

No. 621,678.

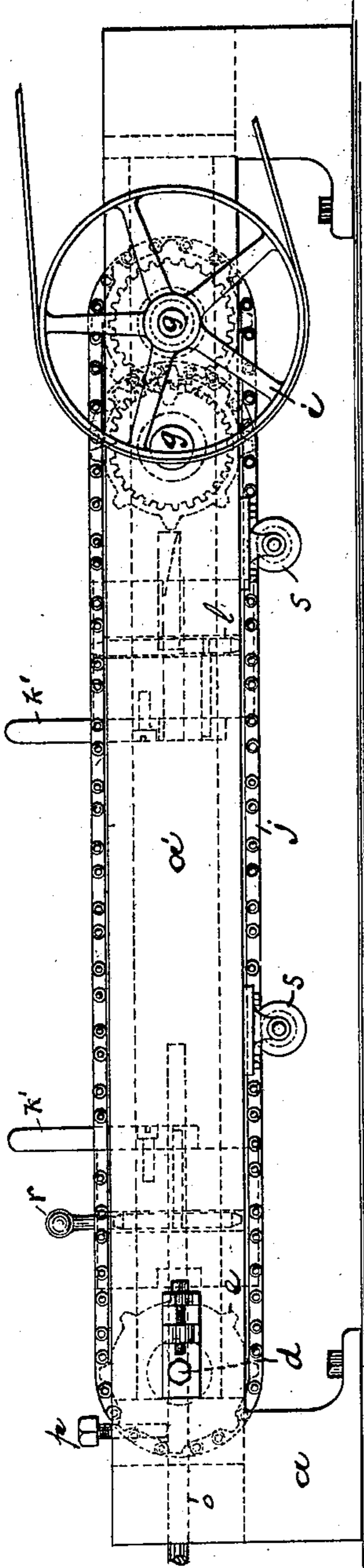
Patented Mar. 21, 1899.

J. ILLINGWORTH.
METAL DRAWING MACHINE.

(Application filed Apr. 21, 1898.)

(No Model.)

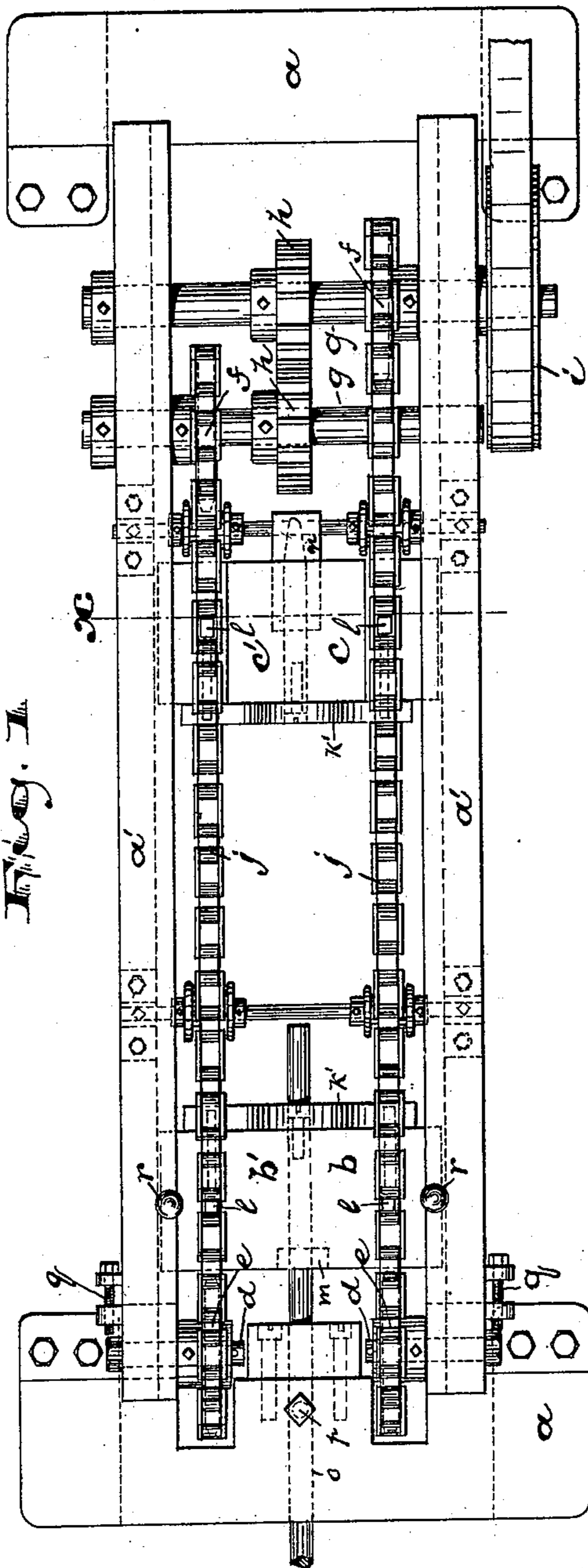
2 Sheets—Sheet 1.



