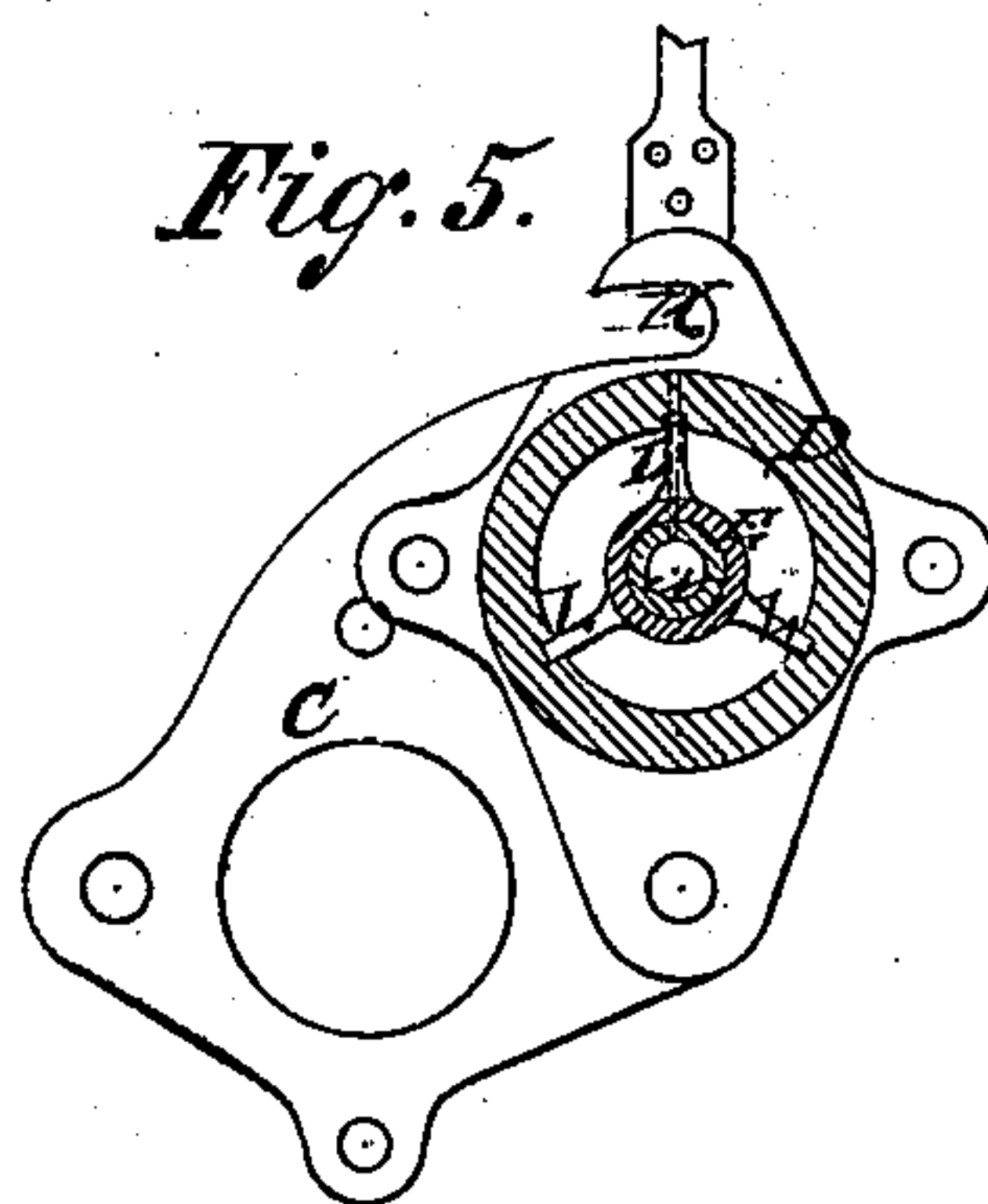
