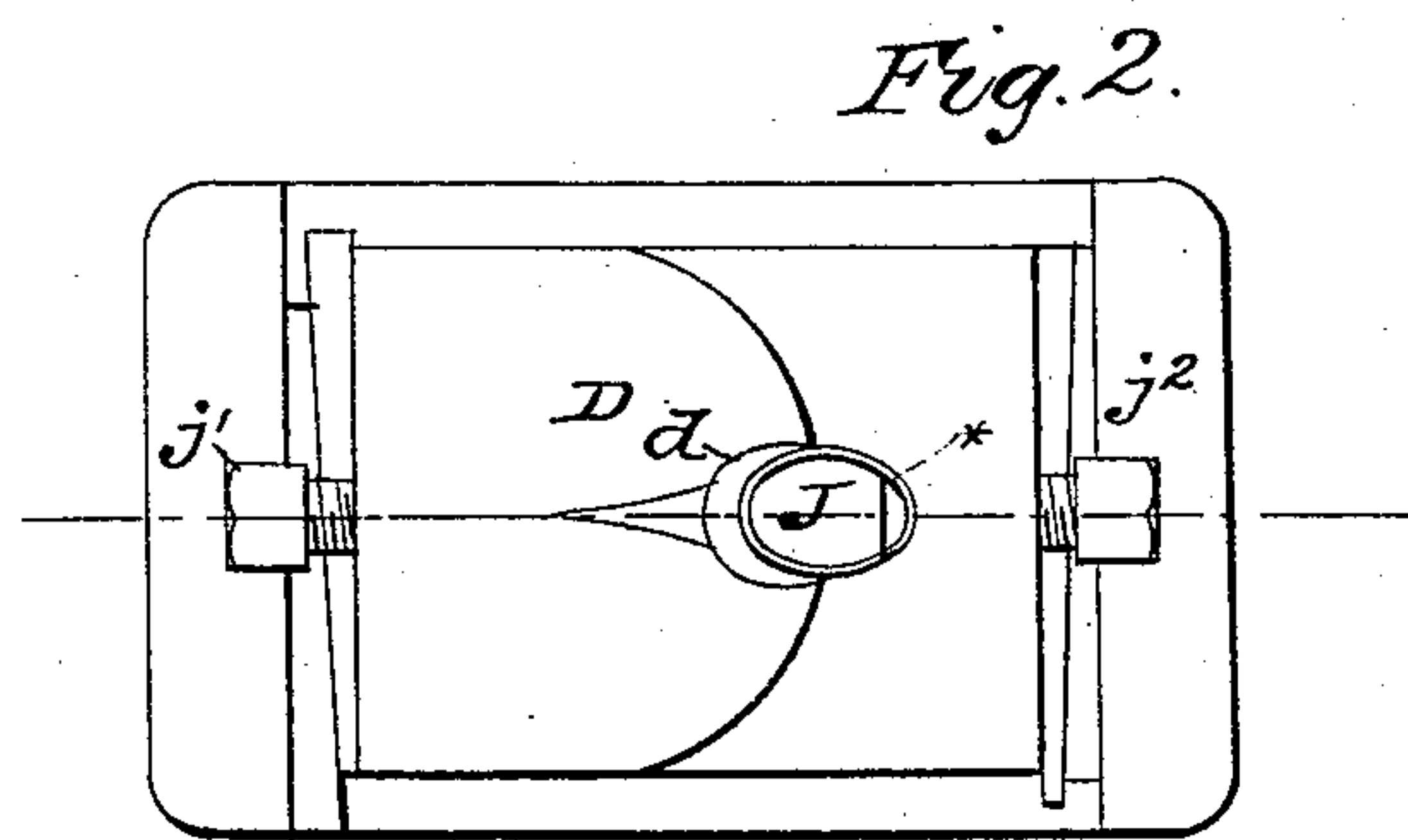
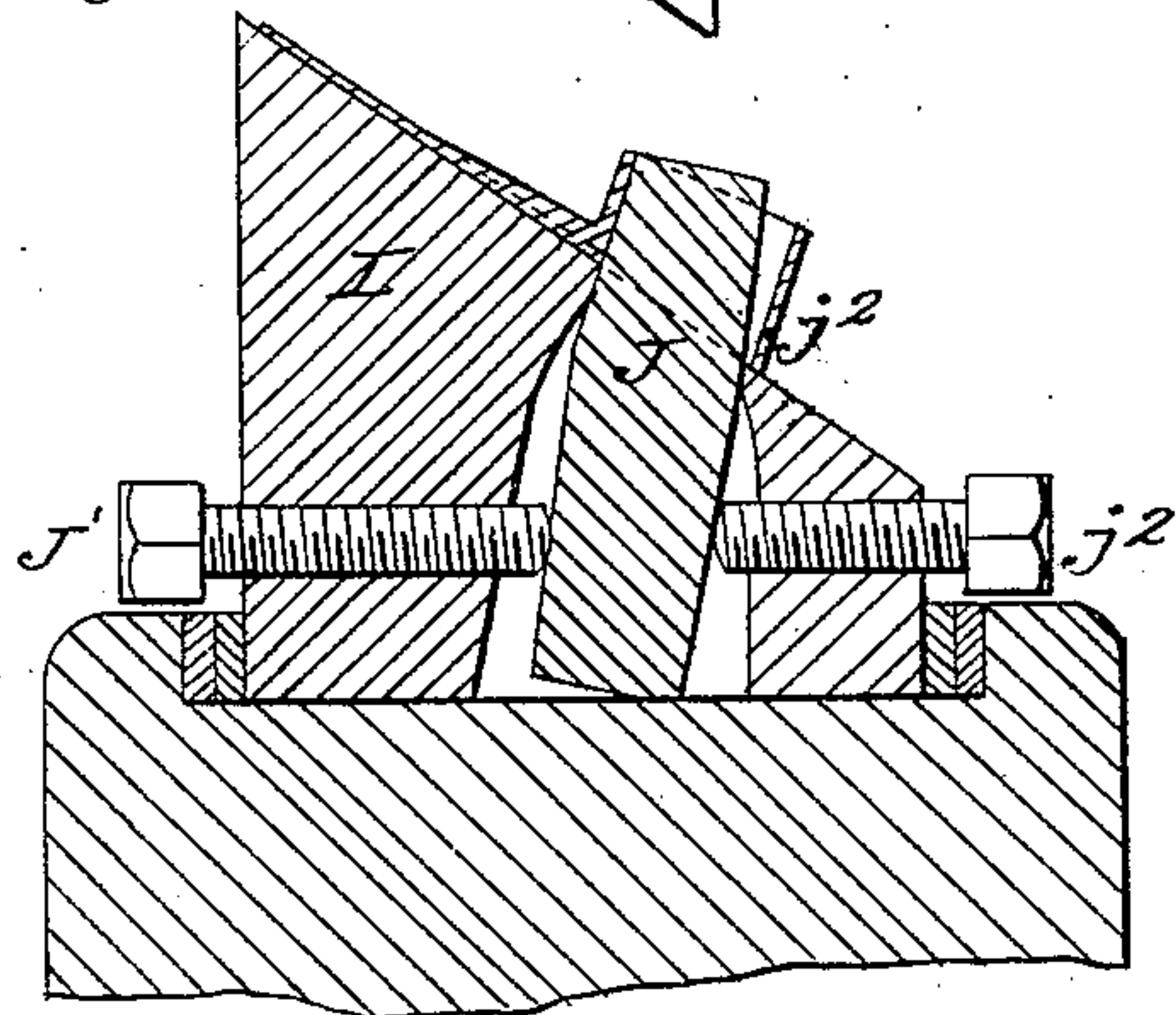
