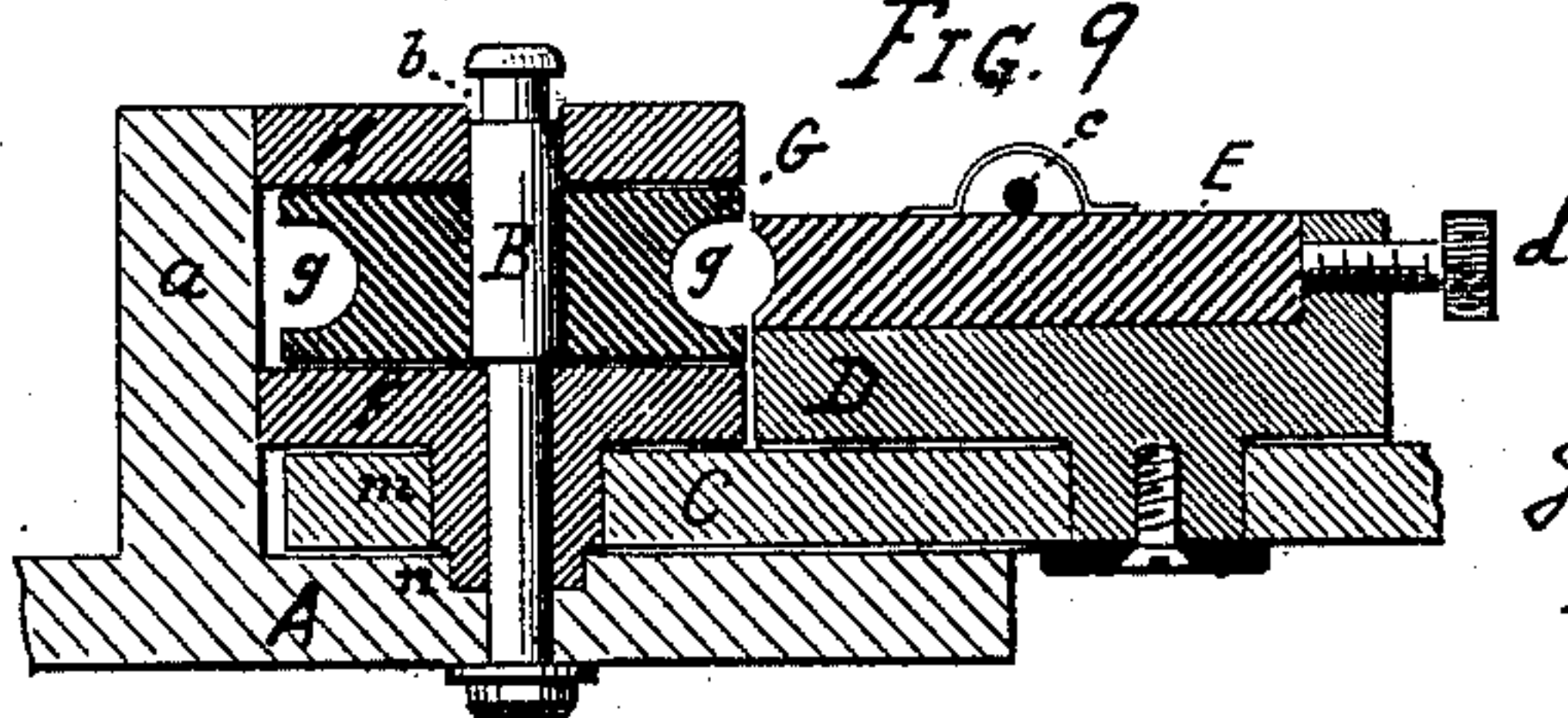
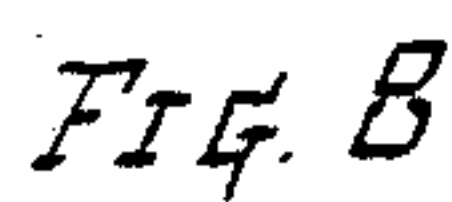
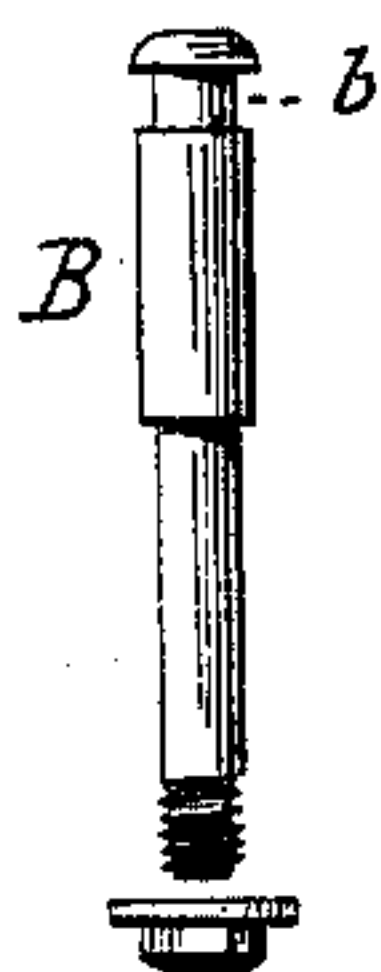
