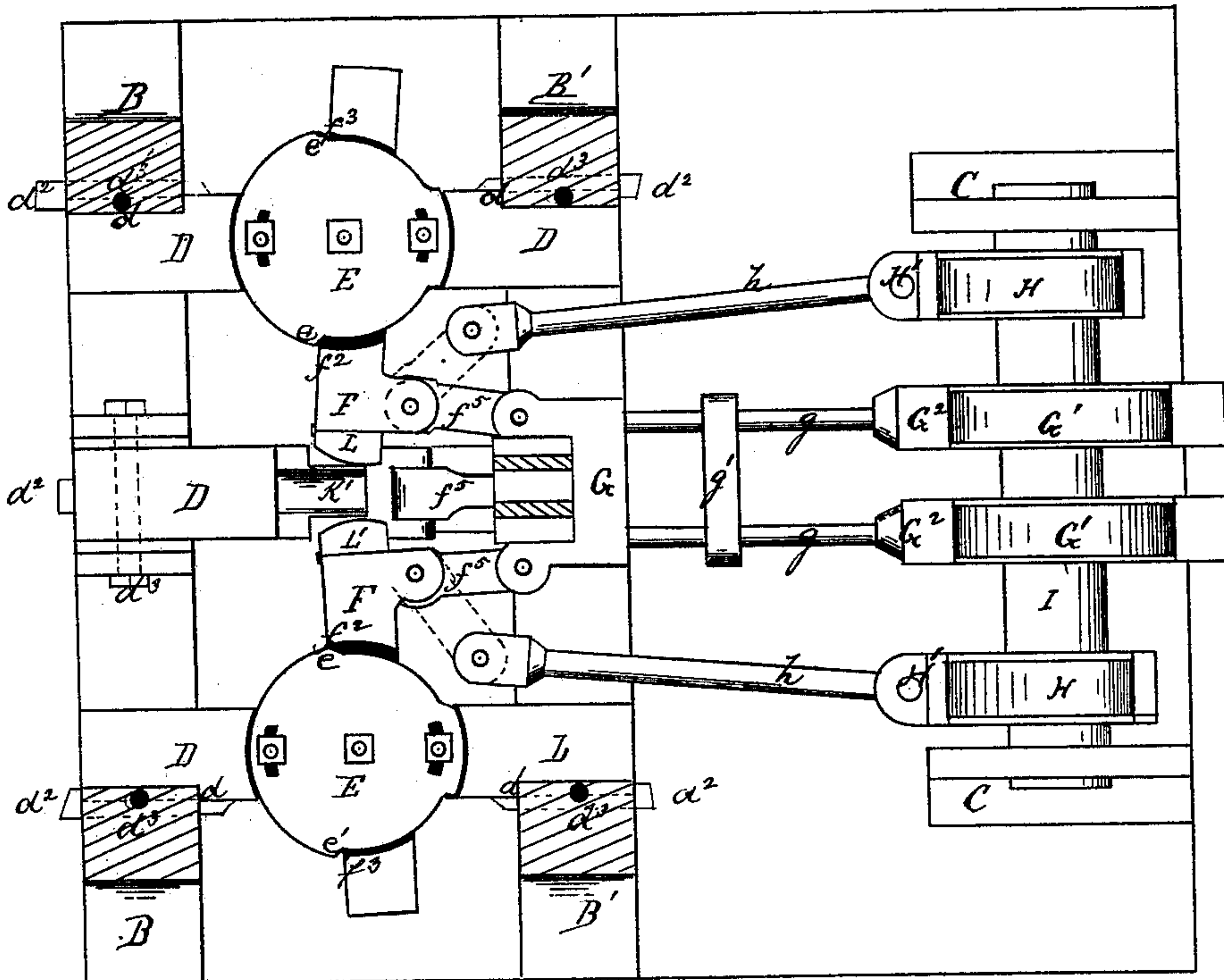
