect as could be desired.

* * *

A London electrical firm, Sherard Cowper-Cowles & Co., have made some experiments in sharpening worn-out files by dissolving electrolytically a thin film of the surface metal thus leaving the angles sharp as when new. This process has not proven very successful in the past, but this firm announce that they secured quite satisfactory results with an electrolyte of ferric chloride and a high-tension electric current.

* * *

One of the curiosities of the hardware trade is a magazine tack hammer. The magazine is located underneath the handle and holds 60 or 70 6-ounce or 8-ounce tacks. Each tack is fed to the magnetized face of the hammer by pressing a trigger which releases one tack and locates it in the proper position on the hammer face. The novelty of the device is said to be only surpassed by its convenience.

NEW TOOLS OF THE MONTH.

Under this heading are listed new machine and small tools when they are brought out. No tools or appliances are described unless they are strictly new and no descriptions are inserted for advertising considerations. Manufacturers will find it to their advantage to notify us when they bring out new products, so that they may be represented in this department.

In addition to the tools listed under this heading an automatic screw machine has recently been brought out by Sittman & Pitt, Brooklyn, N. Y., and is illustrated in another part of this paper.

In the January, 1900, number of MACHINERY, the Simplex Center Grinder, made by Herman Dock, Philadelphia, Pa., was illustrated and described. It consisted of a very compact attachment for clamping in place of the tool holder, which carried an emery wheel for grinding the center and the proper gearing for same, the driving wheel of the gear being driven from the face plate direct. An improvement of this grinder has recently been brought out, known as the Simplex Universal, which has the advantage of a positive drive, and in which centers of other angles than 60° may be ground. It is adjustable so as to grind centers of angles from 55° to 90°, and the first part of the drive is a gear and pinion, the latter with teeth at an angle of 16°, which replaces the former round belt. An adjustable equalizing driving rod is now used to engage in the face plate in opposite points, so as to absolutely balance the pull of the lathe and prevent variations in the speed of the emery wheel.

The Hoggson & Pettis Mfg. Co., New Haven, Conn., have brought out a self-opening and adjustable screw cutting die head. The die is composed of four chasers, arranged to be adjustable to different diameters and to open free from the work after any desired length of thread has been cut. The dies, or chasers, are inclosed in rectangular slots formed by the head and the cap, and are backed by the outer shell, making them very rigid. The shell which backs the dies has a cam cut in it at the back of each die, so that by loosening two nuts at the back of the head, the dies may be adjusted very closely or slacked off to cut threads fitting either tight or loose, or to compensate for any slight wear. When this head is used on an automatic turret machine, the feed is arranged to be thrown out when the desired length of thread is cut, at which the pressure of the stock on the dies draws the head forward, causing the dies to open by springing back into beveled recesses in the shell and thus immediately clear the work. The dies are interchangeable, so that dies of any thread number, either standard or special, may be substituted. The use of chasers allows chips and dirt to easily clear the work and, as the head is hollow throughout, oil may be forced through to keep the dies clear.

AUTOMATIC SCREW MACHINE WITH NEW FEATURES.

The annexed cuts, Figs. 1 and 2, show front and back views of a new automatic screw machine recently placed on the market by the Automatic Machine Company, Greenfield, Mass. The machine contains a number of interesting features which are believed to make it a decided step in advance in the evolution of the automatic machine. One belt suffices for driving both forward and backing spindle pulleys and also operating the feed mechanism. The belt arrangement favors grouping a lot of machines closely together as they may readily set at an angular position and thus overlap so as to get a greater number in the length of a room.

By making the feed drive dependent on the main belt there is no danger of wrecking the machine by the breaking of a driving belt and the consequent running away of the feed motion as sometimes occurs with independent feed motion. The manner in which one belt is made to fulfil its triple function is plainly shown in the engravings. The belt is wrapped around a pulley set at an angle which thus acts as an idler to reverse the belt for the forward and backing pulleys and also transmits motion to the feed mechanism. In Fig. 2 the shaft on which the idler pulley is mounted is shown carrying two bevel gears, the upper one of which meshes with a gear case and the lower with another bevel gear mounted on a universally-jointed shaft carrying a slitting saw. The gear case contains an epicyclic gear train which is arranged to accelerate the motion of the various tools when bringing them into position.

