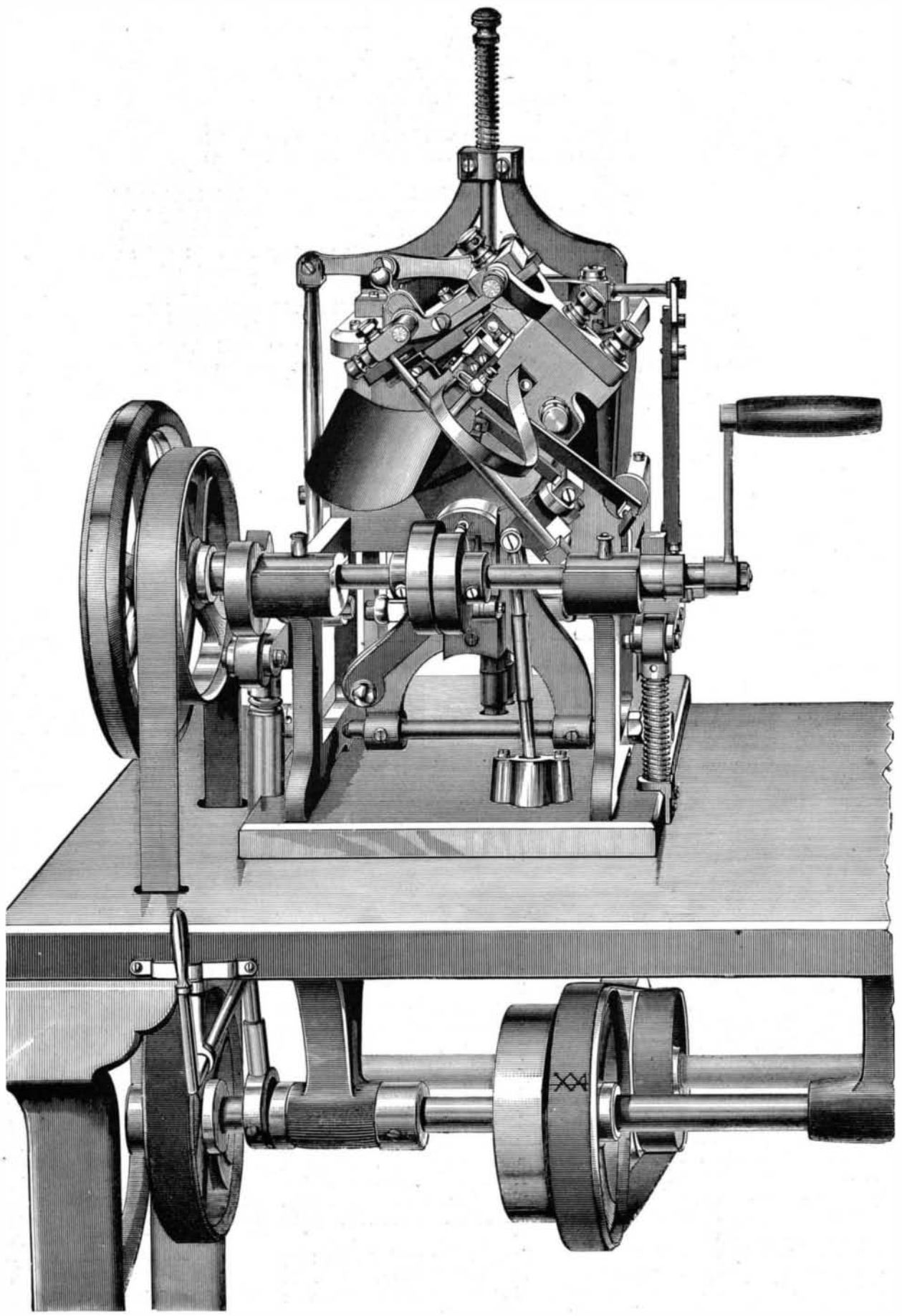
TYPE CASTING MACHINE.

Great advances have been made in the methods of casting type for printing purposes from the time of the wooden blocks and rude types of Laurentius, of Haarlem, to the improved hand moulds of Archibald Binny, of Philadelphia, at the beginning of the present century. By the latter as many as six thousand types per day were produced. The hand moulds were supplanted in 1845 by the complex and effective American type-casting machines, which have wrought an important revolution in the business.

Our engraving represents a type-casting machine made by Messrs. MacKellar, Smiths & Jordan, of Philadelphia. The average production for this machine is about one hundred per minute for the ordinary sizes of printing type, being far beyond the amount of product of the earlier methods. The machines may be operated either by hand or power. The advantage in using power is that it enables one man to attend to two machines.



STEAM TYPE CASTING MACHINE.