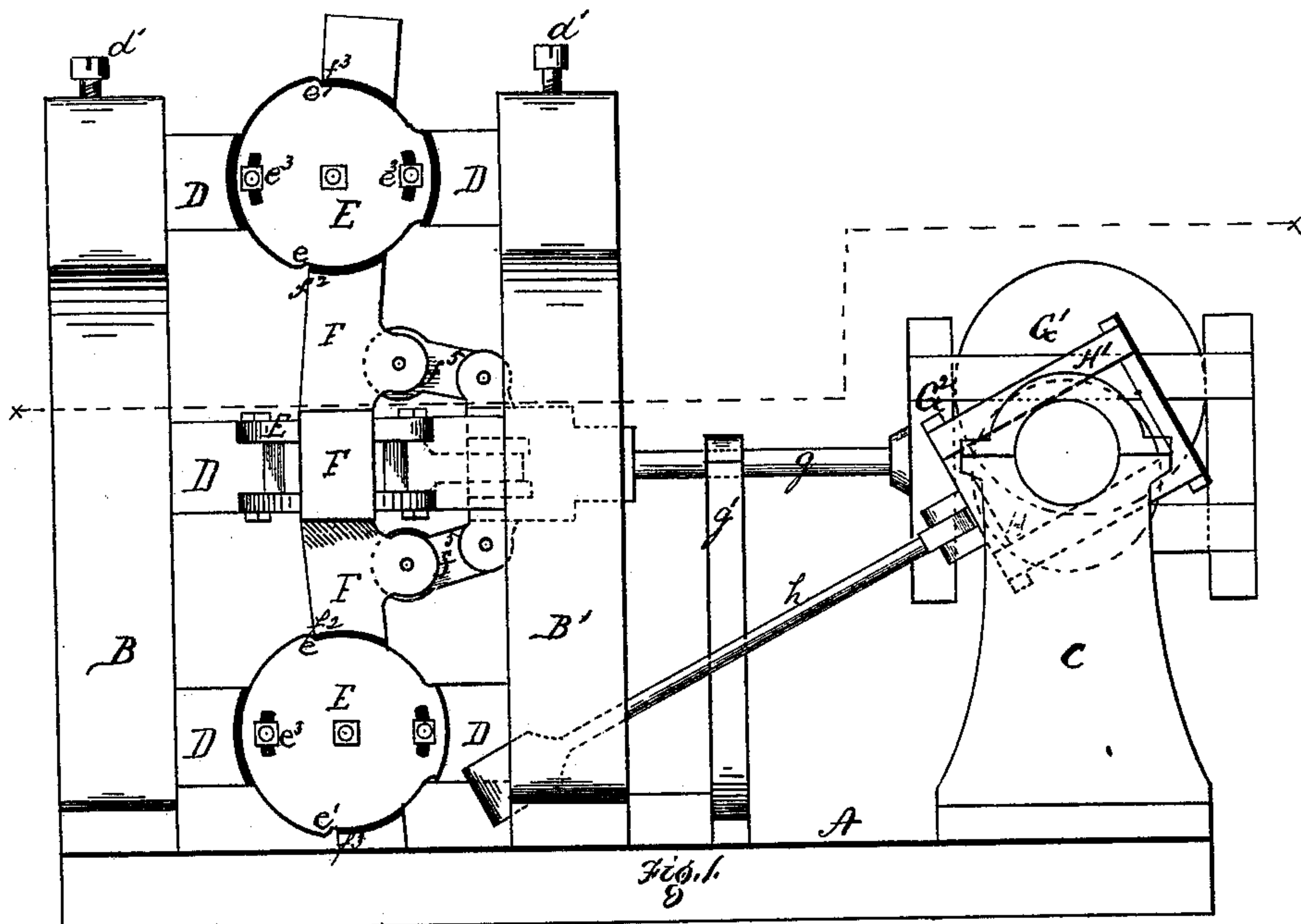