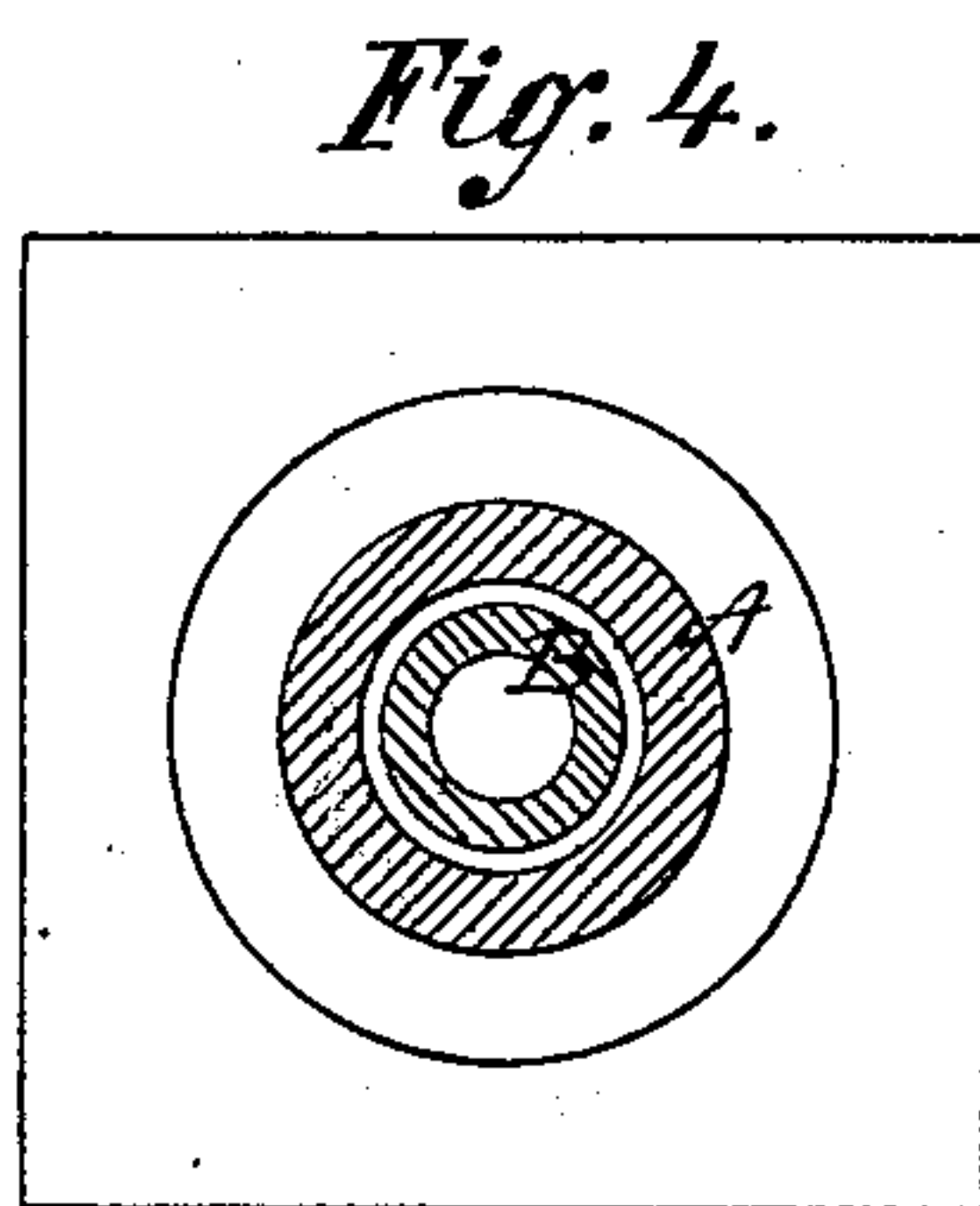
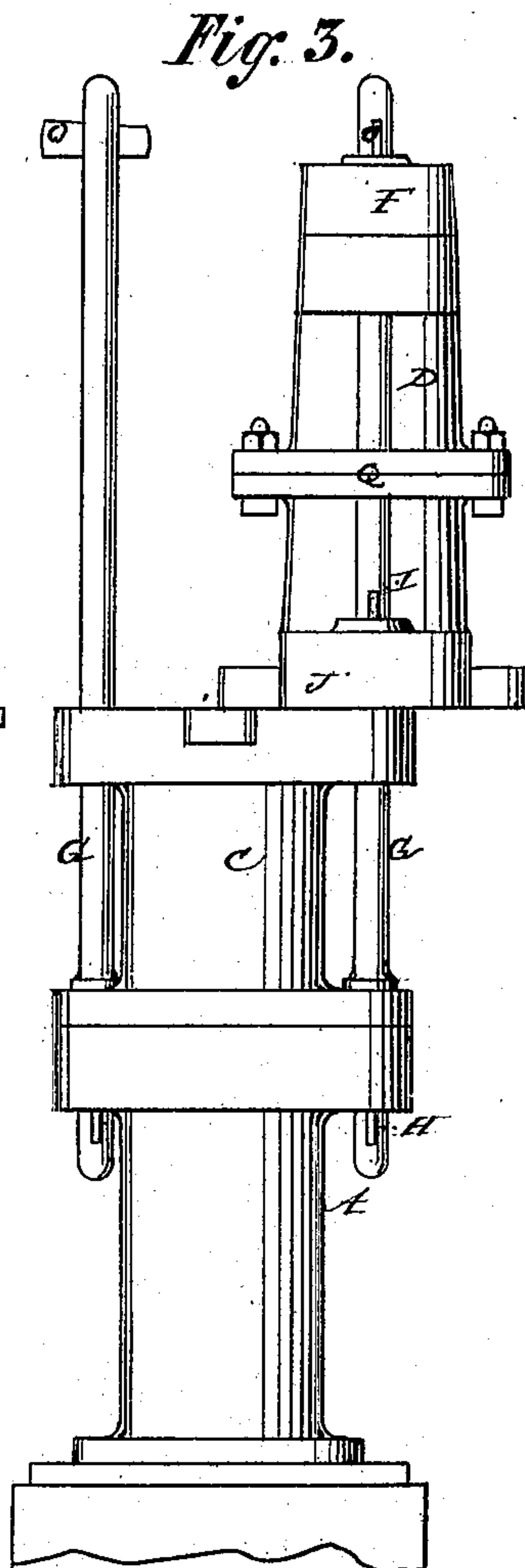