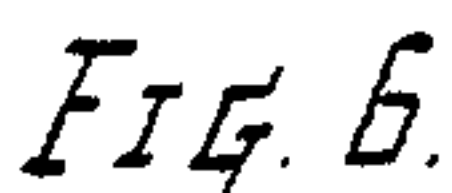
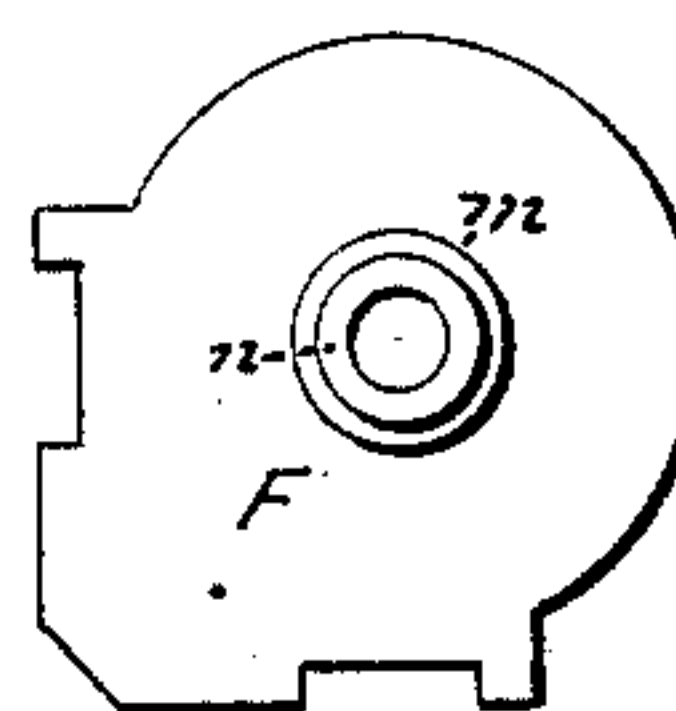
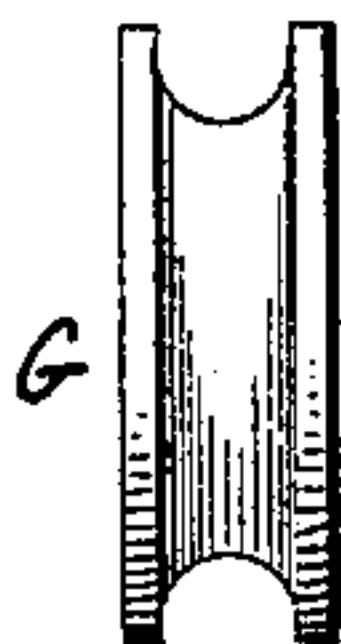