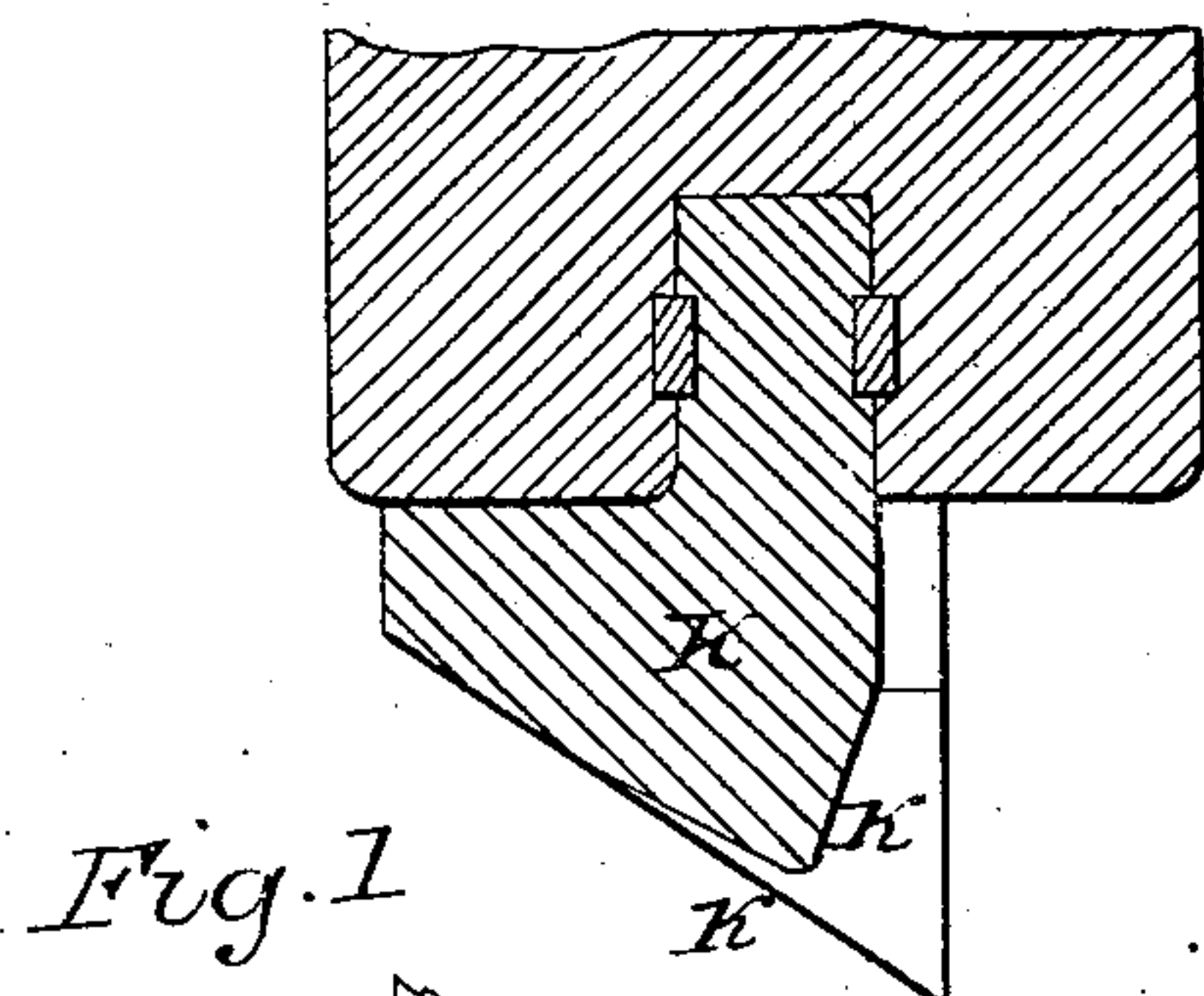


