

(No Model.)

3 Sheets—Sheet 1.

E. E. ANGELL.
MANDREL FOR CAN MACHINES.

No. 412,581.

Patented Oct. 8, 1889.

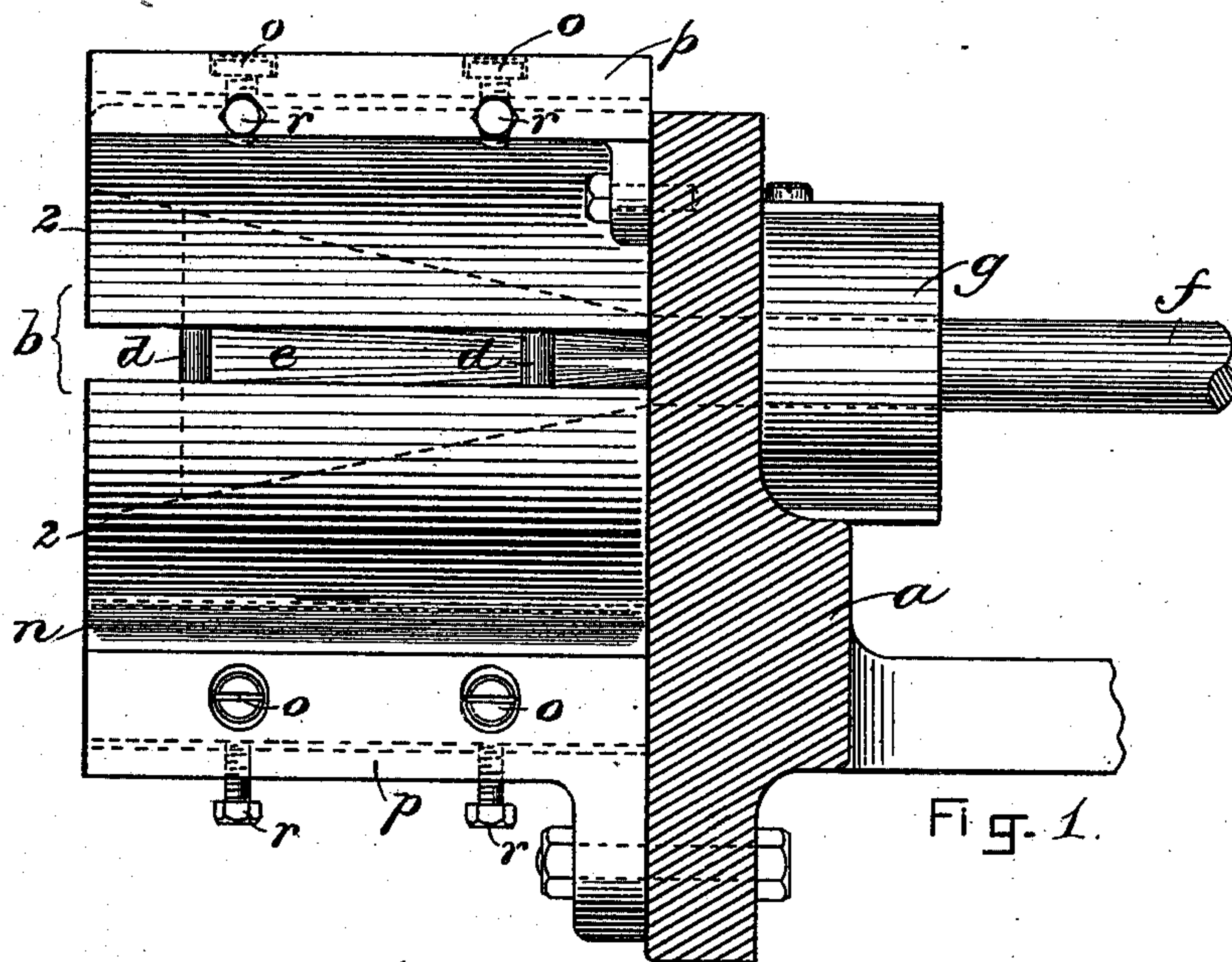


Fig. 1.