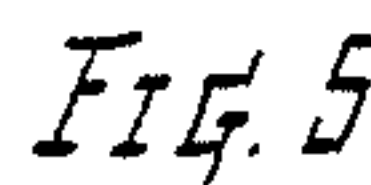
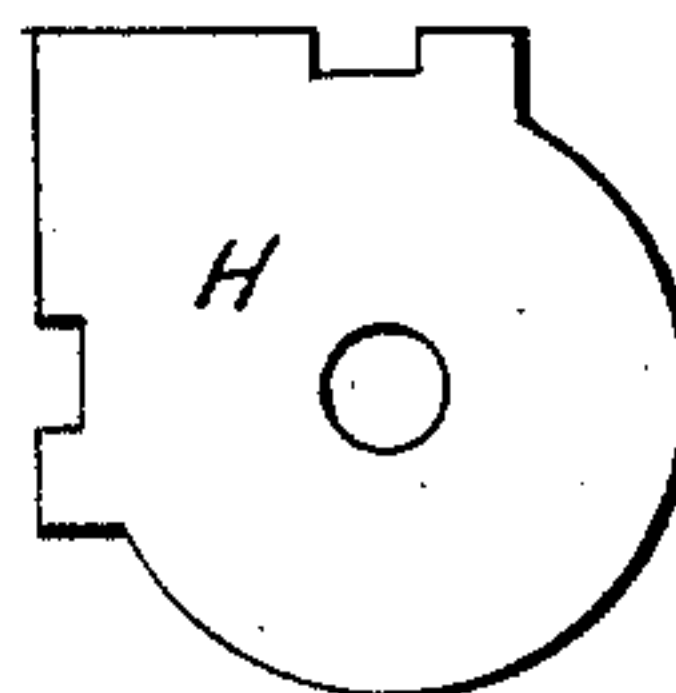
