NEW POWER PUNCHING PRESSES.

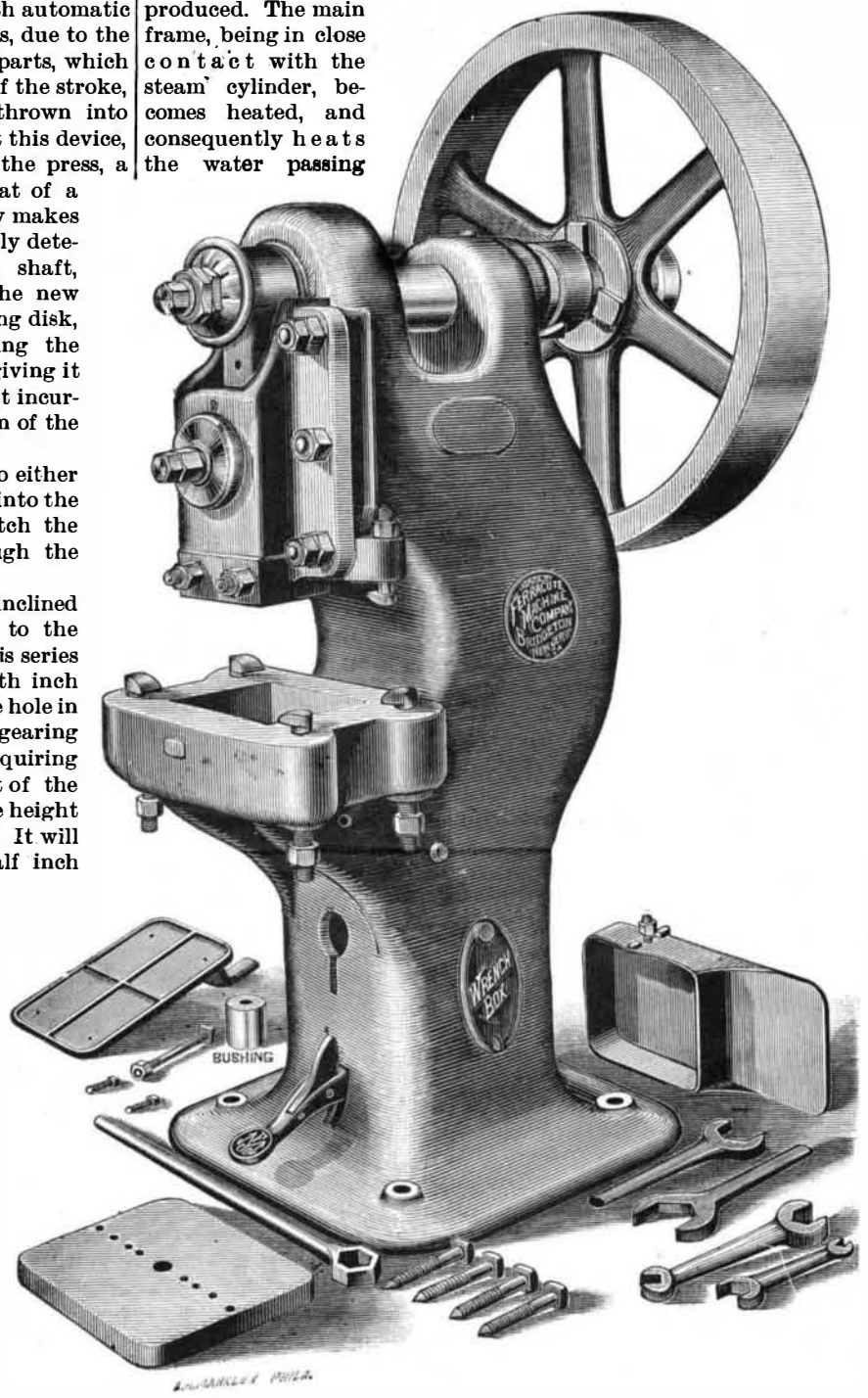
The press illustrated herewith represents one of a series of improved punching presses which have just been put on the market by the Ferracute Machine Co., of Bridgeton, N. J. These presses are especially adapted for cutting, punching, and forming heavy metals in the manufacture of such articles as nuts and washers, hardware, drop forgings, etc. The frame is cast in the form of a square tubular column, with massive internal ribs, and widening out into a well extended base. The general design is such as to give the most strength and to permit of the most convenient handling of the dies and material. The heavy forged steel crank shaft extends from the front to the back, and is arranged with a special view to making it easy to attach cams for working automatic devices. The front end of the crank pin is arranged with a view to the same purpose. The wide slide bar is of dovetail section, extends up to the shaft, and, having great length of bearing, gives firmness and accuracy in the working of dies. The gib for the slide bar is clamped fast to a flat face, so that it cannot work loose, and is provided with a new eccentric adjustment for taking up wear, instead of the usual set screws.