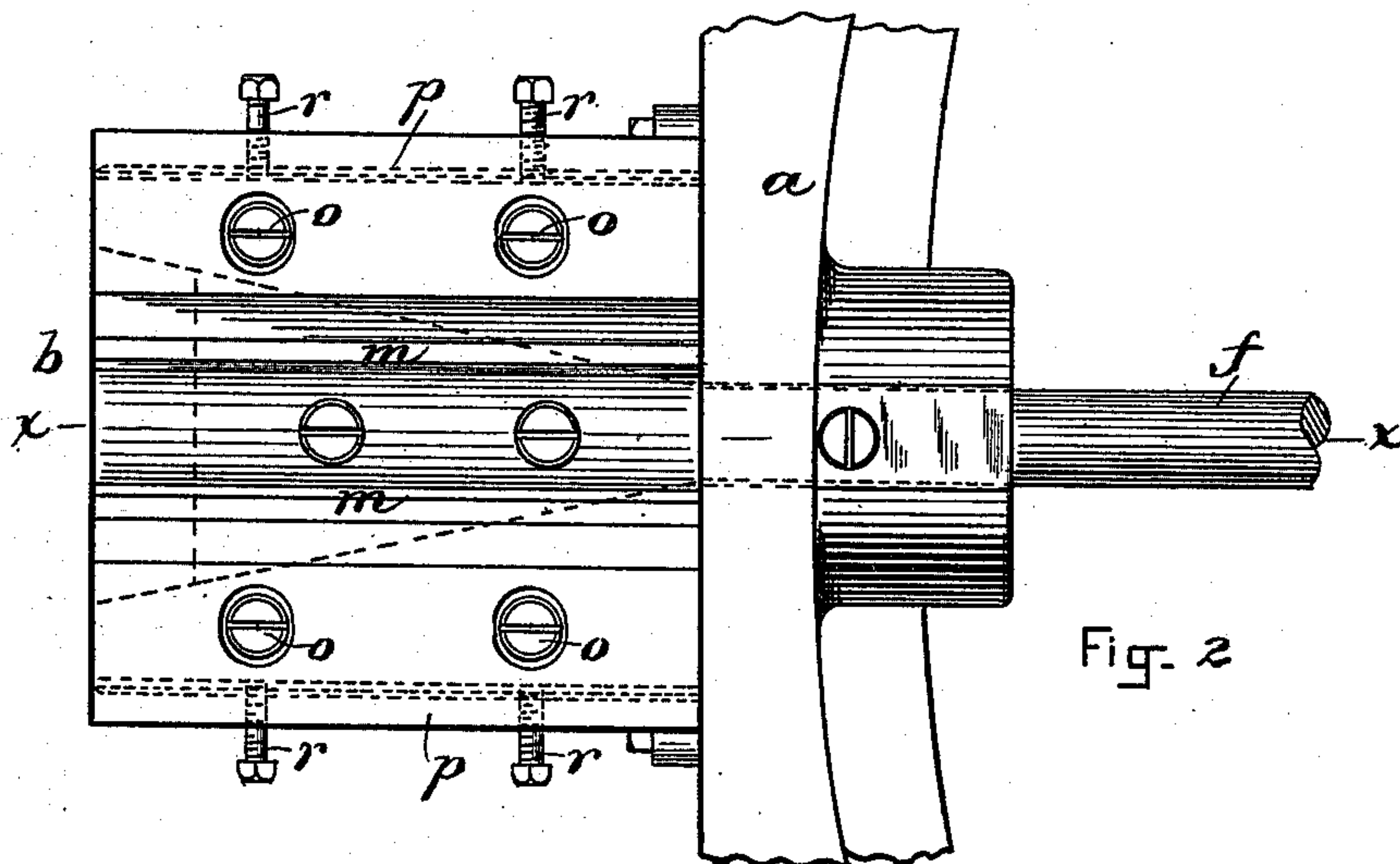


Fig. 2.