Type metal is an amalgam of lead, antimony, copper, and tin in such proportions as to produce a materia hard but not brittle, ductile yet tough, flowing freely, yet hardening quickly. Each letter is first cut in reverse shape on the end of a short strip of steel, the greatest care being taken to insure accuracy of proportion and harmony of appearance in the letters of the entire alphabet. The least variation is inadmissible, as it would destroy the harmonious effect of the types when composed or formed into columns or pages. The steel strips when finished are termed punches; and after criticism and approval, each punch is placed in a stamping machine, and a deep impression made of it in one side of an oblong piece of copper near its end. These pieces of copper are called matrices. They are dressed and fitted up with delicate skill, so that the types cast from them shall be of uniform height and accurate range. They are then ready for use in the casting machine.

The machine casts but one type at each revolution. It consists of a furnace, on the top of which is a small reservoir of metal kept in a fluid state. In this reservoir is a pump, the plunger of which operates in a cylinder in the bottom, and projects at each stroke a small quantity of the molten metal out from a small hole in a spout or nipple in the front face. The mould in which the stem or body of the type is formed is of steel and is movable, being set in place in front of the reservoir, and worked by the action of the same machinery which operates the pump. The copper matrix, containing any special letter stamped into it with the punch, rests with its face against the bottom opening of the mould, being held in position by a curved steel spring shown in the engraving. The method of operation is as follows:

The initial movement of the machine brings the upper opening in the mould opposite to the matrix exactly against the hole in the nipple. A simultaneous action of the pump projects a stream of the liquid metal into the mould with considerable force, at the same time stopping the opening in the nipple by a small plug from behind to prevent the further escape of metal. The next movement draws the mould away from the nipple and opens it, throwing back the matrix, extricating the type, and dropping it by a slide into a box below. This operation is repeated over and over again as rapidly as the crank or wheel of the machine is turned, and a type is cast each time. On the rapidity of the motion depends the quantity produced. Such is the modern type casting machine—turning out one hundred types per minute, or sixty thousand per working-day of ten hours, every one of which is a mite contributed to the spreading of knowledge over the world for good or for evil.

The type as thus formed is passed to boys, who break off the jets or waste ends; then to the dressing-room, where the rough edges are rubbed off on the faces of large circular stones; and finally, they are set up in lines, slipped into a long stick, screwed tight, and the bottom of the type is neatly grooved by a planing-tool. The letters are afterward closely inspected with a magnifying-glass, and all imperfect ones rejected.

MISCELLANEOUS INVENTIONS.

Mr. William Gardner, of New York city, has patented an improved apparatus for keeping lager beer, ale, porter, cider, etc., fresh and lively from the time it is tapped until the contents of the cask are exhausted. The invention consists of a combination of devices which cannot be clearly described without engravings.

An improved fire lighter, patented by Mr. Samuel M. Craig, of Austin, Tex., consists in the arrangement of a clamp holding a match and a slide provided with a roughened surface by means of sandpaper or some other suitable material, so that when the rough surface is drawn across the head of the match, the match is ignited and will light the kindling materials.

An improvement in tellurians has been patented by Mr. Gideon McBride, of Dover Hill, Ind. The object of this invention is to furnish for the use of schools an improved tellurian of simple construction, by which the elliptical orbit of the earth around the sun and the orbit of the moon around the earth, together with all the phenomena resulting from the relation of sun, earth, and moon together, may be fully and lucidly illustrated, embracing among others the succession of day and night, the changes of the seasons, the changes of the moon, solar and lunar eclipses, the entrance and progress of the sun into and through each of the twelve signs of the zodiac, the entrance and progress of the earth into and through each of the twelve months of the year, etc.

Mr. Fortonato C. Zanetti, of Bryan, Texas, has patented improvements in the construction and arrangement of cabinets for containing sewing, writing, and shaving materials and various other articles of domestic use in frequent demand.

Mr. John Boyd, of La Grange, Ind., has patented an adjustable hay rack for wagons or sleds, that may be lengthened or shortened at will. The sections can be easily separated from each other and handled by one person. It may be lengthened or extended from twelve to twenty feet or more to fit any length of wagon or sled within reasonable limits.

Mr. John G. Barrington, of North Sidney, Nova Scotia, has patented an improved oil cup or lubricator for those parts of machinery that have a reciprocating upward and downward movement; it consists of a globular cup provided with an interior vertical valve and a screw cap carrying a tube provided with a regulating spring and rod. A concave plate of sheet metal is attached to the top of the tube. As the machinery to which it is attached moves up and down the resistance of the air to the movement of the plate operates the device.

An improved attachment for cultivators, which will do away with stay rods or chains, will give a direct draught, and will prevent any down draught upon the horses' necks, has been patented by Mr. Jonas Dierdorff, of Goshen, Ind

Mr. Moritz Leiner, of New York city, has patented an improved combined slate cleaner and pencil holder, which consists in a vessel or cup provided with a sponge upon its lower part, and having a stopple provided with sponges at one or both ends, and the cord provided with the loop and the hook.

An improved egg carrier, patented by Mr. George W. Peck, of Omaha, Neb., is designed especially for carrying eggs, but it may be used for other purposes. It consists in a box having a cover made with cleats or flanges to rest upon the edge of the body. The body is made with a cross partition projecting above its edge so as to pass in between the side cleats of the cover and rest against the cover. The box is provided with a novel and efficient fastener.