CLEMENT & FOSTER.

Manufacturing Hoes.

No. 68,414.

Patented Sept. 3, 1867.



Witnesses  
A. Perry Peck  
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# UNITED STATES PATENT OFFICE.

WILLIAM T. CLEMENT AND EDWARD V. FOSTER, OF NORTHAMPTON, MASS.

## IMPROVEMENT IN MACHINERY FOR MANUFACTURING HOES.

Specification forming part of Letters Patent No. 68,414, dated September 3, 1867.

*To all whom it may concern:*

Be it known that we, WILLIAM T. CLEMENT and EDWARD V. FOSTER, both of Northampton, in the county of Hampshire, in the State of Massachusetts, have invented certain new and useful Improvements in Machines for the Manufacture of Hoes; and we do hereby declare that the following is a full and exact description thereof.

The hoes to which our invention relates are of the character generally known in the trade as planters' hoes.

The object of our invention is to perfect the final shape of the hoe, particularly about the eye. As these hoes have been heretofore produced by hand they have been liable to be irregular in form, and to differ each from the other to such an extent as to vary the "hang" of the hoe, and seriously impair the value of the manufacture. Machinery has been introduced with some success; but the machines previous to ours have been open to serious objections, among which are the slowness with which the operations of finally shaping are conducted, and the liability of the eye to contract upon the pin or part which forms the interior of the eye by its cooling, so as to involve difficulty in its removal.

Our invention provides for perfecting the shape of the hoe by one rapid blow of a heavy drop. The blow may be repeated if necessary in any case; but its action is powerful, and it perfects the form of the throat or under side of the eye very effectively without the tendency to thin the hoe at that part, or to cause the hoe to cling destructively to the shaping parts, which is due to mechanism generally used. We prefer add adjusting means, whereby any required variation in the set of the eye, or in the hang of the hoe, may be obtained, while all the hoes made after the parts are adjusted will be exactly alike.