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A. D. Harrison.
W. B. Ramsay.

INVENTOR:
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by Knight Brown Crossley
Atty.

(No Model.)

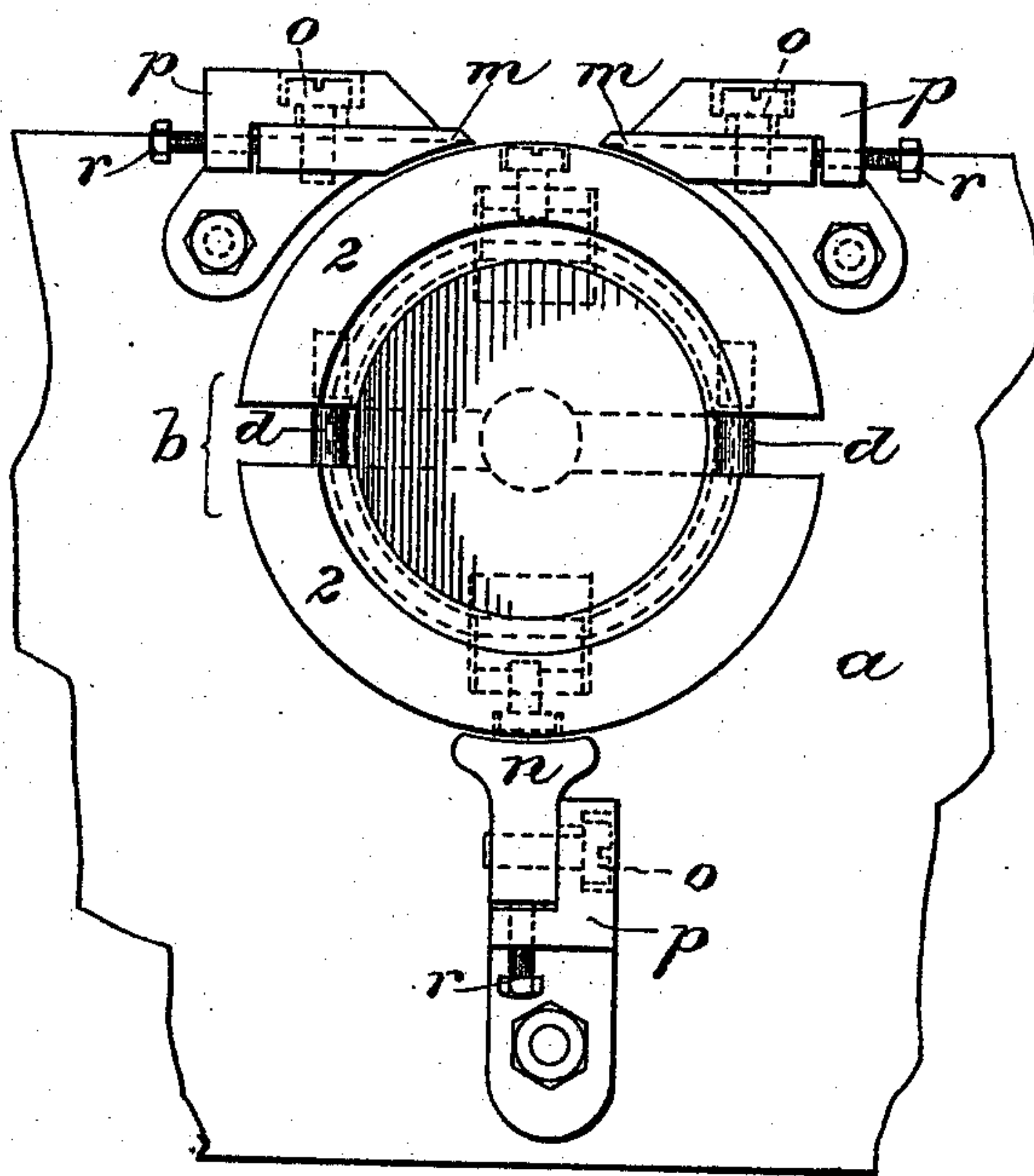
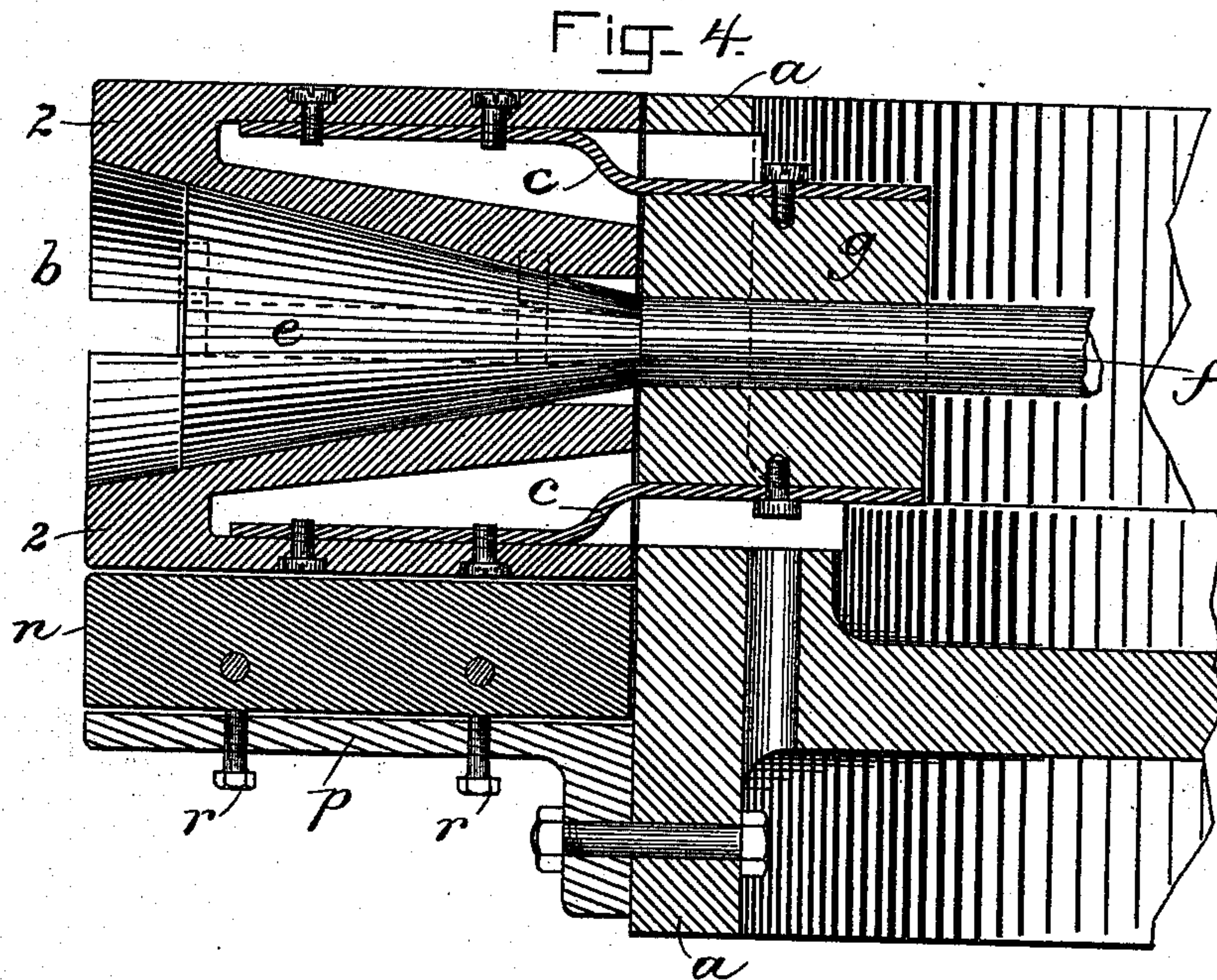
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Fig. 3