WITNESSES:

A. R. Krouse.

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2 Sheets—Sheet 2.

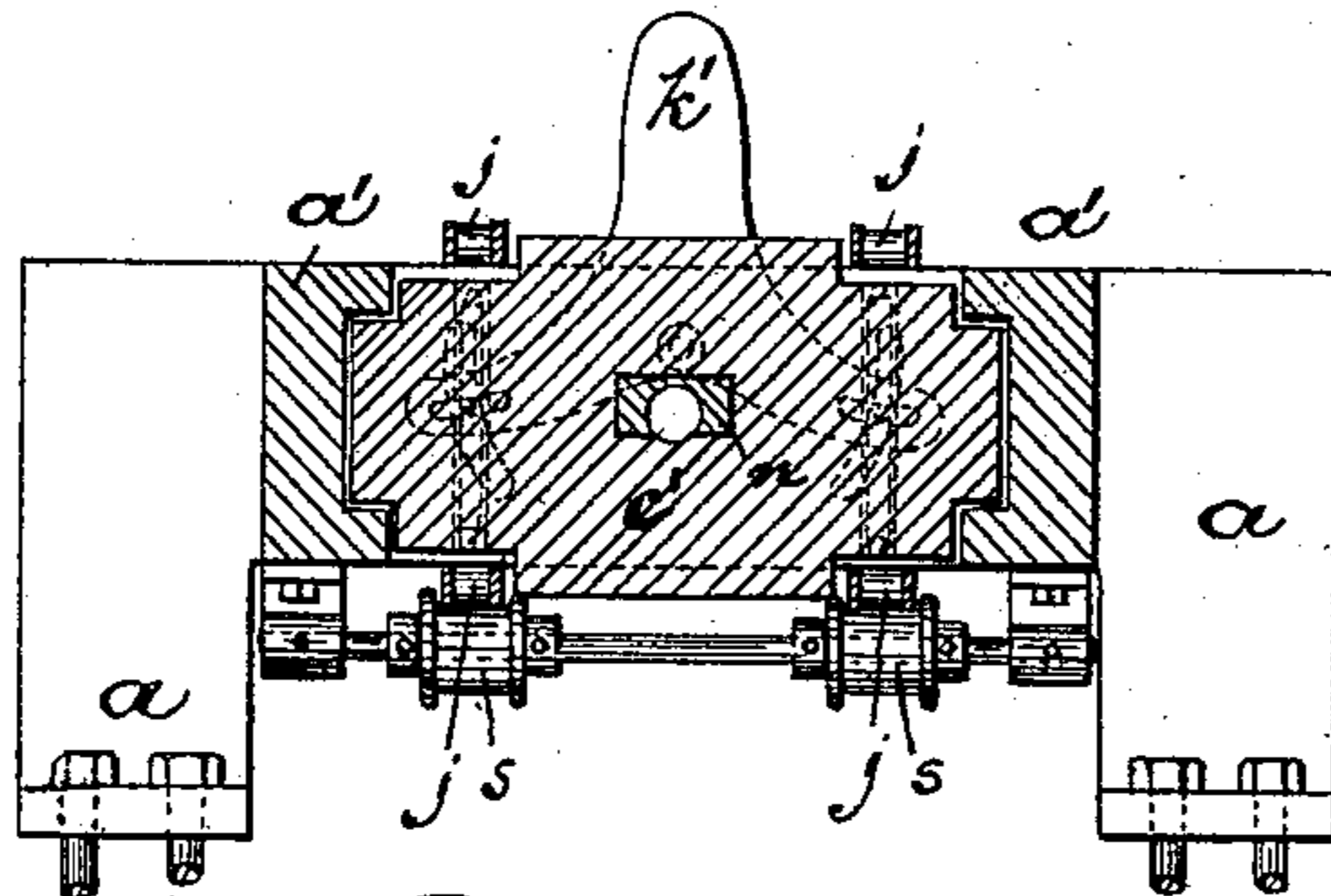


Fig. 3.