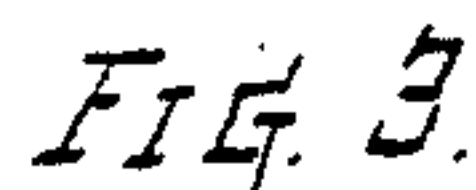
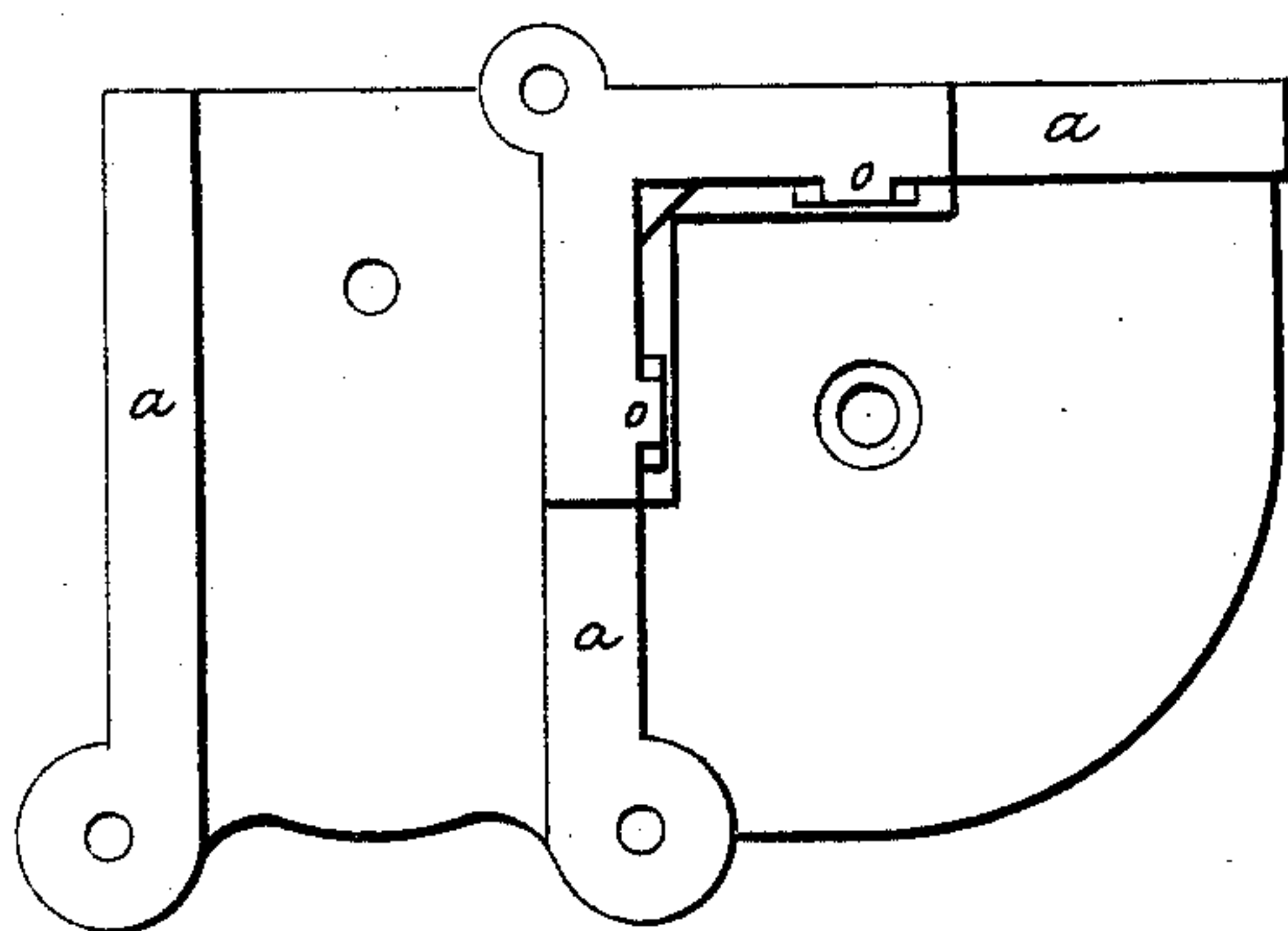
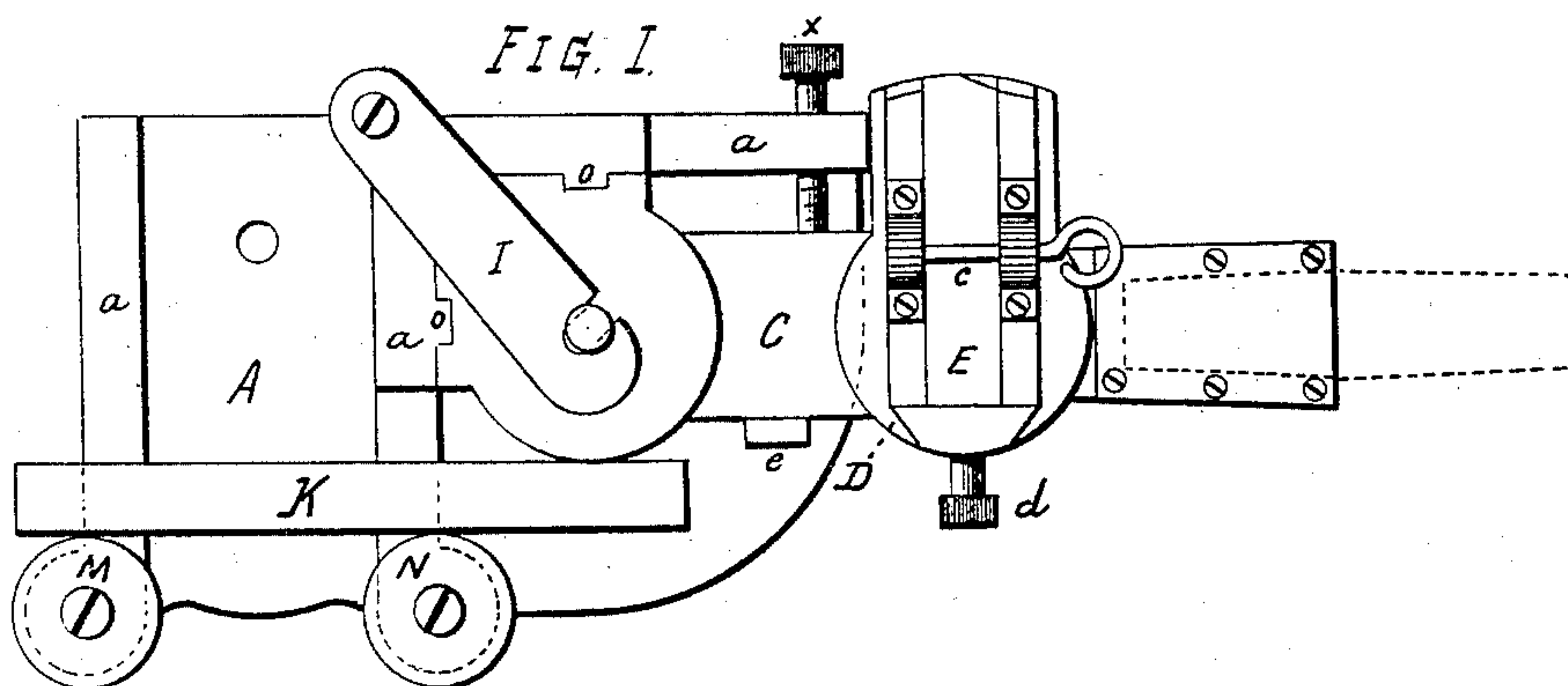


