

UNIVERSAL AUTOMATIC SCREW MACHINE.

The reputation of American manufacturers throughout the world for making machines with interchangeable parts has been won by the use of machinery of the class illustrated; but the machine here shown is in many respects a great improvement over those formerly used.

This machine can be changed to adapt it to any class of work by the aid of auxiliary parts which may be readily attached or removed. It was designed by Mr. Lavigne, of the Lavigne Automatic Machine Company, of New Haven, Conn., and is intended to avoid the necessity of building a number of styles of machines each adapted to only one class of work, and to render it really universal in its application.

The frame of the machine is arranged to receive the various parts, shaft, cam disk, cam drums, worm gear, and differential gear, all of which are so located as to make them accessible, and permit the attachment of auxiliary parts without disarranging other parts of the machine.

Extending through the center of the machine is a splined shaft, to the extreme ends of which are keyed two large drums, provided upon their peripheries with a number of cams, designed to engage anti-friction rolls on the studs which impart movement to various parts of the mechanism.

This screw machine is provided with the usual hollow arbor and revolving turret carrying the various tools. It is also provided with mechanism for rotating the turret to bring the different tools into action at the proper time.

The turret is rotated positively, and securely locked each time it is moved to a new position and at the same time it is locked down, thus causing the tool to make a smooth cut, which it could not do if the turret were allowed to move or vibrate while a cut is being taken. All this is accomplished without the use of springs of any kind. Where the number of tools used is less than the number of holes in the turret, the latter may be revolved to the tool required without the necessity of moving the turret forward; this is accomplished by a star gear and a series of pins and cams on the periphery of the turret drum. This arrangement saves time and wear and facilitates getting out work.

The turret is provided with from four to six holes, according to the number of turret tools required to produce the work. The turret on the extreme rear motion of the slides is released, and automatically on its forward motion it is clamped downward to the slide, at the same time locked by a ring locking bar, extending the full length of the slide. This bar has long bearings, and is provided with take-up gibs operated by screws for taking up wear and for realinement of the turret with the spindles.

The differential gear mechanism gives speed from 1 to 35, and is constructed so that it may be taken apart without disturbing the other parts of the mechanism.

The cross carriage or cut-off carriage is set on a movable holder, which may be set to any distance from the head and there rigidly secured.

The cross slide is furnished with two tool posts. An auxiliary turret attachment can be applied to the cross slide so as to allow of the use of one or more tools as may be required by the work being done.

A micrometer applied to the cross slide permits of taking up the wear on the tools or of adjustment to compensate for any variation in the setting of the cross-slide cams.

The tool posts receive forming and cutting off tools which can be ground on the cutting surfaces until they are entirely used up without changing their shape, thus enabling the machine to produce work of uniform size until the tools are discarded.

The cross slide and cross-slide holder may be moved toward the tail end of the machine, so as to leave ample space to remove the chuck and spring collets, and may be returned to its former position without dis-

turbing the tools or the setting of the tools on the cross slide.

A lever attached to the closing cam, on the rear end of the spindle, operates the releasing and lightening on the stock, and will indicate to the operator by grasping same the tension that is brought to bear on the finger which embraces the stock.

The cam disk operates the shipping levers on both the differential gear and the spindle. This disk being located directly under the spindle and differential, makes it convenient for setting the machine for close work.

For long or heavy cuts, demanding a taper where side-forming tools are impracticable, a simple attachment is furnished for advantageously accomplishing the desired result. A single-point over-shot box tool is directly connected with a small horizontal gear wheel. This latter on the advance of the turret engages with racks arranged on either side of the gear wheel, as the nature of the work may require. The gear wheel revolves on these racks in either direction, and the cutting tool in turn is either raised or lowered as it advances on the work. Straight turning may be done at any point of the operation by omitting the properteeth on the racks. On the return of the turret the gear wheel necessarily reverses the motion of the advance, and the cutting tool returns to its original position. By entirely omitting the racks, a straight cut will be obtained. But one box tool of this kind is necessary for each machine, and is universal in its use.