A. C. JORDAN & C. KONOLD.

MACHINE FOR FORMING THE EYES OF PICKS.

Patented March 20, 1877.

No. 188,643.



Witnesses.
J. K. Smith
R. C. Wrenshaw

Fig. 2.
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August C. Jordan
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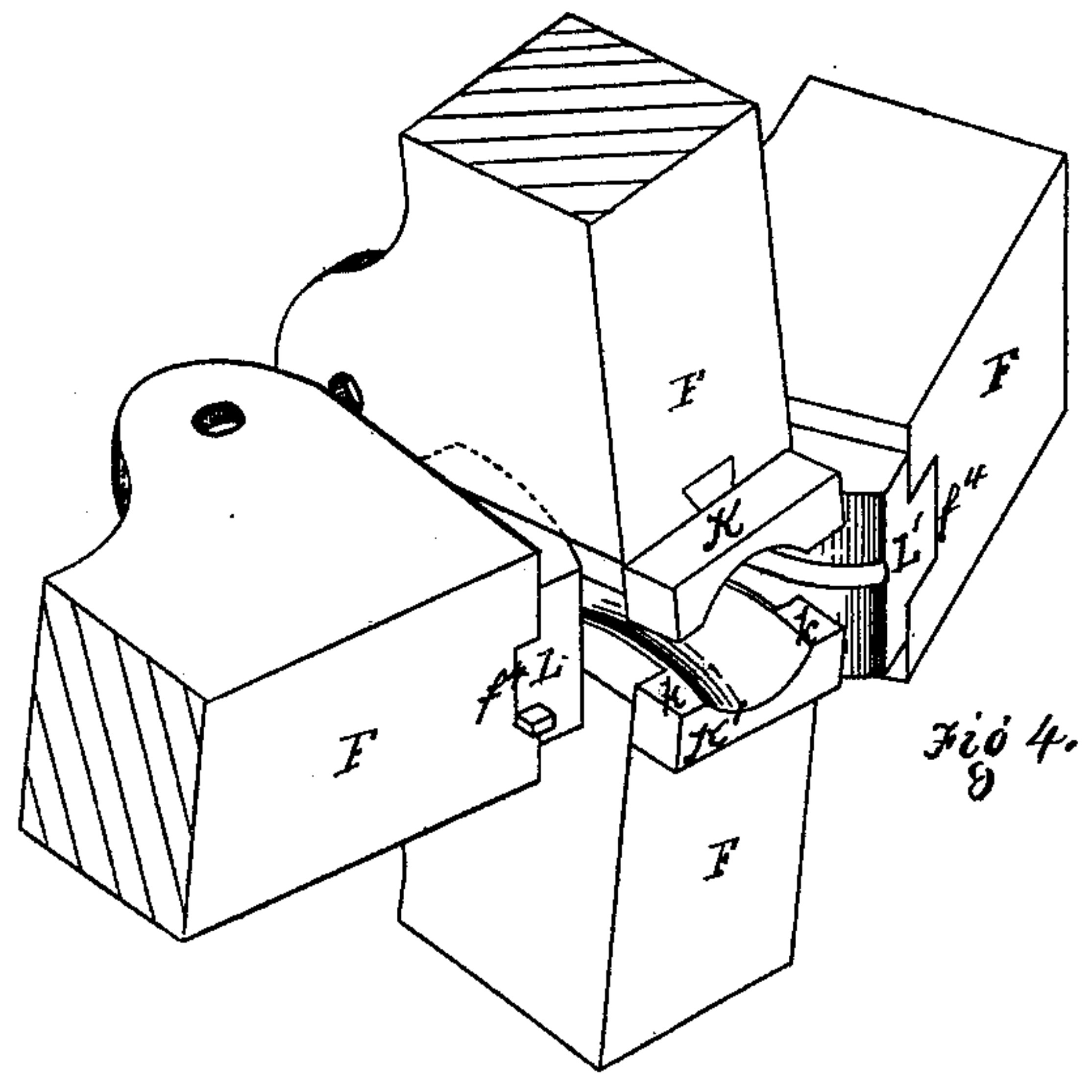


Fig. 4.