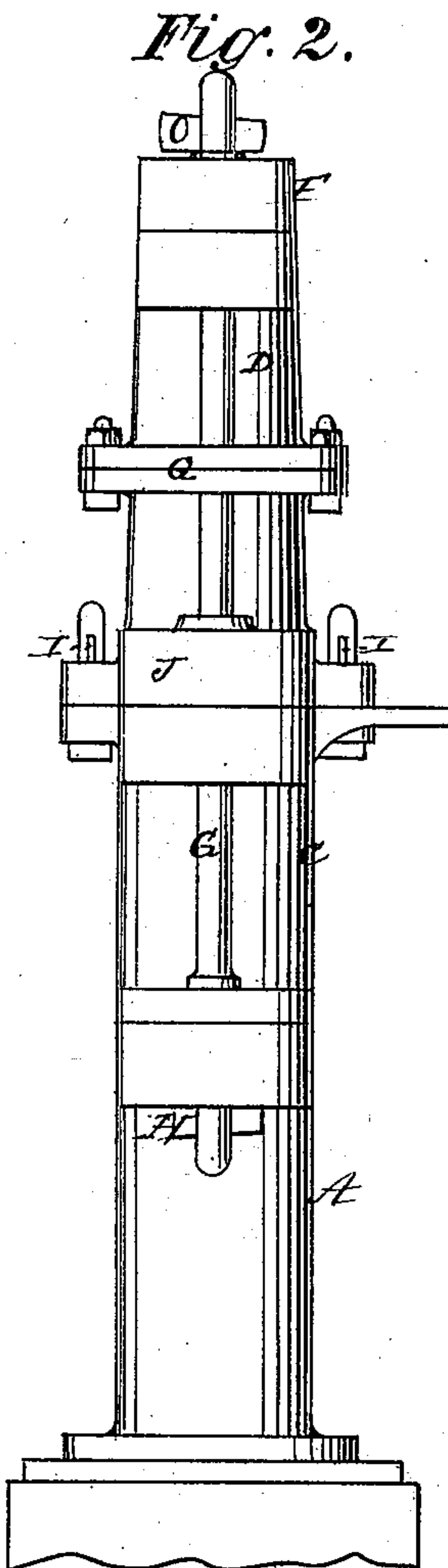