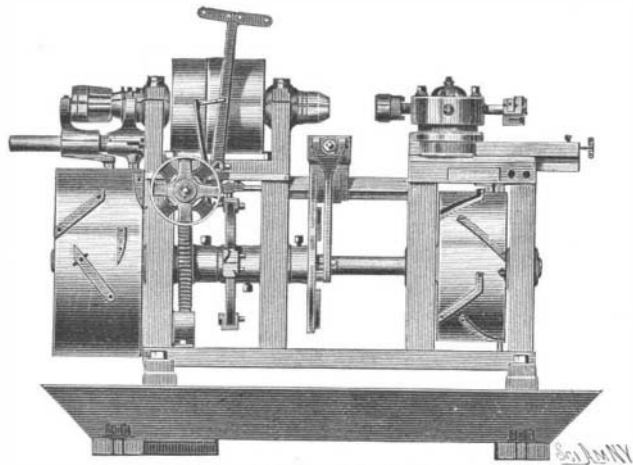


Fig. 1—SCREW MACHINE.

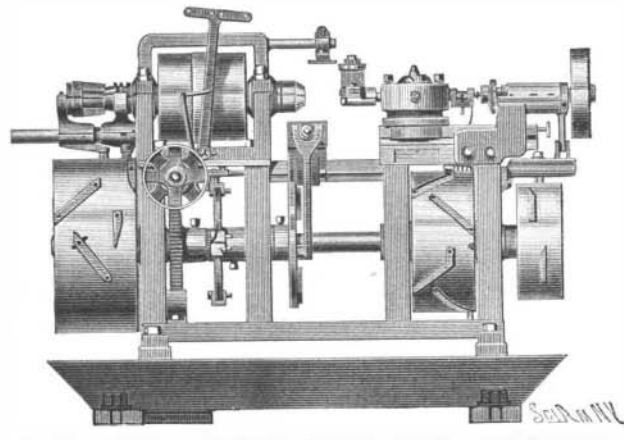


Fig. 2—SCREW MACHINE WITH REAR ATTACHMENT.

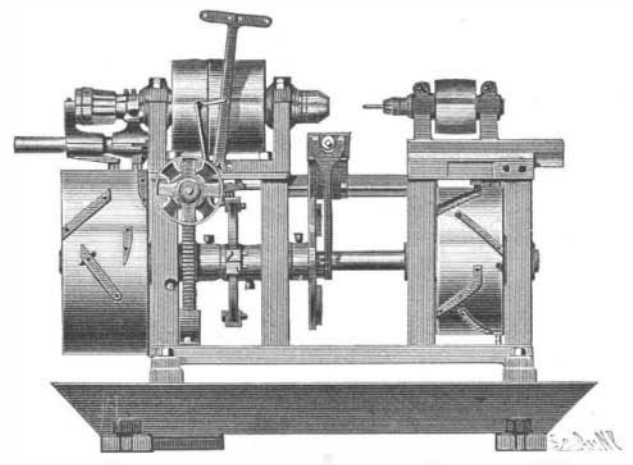


Fig. 3—STUD MACHINE WITH DRILLING ATTACHMENT.

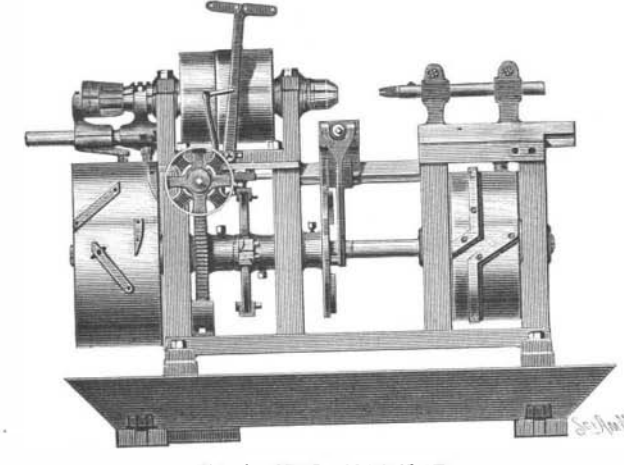


Fig. 4—STUD MACHINE

Furthermore, when regular straight work is required, the racks are removed from the overhanging arm and the circular graduated index plate on the top of the box tool can be set to the one-thousandth of an inch, thereby obtaining any size desired. Remarkable results in both straight and taper work are obtained in this way.

Where it is necessary to finish both ends of a piece, the rear end attachment is used. The piece, on being cut off, is retained in a holder and carried with the turret. When opposite its original position, it engages with the rear end attachment, and is threaded, drilled, or slotted, as may be required. This does not interfere with the original operations, which are going on independently at the same time with it. When this attachment is not required, it can be detached from the machine.