We will first describe what we consider the best mode of carrying out our invention, and will afterward indicate specifically the points claimed as new.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation of the anvil or stationary die, upon which the hoe is laid to receive the blow, with the drop in the act of descending upon it. Fig. 2 is a plan view of

the anvil. Both drawings show in red the material of a hoe, which has been previously formed by other means into very nearly the correct form.

Similar letters of reference indicate like parts in both the figures.

I is a substantial block of iron, which may be plated on its upper inclined surface with steel in the manner of an anvil, and may be supported firmly on any proper mass to afford the requisite stability. J is a pin, which is mounted in the anvil I, and projects above its upper surface in the manner indicated. Its lower end is held in position by the aid of two set-screws,  $j^1 j^2$ , and the hole in the anvil I, in which the pin J stands is enlarged from the top downward, so as to allow the pin to be varied in its inclination by adjusting the set-screws  $j^1 j^2$  within moderate limits. K represents a drop, which is accurately guided in vertical ways, and may be elevated and released by any approved mechanism. The guiding and operating means may be of any approved character, not necessary to be represented. The back side of the pin J, the side toward the right hand in the figure, is flattened, as represented by \*—that is to say, the pin J serves to shape very exactly the interior of the eye of the hoe, except on the flat side. It is there intentionally left flat, so as to leave a space to allow for the shrinkage of the metal, due to its cooling while on the pin.

It will be understood that the back or top of the eye (the side which is presented toward the right in these figures) should be formed with sufficient accuracy by other means before the hoe is placed on the pin B.

The drop K is recessed, as indicated by  $k$ , so as to fit around and apply properly to about one-half of the circumference of the eye, and is grooved nearly across its face, as indicated by  $k'$ , to allow for the ridge, which is necessary to extend from the eye down on the blade of the hoe to strengthen it and support the thin metal. Care must be taken in the manufacture of all these parts to give exactly the right form to each, so that the powerful blow of the drop, which may be a mass weighing, say one hundred pounds, and falling several feet, may shape the hoe with mathematical accuracy to the form desired.

In the operation of our invention the blade



having been previously extended and the eye roughly formed by hand or by other machinery, the back side of the eye is very smoothly and accurately worked to the form desired by hammers or other means not represented. The drop *k* is next elevated, and held suspended while the hoe is taken from the furnace at a bright heat, and placed on the anvil *I* and pin *J*, in the position represented. The drop *K k k'* is then released and falls. The momentum of the falling mass is expended in exactly shaping and finishing the entire surfaces of the hoe except the back, which has been previously finished. The drop may be now elevated, and the finished hoe may then be removed with tongs or otherwise, taking care not to distort the form by lifting it.

In consequence of the very brief period in which the operation may be conducted, the contraction of the eye due to loss of heat will be very slight, and the flattened portion \* of the pin *J* will allow for a very considerable contraction of the metal before the eye will cling upon the pin *J*, so as to offer any serious obstacle to its removal.

We have in experimenting with the invention in our shop for several months deemed it so important to secure perfect stability for our pin *J* that we have preferred to bed the pin firmly in a tapering hole in the anvil *I*, which corresponds exactly in form therewith. This gives no power of setting the pin at different angles, but is otherwise very satisfactory in practice. We believe that a very considerable portion of the benefits of our invention

may be obtained by working with the pin thus immovably set; but it is desirable in many cases to be able to change the angle at which the pin is set, and we prefer to do so wherever the severity of the strain on the parts is not too great. We do not confine ourselves to the adjusting by the means of set-screws precisely as represented. We can employ keys or other convenient mechanical substitutes, so as to hold the pin with the greatest firmness, and to adjust it with the greatest nicety and ease.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is as follows:

1. The within-described bed for the drop *K*, composed of the anvil *I* and pin *J*, the latter being full on the side toward the throat or edge of the hoe, and contracted on the opposite side, and arranged relatively to the drop *K k k'*, so as to act on the material *D d* of a hoe, substantially in the manner and for the purpose herein set forth.

2. In connection with the above, making the inclination of the pin *J* adjustable by means of the screws *j<sup>1</sup> j<sup>2</sup>* or their equivalents, so as to vary the inclination of the eye of the hoe at will within moderate limits, substantially as herein specified.

WM. T. CLEMENT.  
EDWARD V. FOSTER.

Witnesses:

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