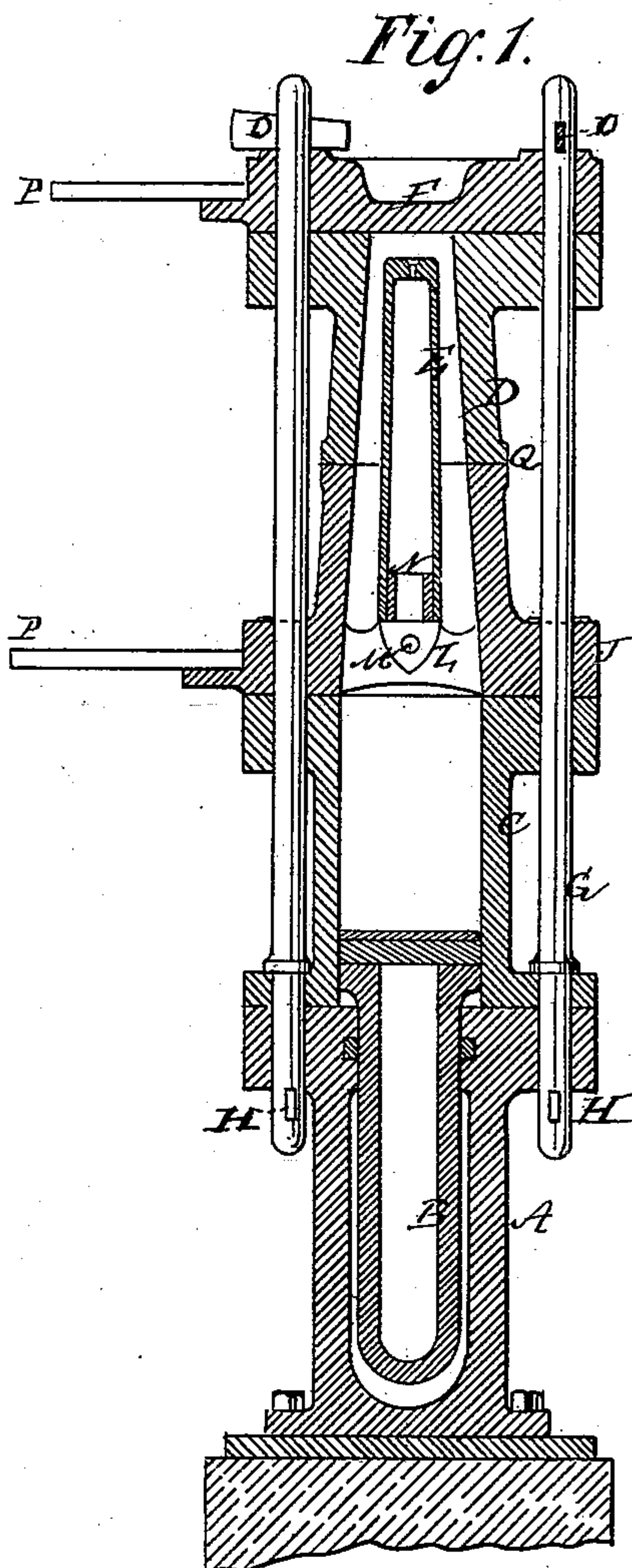