Each machine is provided with a rotary oil pump, which is directly connected with the differential gear shaft, and insures a sufficient supply of oil to the tools when in operation.

Countershaft for each machine has self-oiling boxes, three-step cone differential gear pulley, and necessary pulley for spindle. The step-cone pulley has friction clutch and self-oiling boxes.

These machines are applicable to a great variety of work, and are not limited to the production of finished pieces from the bar. Blanks of any description can be fed and machined with the aid of a magazine feed attachment. One operator can run from five to ten machines according to the character of the work.

In the accompanying cuts, Fig. 1 is a regular screw

machine for producing plain screws, which require operations only on one end; Fig. 2, screw machine with rear end attachment, for producing work requiring operations on both ends; Fig. 3, roll machine, for producing work requiring a hole in the center with various formed shoulders on the outside, or plain if required. The pulley on the back slide is added to give increased production, and more accuracy to the drill than could be obtained with a stationary drill; Fig. 4, plain stud machine, which is especially adapted for making studs or pieces which require only cutting off to length, or with various shoulders on the periphery of the stock.

The Lavigne universal automatic screw machine was invented and introduced by the Lavigne & Scott Manufacturing Company, about two years ago, and these machines met with such success that it became necessary that the facilities for manufacturing machines should be greatly enlarged. The result was the founding of the Lavigne Automatic Manufacturing Company as successors to the Lavigne & Scott Manufacturing Company.

They make machines of 15 different sizes, of which the smallest has a capacity of $\frac{3}{8}$ inch, and the largest 4 inches. The weights of the machines range from 485 pounds to 5,650 pounds. All parts are made by special gages and are interchangeable.

Putty for Parquet Floors.

In reply to a question on this subject, The Painters' Magazine offers the following:

The recipe for putty referred to is a thorough mixture of paper, preferably blotting paper, which has been soaked in boiling hot water until pulp is formed, which is then mixed with glue, also dissolved in water. To this bolted whiting is added in sufficient quantity to make a fairly stiff putty by kneading the mass, which is pressed into the cracks and smoothed off with the spatula or putty knife. However, this putty is recommended for large cracks only, because unshrinkable, but is scarcely adapted for shallow cracks in a parquet floor. For this purpose we would recommend 1 part white lead in oil, mixed with 2 or 3 parts of bolted whiting and enough coach varnish to make a stiff paste. If the work must be hastened, coach japan may be substituted for part of the coach varnish. This putty will resist moisture, and when dry and hard may be sandpapered or rubbed, and it may be tinted with color, if required to match the color of the wood.

The Current Supplement.

The current SUPPLEMENT, No. 1228, contains many articles of great interest. "Greek Architecture—The Lighting of Temples" is one of Prof. Aitchison's interesting Royal Academy lectures. "Geodetic Operations in the United States" describes the important work carried on by the survey. "Mammoth Ivory" is an article by R. Lydekker. "The Grand Cañon of the Colorado" is by Prof. Ralph S. Tarr, of Cornell. The usual notes and consular matter are published.

Contents.

(Illustrated articles are marked with an asterisk.)

Air plant, liquid*.....	36	Inventions recently patented.....	44
Alloys, corrosion of, in sea water.....	35	"Kearsarge," battleship*.....	53, 39
Appendix, vermiform.....	42	Life buoy*.....	40
Battleship "Kearsarge" *.....	33, 39	Liquid air plant*.....	36
Bicycle trip, fastest*.....	41	Locomotives, Schenectady.....	34
Birds, nocturnal flight of.....	37	Notes and queries.....	45
Blue grotto, American.....	38	Notes and receipts, miscellaneous.....	42
Books, new.....	44	Photographic materials, preservation of.....	38
Cruiser "Chicago" *.....	33, 39	Putty for parquet floors.....	43
Curio factories.....	42	Ride, bicycle.....	34
Darning machine*.....	38	Sash balance*.....	38
Electric heating.....	35	Screw machine*.....	43
Engine, rotary*.....	38	Steamers, ocean, speed and size of.....	35
Geyser region, Alaska.....	40	Supplement, current.....	45
Gun, 16-inch.....	34	Telephones of the world.....	42
Heating, electric.....	35		
Hydrogen, liquefying.....	40		
Inventions, index of.....	45		