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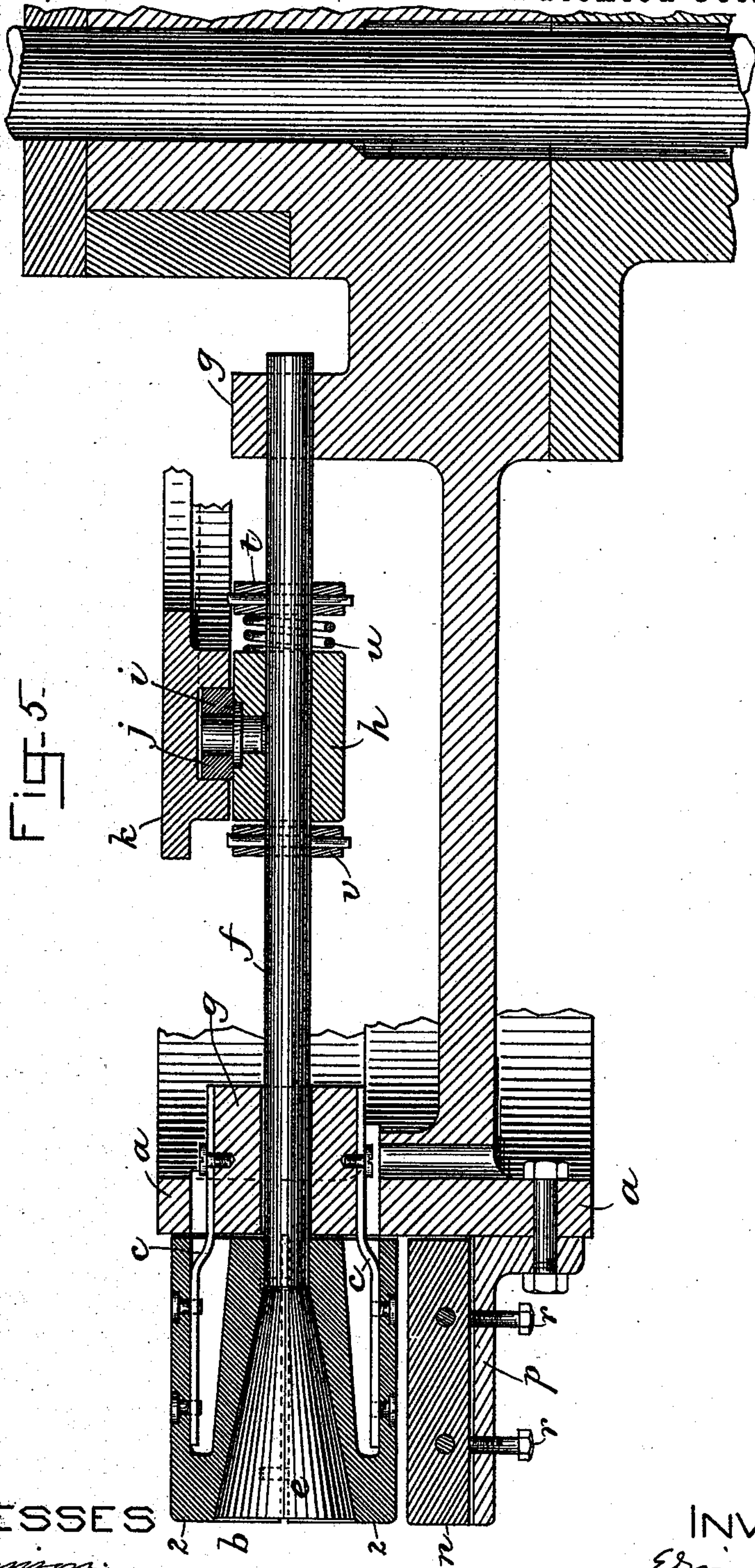
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WITNESSES

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UNITED STATES PATENT OFFICE.