W. MORGAN.
Machine for Making Retorts, Crucibles, &c.
No. 202,366. Patented April 16, 1878.



Witnesses.
J. A. Thayer.
Wm. J. Morgan.

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att'y

UNITED STATES PATENT OFFICE.

WILLIAM MORGAN, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR MAKING RETORTS, CRUCIBLES, &c.

Specification forming part of Letters Patent No. **202,366**, dated April 16, 1878; application filed June 2, 1877.

To all whom it may concern:

Be it known that I, WM. MORGAN, of Jersey City, Hudson county, and State of New Jersey, have invented new and useful Improvements in Machines for Making Retorts, Crucibles, Muffles, &c., of which the following is a specification:

My invention relates to hydraulic presses for molding retorts, &c., of plastic material, comprising, essentially, a ram or piston, operated by a hydraulic press and working in a charging-cylinder, and forcing the material therefrom into a mold containing a mandrel or former, and out of the same after the article is formed.

The improvement consists of the charging-cylinder, fixedly attached to the end of the hydraulic cylinder, in connection with a movable connection of the mold-cylinder to the charging-cylinder, instead of the reciprocating charging-cylinder and stationary mold, as heretofore made, by which only one hydraulic press is required, instead of three, the height is considerably lessened, and the machine is otherwise simplified and cheapened, and it is also more simple to operate. The two hydraulic presses used to close up the charging-cylinder to the mold are not needed in this arrangement.

Figure 1 is a sectional elevation of my improved machine. Fig. 2 is a side elevation. Fig. 3 is a side elevation of the machine, showing the mold shifted to open the cylinder in which the material is charged. Fig. 4 is a section on the line *a b*. Fig. 5 is a section on the line *c d*.

A is the cylinder of the hydraulic press, and B the piston. C is the cylinder, in which the plastic material to be molded is placed to be pressed into the mold by the ram of the piston B, which works in said cylinder. D is the mold, and E the mandrel therein, on which the articles are formed, and F is a removable cap for opening the mold for the discharge of the molded articles.

The cylinder C, which has been heretofore arranged to slide up and down between the head of the press A and the base of the mold by means of a couple of presses attached to press A, for opening to admit the material to be molded, is, in this case, rigidly attached to the head of the press by the rods G and keys

H, and the base of the mold rests on the top of the cylinder C, and is secured thereto by the rods G and keys I when the press is to be operated; but the connection is made detachable for opening the cylinder, to charge in the material to be molded, by fitting the flange J of the mold so as to turn freely on one of the rods G, and making a notch, K, into the hole of the flange for the other rod, so as to enable the mold to swing around, as represented in Fig. 3, off from the top of cylinder C, thus opening it to be charged.

The mandrel or former E is attached to the cross-bar L in the base of the mold D for its support. It is pointed at the lower end, to allow the material to be forced up readily; also slotted, to embrace the bar, so as to be fastened by a pin, M; and it is also fitted over the stud N, to keep it firmly against being pushed aside either way by the material being molded. This connection also makes the mandrel readily detachable, which is desirable.

In practice, there is an air-passage, leading through the base of the mold and the cross-bar L into the base of the hollow mandrel E, to allow air to pass through the top of the mandrel, to prevent a vacuum in the molded article when being pushed off the mandrel and discharged out of the mold. A little valve in the top of the former prevents the material from forcing into the mandrel through the passage at the top when the article is being molded. The cap F also swings around on one of the rods G in the same manner as the mold does on the cylinder C, to open the top of the mold for discharging the articles when finished, and it is fastened the same by keys O when the molding is being made.

The cap and the mold are both provided with a handle, P, to facilitate the opening and closing of them.

In working the machine, the plastic material or substance from which the crucible, retort, or other article is to be made, is first suitably kneaded and worked, and pressed into cakes of suitable size to fit into the cylinder C, which is then filled and closed. The press is then set to work, forcing the material up into the mold, around and over the top of the former, where the bottom of the crucible or other article is formed. When this is accomplished the

mold is opened at the top by swinging the cap around, the press being first stopped a moment to relax the pressure on the cap. The press is then set in motion again, and forces the crucible or other article out the required length, when it is cut off with a wire and removed. The space in the tube of plastic material above the mandrel is then filled with a piece of similar material, which is hammered down with a mallet, to furnish the material for the bottom of the next article. The mold is then closed and the pressure applied as before, and the operations continued as long as the material in cylinder C lasts, when said cylinder is again opened and replenished.

The mold is represented as made in two sections, joined together at Q, which is for convenience in opening it, to adjust the man-

drel E, and for handling it; but it may be made in one piece, if preferred. In this case the mold is arranged above the press; but it may be arranged below, if preferred.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination, in a hydraulic machine for the manufacture of crucibles, retorts, muffles, &c., of a single hydraulic press, with a charging-cylinder fixedly attached to the end of the press, and a mold-cylinder, movably attached to the charging-cylinder, substantially as described.

WM. MORGAN.

Witnesses:

F. A. THAYER,

WM. J. MORGAN.