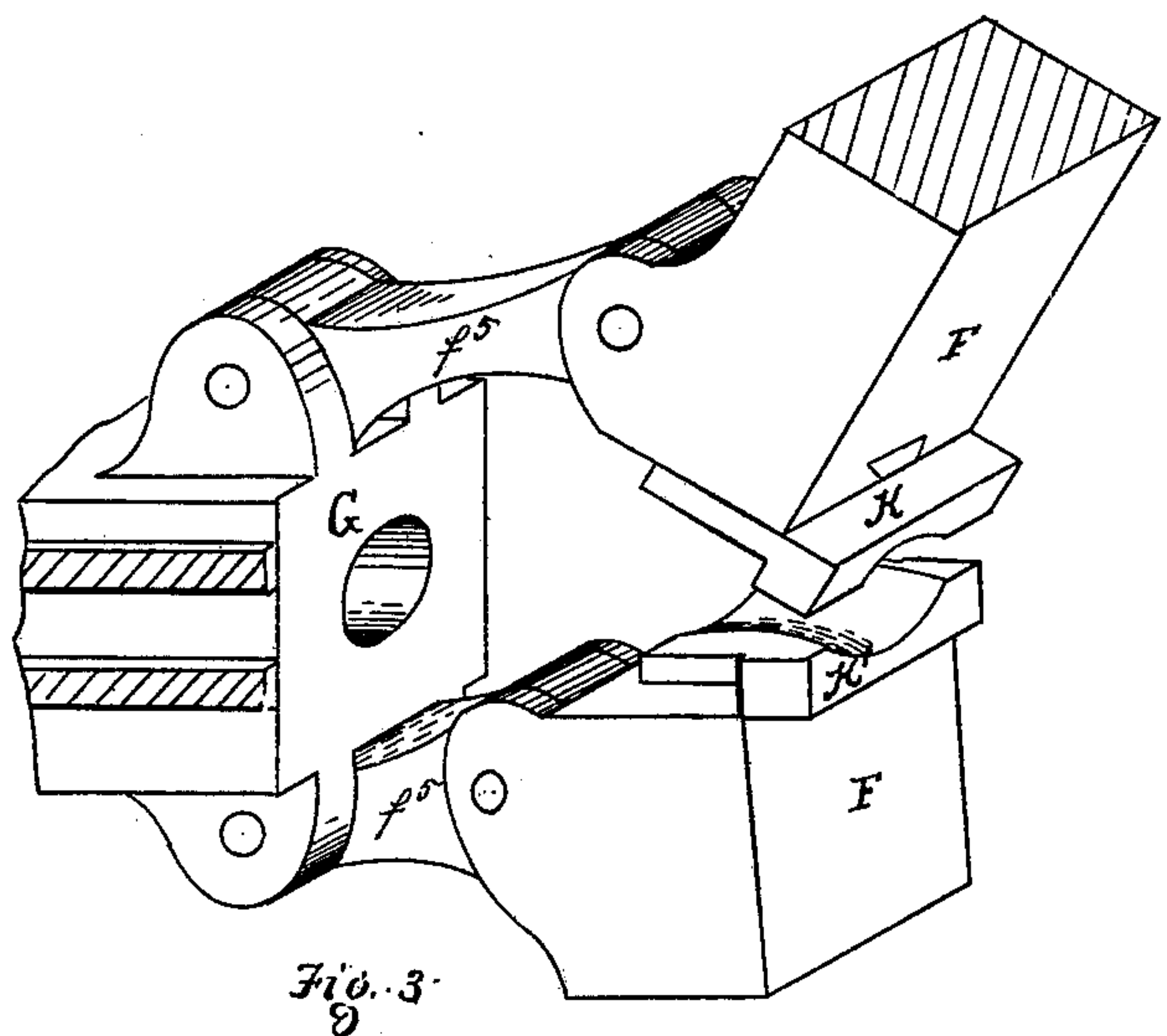


Fig. 3.