A simple and durable automatic clutch is so arranged that the shaft cannot make more than one revolution by one action of the treadle. It consists of a sliding wedge, which causes a pin to enter one of the holes in the steel part of the fly wheel hub. The fly wheel of course runs loose on the shaft, when out of action. There being four holes (or more in the geared presses) on the wheel, the operator never has to wait more than one-fourth of a revolution for the press to start, and the time thus saved is considerable in fast-running presses. This clutch is provided also with a "safety pin" to lock it, allowing the shaft to be revolved to any position, and the dies adjusted, while the fly wheel is in motion, thus dispensing with the need of a countershaft. The sliding wedge of the clutch is so arranged that it can be made to stop the shaft at the exact point required, without the use of a friction brake.

By means of a treadle lock, operated in either direction with the foot, the treadle can be fastened down for continuous running. The die clamps consist of hook-headed steel bolts, sliding in long true holes, which firmly hold the dies without the need of removing nuts, etc. A new spring fly wheel obviates the great difficulty heretofore experienced with automatic clutches, especially in large heavy presses, due to the inertia of the shaft, pitman, and other parts, which stop when the slide bar reaches the top of the stroke, but which have to be instantaneously thrown into gear when the clutch is tripped. Without this device, the result has been, at each starting of the press, a heavy blow, equal in many cases to that of a sledge upon an anvil. This blow not only makes a very unpleasant noise and jar, but rapidly deteriorates the various parts of the wheel, shaft, and clutch which receive the impact. The new spring wheel is furnished with a yielding disk, which starts the shaft gradually, making the press run more easily and quietly, and giving it capacity for a much higher speed, without incurring the evils due to a violent percussion of the parts, and the consequent noise.

The shelf shown in cut may be bolted to either side of the press, and the pan can be slid into the opening in the front of the base, to catch the punchings or such articles as drop through the dies.

It may also be reversed, and used as an inclined chute to catch work and slide it over to the left of the press. The smallest press in this series will cut an inch round hole in one-eighth inch iron, while the largest will cut the same size hole in one inch iron. They are so arranged that gearing can be added to adapt them to work requiring slow motion and great power. The weight of the press illustrated is 3,000 pounds, and the height from floor to top of fly wheel is 75 inches. It will easily punch a one inch hole through half inch iron.



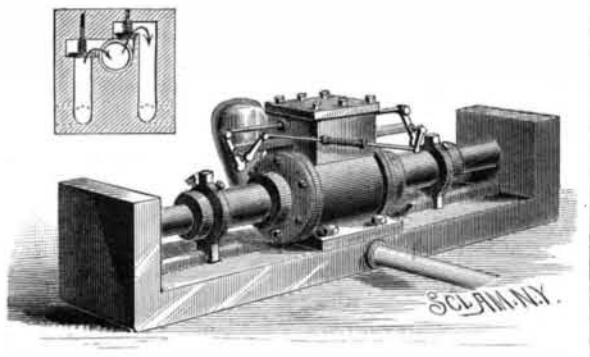
NEW POWER PUNCHING PRESS.

The Wax Process for Engraving.

By means of the new and ingenious little instrument known as the hyalolyphotype, or hot pen, drawings can be made on glass or glassy substances with a waxy composition, which is solid and somewhat hard at ordinary temperatures. The pen is so contrived that it can be heated by either gas or an electric current, and the waxy material flows easily from the heated pen, setting so quickly on the glass that cross hatching can be done more rapidly than with ordinary pen and ink, without risk of blocking up the angles; corrections, too, can be made with the greatest ease by means of a penknife, which leaves the surface afterward intact. After the drawing has been made, the plate is etched by fluoric acid, and when complete it can be either electrotyped, stereotyped, used direct, or applied to any purpose for which engraved surfaces are required.

BOILER FEEDER.