The principal feature of the new machine and the one which will be most appreciated by those having experience with the older types, is the ease with which it is "cammed" for various classes of work. Instead of using the flat-faced drums requiring the use of strap cams bolted to their faces,

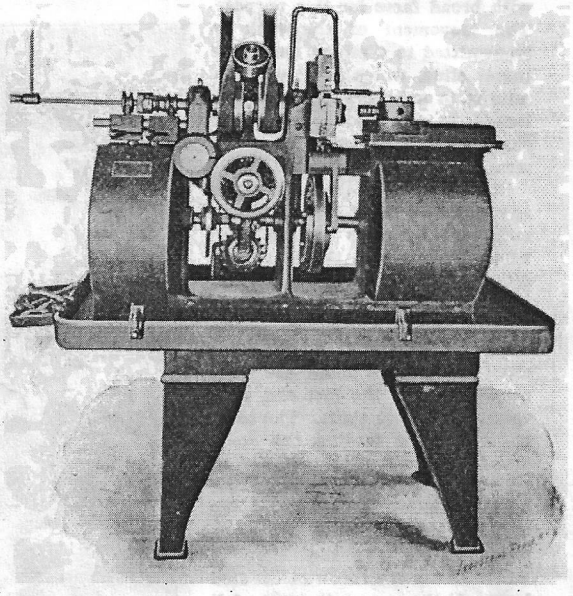


Fig. 1. Front View of Automatic Screw Machine.

the method has been adopted by which the cams are held to the cam-wheel by T-bolts engaged in continuous T-slots around the periphery of the wheel. With a variety of cams of various angles provided, the camming of the machine for any job within its capacity is a job of minutes compared with one of hours where the straps have to be laid out and holes drilled and tapped by the old method.

There are three cross slides, two horizontal and one vertical. The slides are attached to the headstock which makes them more rigid in resisting the cut and also saves space

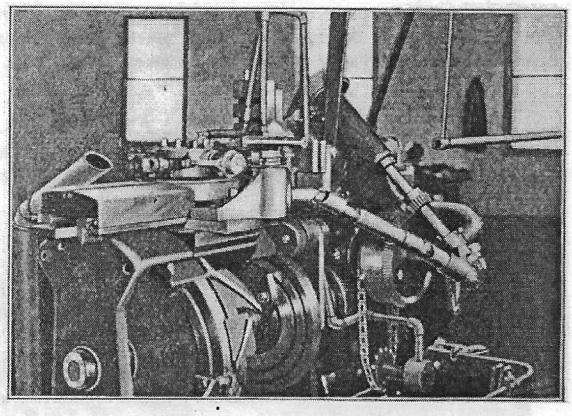


Fig. 2. Back View of Automatic Screw Machine.