EDWIN E. ANGELL, OF BOSTON, ASSIGNOR OF ONE-HALF TO E. B. WELCH, OF CAMBRIDGE, MASSACHUSETTS.

MANDREL FOR CAN-MACHINES.

SPECIFICATION forming part of Letters Patent, No. 412,581, dated October 8, 1889.

Application filed January 29, 1889. Serial No. 298,007. (No model.)

To all whom it may concern:

Be it known that I, EDWIN E. ANGELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Mandrels for Can-Machines, of which the following is a specification.

This invention relates to can-machines employing a series of mandrels arranged on a carrier to which a progressive step-by-step motion is imparted. Scroll-shaped can-body blanks of sheet metal are placed on said mandrels, and while held thereon are subjected to the action of devices which solder the seams formed by the overlapping edges of the blanks.

My invention has especial reference to the construction of said mandrels; and it has for its object to provide improved means for expanding the mandrel within the blank, and external devices co-operating with the expanded mandrel in clamping the blank and holding it firmly during the soldering operation.

The invention consists in the several improvements, which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of my improved mandrel and a sectional view of a portion of the supporting-carrier. Fig. 2 represents a top view of the same. Fig. 3 represents an end view. Fig. 4 represents a section on line *x x*, Fig. 2. Fig. 5 represents a section on the same line, but showing more of the machine than Fig. 4.

The same letters and figures of reference indicate the same parts in all the figures.

In the drawings, *a* represents a supporting-carrier, which is of circular form and carries a series of mandrels *b*, said mandrels being arranged radially with relation to the center of the carrier, the latter being capable of rotating, and thus moving the mandrels progressively in a circular path.

The organized machine, of which the carrier and mandrels form parts, is fully shown and described in another application for Letters Patent filed by me coincidentally herewith, Serial No. 298,008, to which reference may be had.

Each mandrel is composed of two longitudinal sections 2 2, which are separable from each other and are secured to the outer ends of springs *c c*, the inner ends of which are secured to the carrier. Said springs permit the sections of the mandrel to be separated for the purpose of expanding the mandrel, as hereinafter described. One of the sections is provided with dowels *d d*, which project into holes in the other section. Said dowels guide the sections in their expanding and contracting movements and keep said sections parallel with each other.

The mandrel-sections have tapered recesses or cavities in their inner sides, in which is fitted a frusto-conical wedge *e*, which is formed on the end of a rod *f*, the latter being fitted to slide lengthwise in guides *g g*, affixed to or formed on the carrier. On said rod is a sleeve *h*, which is engaged with the rod, so as to impart longitudinal motion thereto, as hereinafter described, and is provided with a trundle-roll *i*, projecting into the groove *j* of a fixed cam *k*, (see Fig. 5,) which is rigidly attached to the supporting-frame of the machine and remains stationary while the carrier rotates, as described in my other application above referred to, said fixed cam being formed to give the rod *f* and wedge *e* an inward longitudinal movement when the rotation of the carrier brings the rod, wedge, and mandrel to a given point, thereby expanding the mandrel. When the mandrel reaches another given point, the cam moves the rod and wedge outwardly and releases the mandrel-sections, the cam being formed to hold the mandrel expanded while the soldering devices are acting on the cam-blank thereon, as described in said application.