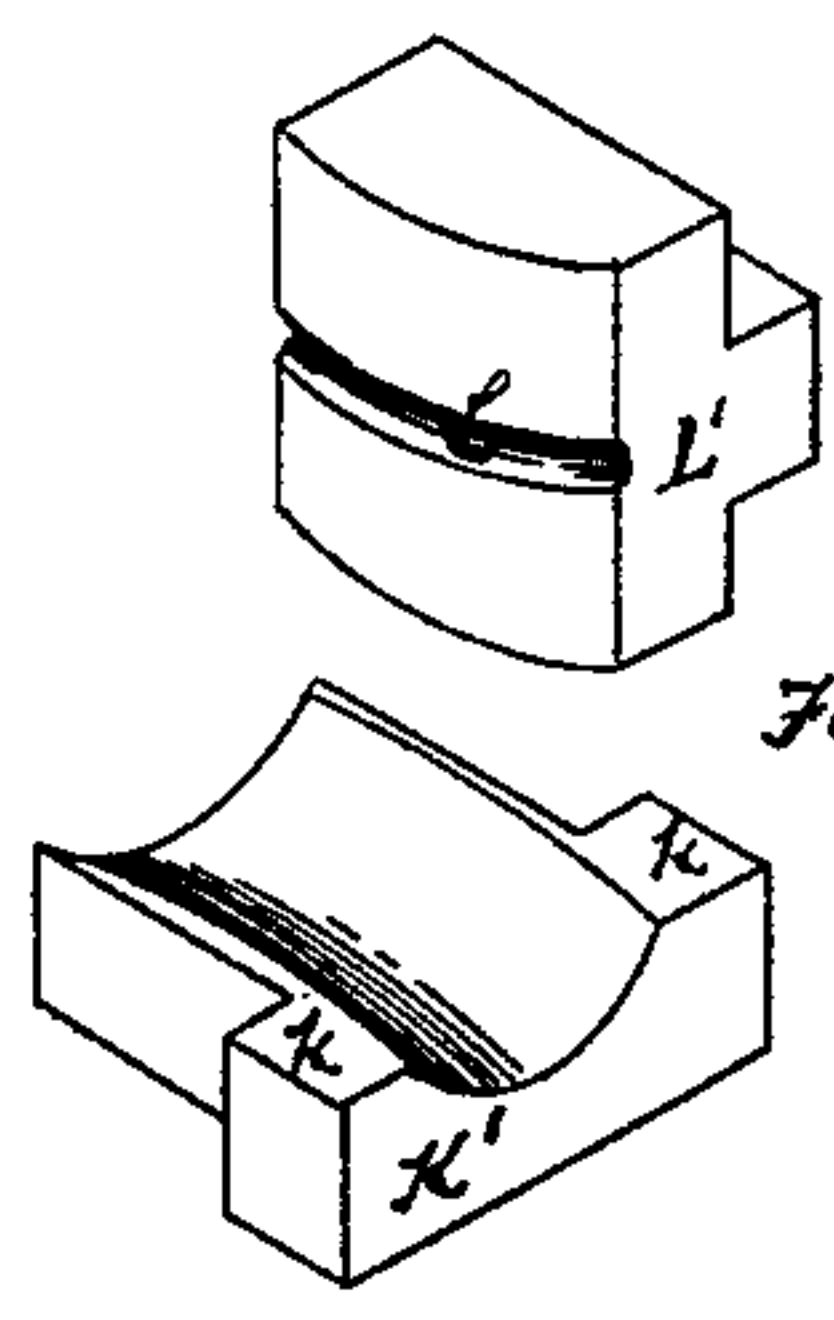


Fig. 6.