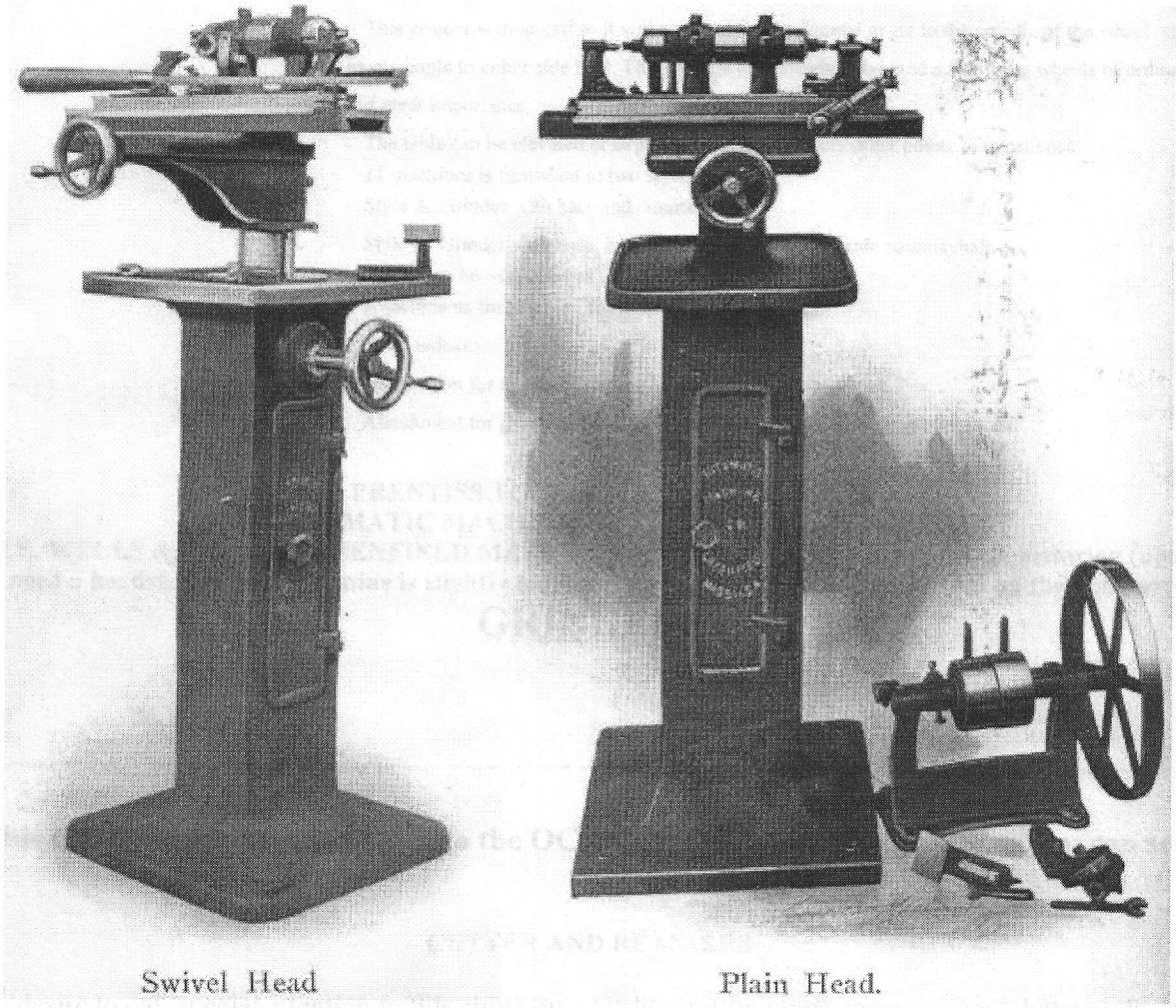
in the length of the machine, doing away with excessive overhang of the turret tools. The cross slides are mounted in vertical instead of horizontal planes, which tends to make them more durable as dirt and chips cannot as readily work into the joints and ruin the sliding surfaces. They are operated by the cam-wheel shown underneath the center of the machine. It carries adjustable cams, secured by T-bolts in T-slots, as is apparent from Fig. 2.

The entire feed mechanism is engaged or released by a clutch on the handwheel shown in front of the machine

updated 1-19-04 b **PRENTISS TOOL & SUPPLY COMPANY.**
AKA: AUTOMATIC MACHINE TOOL CO. GREENFIELD MASS.
AKA: F.E. WELLS &SON CO. GREENFIELD MASS.---Is cast into the machine like this I an restoring (non swivel head) I need a headstock for it, and mine is slightly more strong at the x croslide than shown on the non swivel head.

GRINDERS

CUTTER AND REAMERS



Swivel Head Plain Head.

GRINDERS

CUTTER AND REAMERS

We desire to call special attention to this simple machine for grinding milling cutters, taps, taper reamers, lathe tools, etc., etc. Cutters to 6 Inches in diameter, both spiral and straight, reamers **14** inches and less in length can be ground in this machine. It is made from new and improved patterns. All slides are covered to protect them from dust and emery. The bearings are covered with dust caps and are adjustable for wear, and the ways are gibed, so that the machine can always be kept in good working order. The swivel slide is graduated on one end and provided with a clamping device for securing it in any desired position. It is operated by a lever, which can be removed instantly when desirable. The flat rest can be fastened in position or removed by simply tightening or loosening the clamping nut.

An attachment is furnished for grinding all kinds of end mills, bevel milk, side cutting mills, angular cutters, etc., and with a special attachment (which is extra) all kinds of involute gear cutters and small cutters of special form which require grinding on the face of the tooth. This attachment is graduated on its surface and is reamed for 3_{4}-inch arbor.