J. M. EVARTS.
Machine for Bending Tubes.

No. 223,037.

Patented Dec. 30, 1879.



WITNESSES
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UNITED STATES PATENT OFFICE.

JAMES M. EVARTS, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR BENDING TUBES.

Specification forming part of Letters Patent No. **223,037**, dated December 30, 1879; application filed August 13, 1879.

To all whom it may concern:

Be it known that I, JAMES M. EVARTS, of New Haven, in the county of New Haven and State of Connecticut, have invented a new and Improved Machine for Bending Pipe, of which the following is a specification.

My invention relates to machines for bending pipe of the kind ordinarily used in buildings for distributing water and gas; and it consists in new combinations and elements, which are more fully described and claimed in the following specification.

In the drawings, which I hereby make a part of this specification, Figure 1 is a plan of the machine. Fig. 2 is a plan of a part of its frame or base. Fig. 3 is a view of the upper cap; and Fig. 4 a view of the lower cap reversed. Fig. 5 shows the roller and its groove. Fig. 6 shows the stud, with its nut, on which several of the parts turn. Fig. 7 is a cross-section of one part, and Fig. 8 a view of the handle. Fig. 9 is a vertical section of a portion of the machine, showing its principal working parts.

To enable those skilled in this class of machines to make and use my improved machine, I will describe its parts and their operation.

A is the frame or base of the machine, and has the upright parts indicated by the letter *a*. B, Fig. 6, is a bolt on which the parts turn, and has the rectangular groove *b*. C, Figs. 1 and 6, is a part turning on the shoulder *m*, Figs. 4 and 9, and has a socket, into which the lever fits, as shown by the dotted lines in Fig. 1. D, Figs. 1 and 9, is a part pivoted to the part C, as shown in Fig. 9, and carries the slide E, Figs. 1 and 9.

The slide E is rectangular, moves in a rectangular groove in the part D, and has a circular groove on its end, as shown in Fig. 9. It is held in its place by the rod *c*, which turns in bearings attached to the part D, as shown in Fig. 1. The rod *c* is curved or bent, and by turning presses on the part E. A set-screw, *d*, Figs. 1 and 9, adjusts the part E. A stop, *e*, Fig. 1, limits the motion of the part D. A set-screw, *x*, Fig. 1, operating as a gage, also limits the motion of the part D and deter-

mines the curvature of the pipe. The lever is of the form shown in Fig. 8, and partially shown by dotted lines in Fig. 1.

The cap F is reversed, as shown in Fig. 4, and has the shoulders *m* and *n*. (Better shown in Fig. 9.) It also has notches, as shown, which fit on the ways *o*, Fig. 1.

The roller G, Figs. 5 and 9, is of the form shown in the figures, and has the groove *g*, specially adapted to a pipe of a particular size. One roller will only bend pipe of the same size, and there must be as many rollers as there are sizes of pipe to be bent, with grooves specially adapted to the several sizes.

The cap H, Figs. 3 and 9, has notches, as shown, which fit on the ways *o*, Fig. 1. By means of the cap H and cap F, with its shoulders *m* and *n*, the strain is partially transmitted to the frame and the bolt relieved.

The part I, Fig. 1, has one of its ends pivoted to the frame, and the other end has a slot fitting the groove *b* in the bolt. It holds the parts on the bolt and allows the rollers to be changed readily.

The part K, Fig. 1, is a straight removable part, rests on the upright parts of the frame, and has a circular groove on the side toward the roller, as shown in section in Fig. 7. The rollers M and N turn on studs attached to the frame, and allow the part K to move easily.

To bend pipe by the above-described machine, the pipe is placed on the upright parts of the machine and between the roller G and part K in the grooves of the two parts. The part D is then turned parallel with the part C, the slide E being adjusted by the set-screw *d* to clasp the pipe in the grooves of the two parts. As the lever is turned toward the set-screw *x* the pipe is firmly grasped in the grooves of the roller and slide and carried forward; the three rollers are set in motion, and the pipe bent to any extent required. As the groove in the roller G is made to fit the pipe, the pipe cannot spread and flatten, and as there is no sliding of the pipe on the roller G the stretching of the pipe is on its outer curve.

By means of the set-screw or gage *x* the pipe may be bent to any required angle, and different pieces of pipe to the same angle.

When the lever and parts connected with it are brought back to the position shown in Fig. 1 the bent pipe may be removed from the machine.

Having described my improved machine, what I claim as new, and desire to secure by Letters Patent, is—

1. The roller G, in combination with the lever, part C, part D, slide E, and set-screw *d*, all the said parts constructed and combined substantially as set forth.

2. The combination, with the lever, roller G, part C, part D, slide E, and set-screw *d*, of the grooved part K, and rollers M and N, as set forth.

JAMES M. EVARTS.

Witnesses:

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