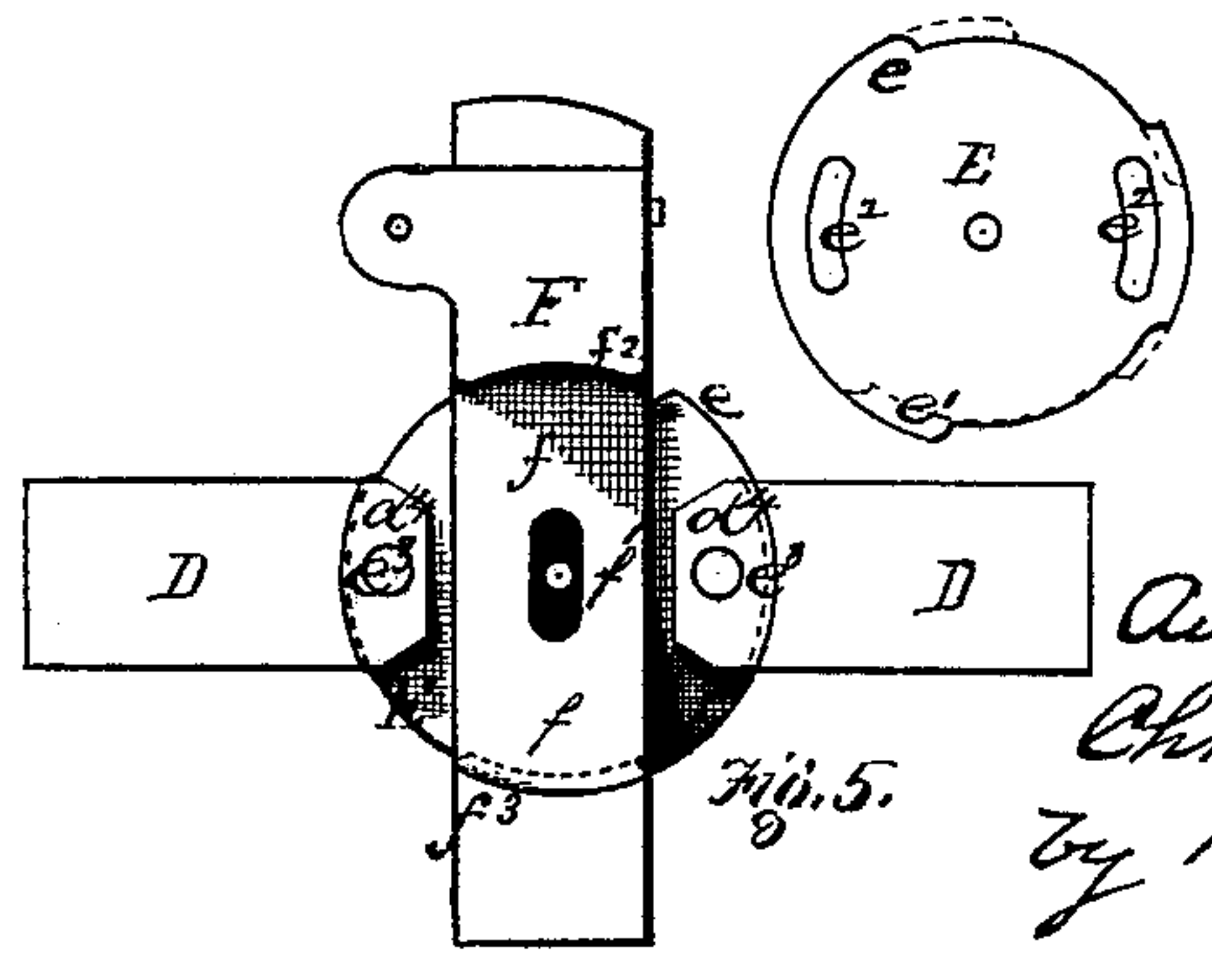


Fig. 5.

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UNITED STATES PATENT OFFICE.

AUGUST C. JORDAN, OF PITTSBURG, AND CHRISTIAN KONOLD, OF EVERGREEN HAMLET, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR FORMING THE EYES OF PICKS.

Specification forming part of Letters Patent No. 188,643, dated March 20, 1877; application filed March 1, 1877.