The steam cylinder is secured in the middle of the base plate, and has the usual slide valve and piston, the latter being provided on each side with a hollow plunger which projects beyond the cylinder and is provided at its outer end with a cap. Near each cap is an adjustable ring, having a downwardly projecting forked lug sliding on a raised guide secured to the base. Into



McGEHEE'S BOILER FEEDER.

each of the hollow plungers projects a cylinder, held at one end in the end plate, in which it communicates with the inlet and outlet valve, as shown in the sectional view. The inlet valves at each end lead to a channel in the base, in the center of which the inlet pipe is held; and the outlet valves lead to a similar channel in the opposite side of the base, communicating with the discharge pipe, which is provided with an air chamber and check valve. The slide valve is so arranged as to be operated at each stroke by one of the rings secured to the ends of the plunger.

The piston moves forward and backward, and imparts a reciprocating motion to the plungers, which slide over the stationary cylinders. This action draws water into the cylinders through the inlet valves and their channel, and discharges it on the return stroke through the outlet valves and their channel into the boiler. The machine being double acting, a constant flow of feed water is produced. The main frame, being in close contact with the steam cylinder, becomes heated, and consequently heats the water passing through it. This invention has been patented by Mr. C. K. McGehee, of Liberty, Miss.

Steel Wire Gun.

The *Times* states that the new experimental 9·2 in. wire gun has just been tried at the Government proof butts, Woolwich Arsenal, with satisfactory results. The War Department have issued orders for the construction of several more guns of the same description. The Government pressure test for the gun was 65 tons to the square inch. The new weapon weighs 25 tons, and is 33 ft. long. The steel wire is coiled round the inner tube at the breech and nearly up to the trunnions, and consists of 78 layers. The wire is made in lengths of 2,400 yards, and weighs 20 lb. to the yard. It is flat, and put on by a specially designed machine at a pressure of about 40 tons to the square inch. The lengths are joined together by being brazed and riveted over a considerable length. After the wire has been put on, a steel jacket is shrunk on over it.

Fireproofing and Preserving Compound.

BY NOTZ & KONRAD.

A solution is made of 10 kil. sulphate of ammonia, 1 kil. carbonate of ammonia, ½ kil. borax, 100 grm. bichloride of mercury in 30 lit. of water.

To which solution the extract of 2 kil. peppermint is added, which is obtained by hot maceration of the herb in 6 lit. water; then 150 grm. phenic acid are added, and lastly 6 kil. tungstate of soda diluted with 94 lit. water, in order to prevent the formation of crystals of the various salts and to maintain the fluidity of the chloride of lime which is formed. The whole is vigorously stirred, and heated to 70° C. At the same time, the communication is opened with a retort in which 1 kil. Peruvian balsam and 300 grm. camphor are distilled off in 2 kil. ether, and the distillate stirred in with the above mass. The tissues impregnated with the composition are rendered incombustible, imputrescible, and are never attacked by insects, worms, etc.—*Mon. d. l. Teint.*

Transporting Natural Gas.

Colonel Thomas P. Roberts, of Pittsburg, Pa., obtained a patent for a process of transporting natural gas long distances, which he is confident overcomes all the difficulties resulting from friction and consequent loss of pressure. He proposes, instead of forcing the gas, to draw it at low pressure through large conduits by means of exhaust fans at distances varying from ten to forty miles, according to the character of the ground to be traversed. These fans, which would be boxed into the conduit, would be about sixteen feet in diameter, and would be driven by engines of about twenty horse power. They would only revolve at the rate of from thirty to fifty times a minute—a slow rate as compared with the 2,000 revolutions a minute made by blast engine fans. The pipes would be made of sheet iron, about five feet in diameter.

The patent provides for an alternative method. This is to lay a second pipe under the other one when ascending a hill. This pipe is to be perforated with burners, the heat from which will rarefy the gas. At the top of the hill a tank of water will be placed, from which a pipe would be laid over the gas pipe on the descent of the hill. This pipe also will be perforated to discharge a spray over the gas pipe, thus causing a condensation of the gas. This system will cause the main to act as a siphon, and will maintain an even flow over the hill.

The main feature of this process is that the gas is allowed to flow at about or a little below nominal pressure, and that thus the friction of the gas is reduced to almost nothing. The velocity of the gas would under this system, Colonel Roberts estimates, be not quite ten miles an hour, and the force required would be a small fraction of an ounce per square inch. The only leakage to be provided for would be the air trying to get into the pipe, and paint, Colonel Roberts says, would be ample to prevent this. The estimated cost of this method of transportation, including fans, pipes, right of way, etc., would be about $3, and it would supply three million cubic feet of gas per hour.—*The Coal Trade Journal.*

THE greatest length of Lake Michigan is 300 miles; its greatest breadth, 108 miles; mean depth, 690 feet; elevation, 506 feet; area, 23,000 square miles.