The mandrel-sections 2 are recessed or formed hollow for the reception of the springs *c*, the latter being thus housed within said sections and protected by the inner walls thereof from any possible contact with the expanding wedge or cone. Said springs also have extended connections with said sections by being attached at separated points by the securing-screws, and thus they are adapted to hold the mandrel-sections parallel as they are moved outward and inward.

m m and *n* represent jaws, which are sup-

ported by the carrier *a*, and stand parallel with the mandrel, the jaw *n* being at the under side and the jaws *m m* at the upper side of the mandrel. Said jaws are arranged
 5 so that when the mandrel is expanded the can-body thereon will be clamped between the mandrel-sections and the jaws, the jaws *m m* being arranged to clamp and hold the can-body at opposite sides of the
 10 seam formed by the overlapping edges of the can-body, while the lower jaw *n* holds the opposite side of the can-body. The said jaws are adjustably secured by screws *o* to brackets or holders *p*, attached to the carrier *a*,
 15 said brackets having slots through which said screws pass, and adjusting or bearing screws *r*, arranged to support the jaws at the desired distance from the periphery of the mandrel.

20 I prefer to arrange the jaws *m m* tangentially, as shown in Fig. 3, as by said arrangement the space over the mandrel is less obstructed than it would be if said jaws were arranged radially like the jaw *n*.

25 The operation is as follows: The can-blank (previously formed into a scroll with overlapping edges) being placed upon a mandrel *b* with its overlapping edges between the jaws *m m*, the mandrel is expanded by the
 30 means above described, the can-body being thus clamped between the mandrel-sections and the jaws until after the soldering operation has been effected, when the mandrel-sections are released to permit the removal
 35 of the soldered can-body.

In order that variations in the thickness of the sheet metal of the can-bodies may be automatically compensated for, I fit the
 40 sleeve *h*, Fig. 5, loosely on the rod *f*, so that it can slide independently on said rod, and I interpose between said sleeve and a collar *t*, attached to the rod *f*, a spring *u*, which transmits to the rod *f* and wedge *e* the inward
 45 endwise motion given to the sleeve *h* by the cam *k*, said spring enabling the rod and wedge to stop before the completion of the inward endwise motion of the sleeve *h*. Danger of injury to any of the parts in case the mandrel is expanded as far as the thick-

ness of the sheet metal will permit before the
 inward movement of the sleeve *h* is completed is thus avoided. The rod *f* has another collar *v*, against which the sleeve *h* acts to move the rod *f* outwardly.

I claim—

1. The combination, with the supporting-carrier *a*, of the mandrel-sections 2, recessed or formed hollow between their inner and outer walls to provide housing-cavities, the
 55 springs *c*, attached to said carrier and to the said sections in the housing recesses or cavities of the latter, separated clamping-jaws outside of said mandrel-sections, and means
 60 for expanding the mandrel to clamp a can-body between said mandrel and jaws, substantially as set forth.

2. The combination, with the expansible mandrel, of the external jaws and means for
 65 adjusting said jaws with relation to the periphery of the mandrel, and for positively holding them at any position to which they may be adjusted.

3. The combination, with the expansible mandrel, of the tangentially-adjustable jaws
 70 *m m*, as set forth.

4. The combination, with the expansible mandrel, of the adjustable jaws *m m*, arranged to co-operate with one side of the
 75 mandrel, and the jaw *n*, arranged to co-operate with the opposite side thereof, as set forth.

5. The combination of the sectional mandrel, the external jaws, the wedge interposed
 80 between the sections of the mandrel as a means for expanding the same against the jaws, a rod attached to said wedge, a sleeve *h* on said rod, a cam adapted to positively reciprocate said sleeve, and a yielding connection between said sleeve and rod, as set forth.

In testimony whereof I have signed my
 85 name to this specification, in the presence of two subscribing witnesses, this 14th day of January, A. D. 1889.

EDWIN E. ANGELL.

Witnesses:

C. F. BROWN,
 A. D. HARRISON.