To all whom it may concern:

Be it known that we, AUGUST C. JORDAN, of Pittsburg, and CHRISTIAN KONOLD, of Evergreen Hamlet, both in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Metal-Working Machine; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side elevation of a machine embodying our invention. Fig. 2 is a horizontal section on the line $x x$, Fig. 1, the dotted lines indicating the manner of driving when the vertical and horizontal die-carriers are required to move in reverse direction. Fig. 3 is a perspective view of two of the die-carriers and dies in the first position, or at the time the metal is introduced. Fig. 4 is a similar view of four of the dies and carriers in the second position, or when they have finished their stroke. Fig. 5 is a detached view of one of the die-carriers or arms and its blocks and cams, the upper cam having been removed to show the construction of the carrier, and Fig. 6 is a view of the dies.

Like letters refer to like parts wherever they occur.

Our invention relates to improvements in machinery employed for drawing, working, and shaping metals, as in the manufacture of wedges, bolts, and spikes, or the eyes of tools, such as axes, picks, adzes, and generally where it is desirable to draw metal, or taper and shape the same; and consists, first, in combining with the die-carrier or arm, circular or similarly shaped offset-cams, which project and withdraw the carrier or arm at intervals during its travel, so as to cause any die or dies which may be secured thereto to act with a drawing, pinching, and compressing motion on any metal within the path of the die or dies; secondly, in combining with the die-carriers or arms, circular or similarly shaped, offset adjustable cams, by means of which the die-carriers or arms of a series may

be projected and withdrawn simultaneously, or at different intervals, and at different parts of their travel, according to the shape or form to be given to the metal operated upon; thirdly, in combining with a series of die-carriers or arms, and offset-cams for varying the travel or path of the carriers, driving-gear adapted to cause one or more of the carriers or arms to move in reversed directions from the remaining carriers or arms of the series; and, finally, in details of construction, hereinafter more definitely set forth.

We will now proceed to describe our invention more specifically, so that others skilled in the art to which it appertains may apply the same.

A represents the bed, upon which are erected suitable housings B, B', and C for the bearings of the die-carriers or arms, and the power-shaft. D represents bearing-blocks let into the housings, or carried in recesses thereof, as at d , and adjustable either by set-screws d^1 (as in the upper set) or by liners, wedges, or inclines d^2 , (as in the remaining bearings,) so that the series of bearings can be moved to or from a center at pleasure. In order to properly secure the side bearings, bolts d^3 pass through the housings and through elongated slots in the blocks D. The projecting portions d^4 of bearing-blocks D are cut away to form seats for the circular cam-plates E. E E represent cam-plates, usually of circular shape, with offsets $e e^1$ so located and of such shape as will give the desired throw to the arms or die-carriers, and with slots e^2 , by means of which they are adjustably connected by bolts e^3 to the bearing-blocks D. These cam-plates support and control arms or die-carriers F, of which one or more are employed, according to the class of work to be performed by the machine. In the present instance, where the mechanism is especially arranged and provided with dies to draw out and weld up pick or adze eyes, and like articles, a series of four of these carriers and their appurtenances are grouped around a common center. The arms or carriers F are cut away at f to

play between the cam-plates E, which support them, and in which they are pivoted by pins passing through slots f^1 in the arms, the shoulders $f^2 f^3$ thus formed engaging with the offsets $e e^1$ of the circular cam-plates, so as to project and retract each arm or carrier as it reciprocates. The ends of the carriers or arms F may be recessed, as at f^4 , or otherwise constructed for the attachment of suitable dies.

Each carrier or arm is provided with a pivoted link, f^5 , by which it is connected to, and operated from, a cross-head, G, or an independent driving-rod, h , accordingly as the arms or carriers F are to move in the same or reverse directions. G is the cross-head, to which the carriers may be connected by links f^5 , said cross-head being operated by cams G^1 on the power-shaft I through a yoke or yokes, G^2 , and rod or rods g , the latter preferably supported in guides g' , which renders the motion of the cross-head steady and uniform. The coupling of the cross-head and carriers by links f^5 , indicated in full lines, Fig. 2, is that employed when the carrier-arms are to move in the same direction; but it is sometimes desirable to cause the vertical and horizontal carriers to move in reverse direction—as, for instance, in drawing or shaping reversely-tapered articles, as double wedges, for which purpose we secure to the power-shaft i cams H, whose throw is the reverse of the cams G^1 , and provide yokes H' and rods h , by which to operate the horizontal carriers independently, as indicated in dotted line, Fig. 2.

K K' L L' represent a set of dies for drawing the eyes of picks or adzes, which may be employed in connection with our machine. The operative faces of the top and bottom dies K K' are concave from side to side, and slightly convex from end to end, as shown, and are formed with offsets k , back of which the side dies L L' work. The side dies L L', which, if desired, may be slightly longer than the portion of dies K K' against and with which they work, are convex from end to end, and provided with longitudinal grooves l , corresponding to the junction of the top and bottom dies. These dies are secured to the arms or carriers F by dovetailed projections and keys, or in other suitable manner.

The operation of the above devices will now be described with reference to the formation of pick-eyes, for which purpose the dies K K' L L' are intended, and to which the whole mechanism is peculiarly well adapted.

In forming picks with high eyes it is desirable that the top and bottom dies, K K', or those which draw out the sides of the eye, should first commence to operate, so as to draw and spread the blank in such manner as to insure sufficient metal for the action of the lateral dies L L', which close, weld, and perfect the eye.

Therefore we adjust the cams or cam-plates E of the vertical carriers F so that their offsets e are more or less in advance of the same points on the cams or cam-plates of the horizontal carriers or arms. Consequently, when the projections or shoulder f^2 engages with offset e , the dies K K' will first be projected, and commence to draw, spread, and form the eye, and the instant afterward the lateral dies L L' are projected in like manner, and, entering back of the offsets k of dies K K', set up, weld, and assist in drawing out the eye. The carriers being in the position shown in Fig. 3, the pick-blank is thrust between the dies K K' until arrested by the shanks striking against the lateral carriers F. The dies K K' and L L' then operate successively, as before specified, and draw and finish the eye by the time they arrive at the position shown in Fig. 4.

Owing to the fact that the lateral carriers F are projected by the offset-cams before commencing to move in the arc of a circle, said carriers can be used as guides in inserting the blank.

On the return travel of the dies, or in changing from the position shown in Fig. 4 to that shown in Fig. 3, the projections f^3 of the carriers will ride upon offsets e^1 of the respective cam-plates E, and thus retract or withdraw the carrier F.

When it is desirable to change the thrust of the carriers the bolts e^3 , which secure the cam-plates E to the bearing-blocks D, are loosened, and the plates turned to bring the offsets $e e^1$ opposite the points where required, after which the plates E are secured as before, by tightening the nuts.

For some purposes one or more of the dies of a machine may be secured to a fixed bed or block, and a single carrier or arm, with its offset-cam and driving mechanism, may be employed, as in the manufacture of shovel-blades, fire-pokers, knives, forks, or other tapered blanks, either as a cutting or pressing die.

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

1. In a metal-working machine, the die-carrier or arm, in combination with its circular offset-cam, and with suitable driving mechanism, substantially as and for the purpose specified.

2. In a metal-working machine, the combination of two or more die-carriers with circular offset-cams adapted to project the dies, substantially in the manner and for the purpose specified.

3. In a metal-working machine, the combination of the die-carrier or arm with the adjustable offset-cam, substantially as and for the purpose specified.

4. The combination, in a metal-working ma-

chine, of a series of die-carriers and their offset-cams, with mechanism, substantially as described, adapted to cause one or more of the carriers to move in reverse direction to the rest of the series.

5. The combination of the carriers and their offset-cams, the cross-head, and the cam and yoke driving mechanism, substantially as and for the purpose specified.

6. In combination with the convex side dies, the concave top and bottom dies, hav-

ing the offsets or projections, substantially as and for the purpose specified.

In testimony whereof we, the said AUGUST C. JORDAN and CHRISTIAN KONOLD, have hereunto set our hands.

AUG. C. JORDAN.
CHRISTIAN KONOLD.

Witnesses:

JAMES I. KAY,
T. B. KERR.