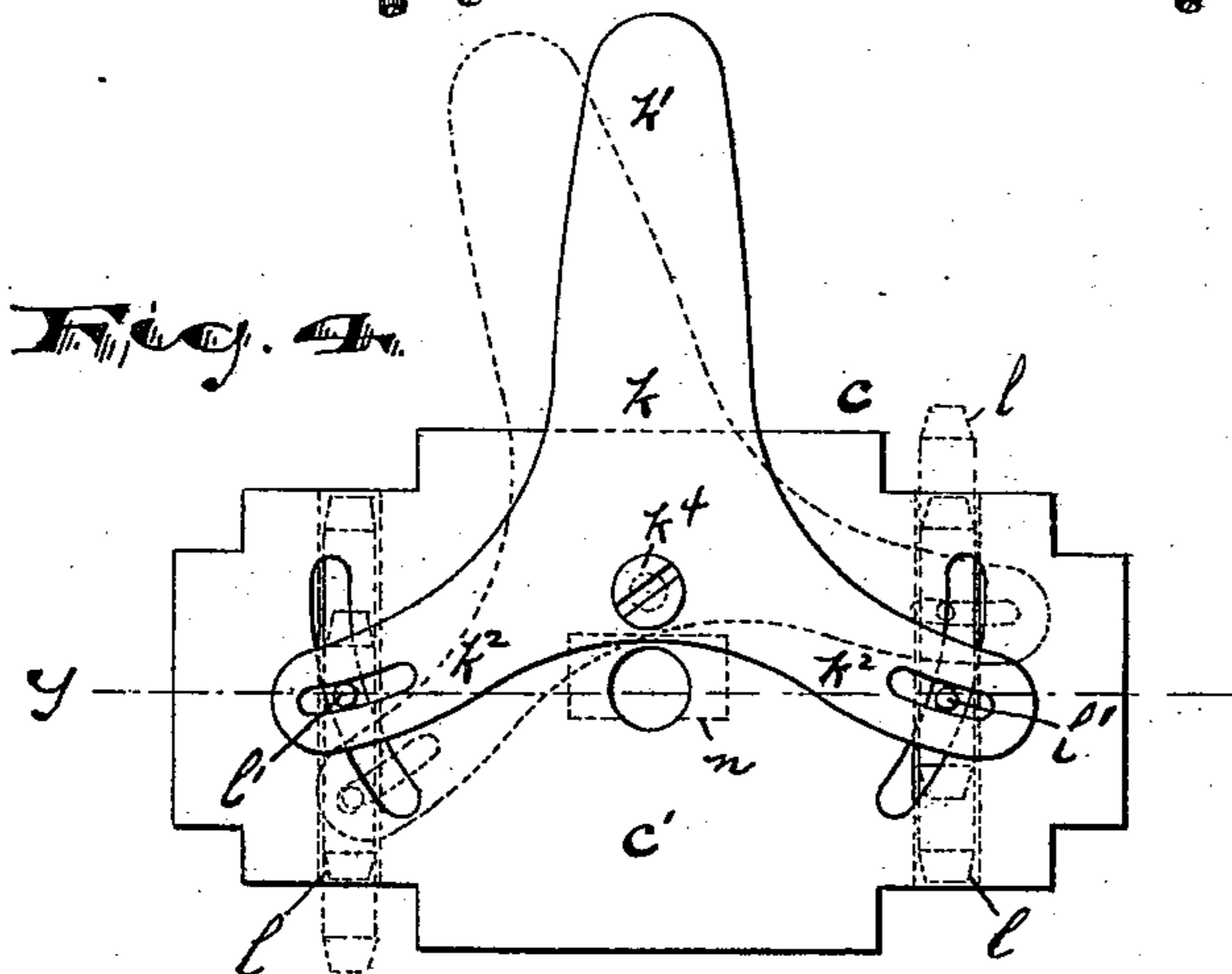


Fig. 4.

Fig. 6.

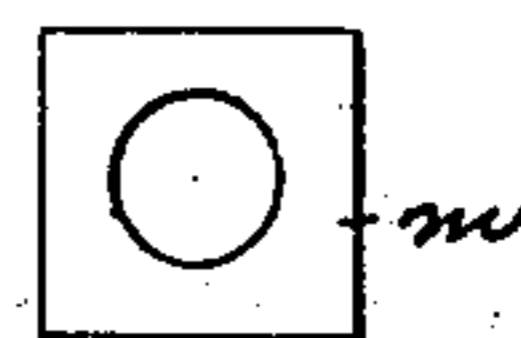


Fig. 7.

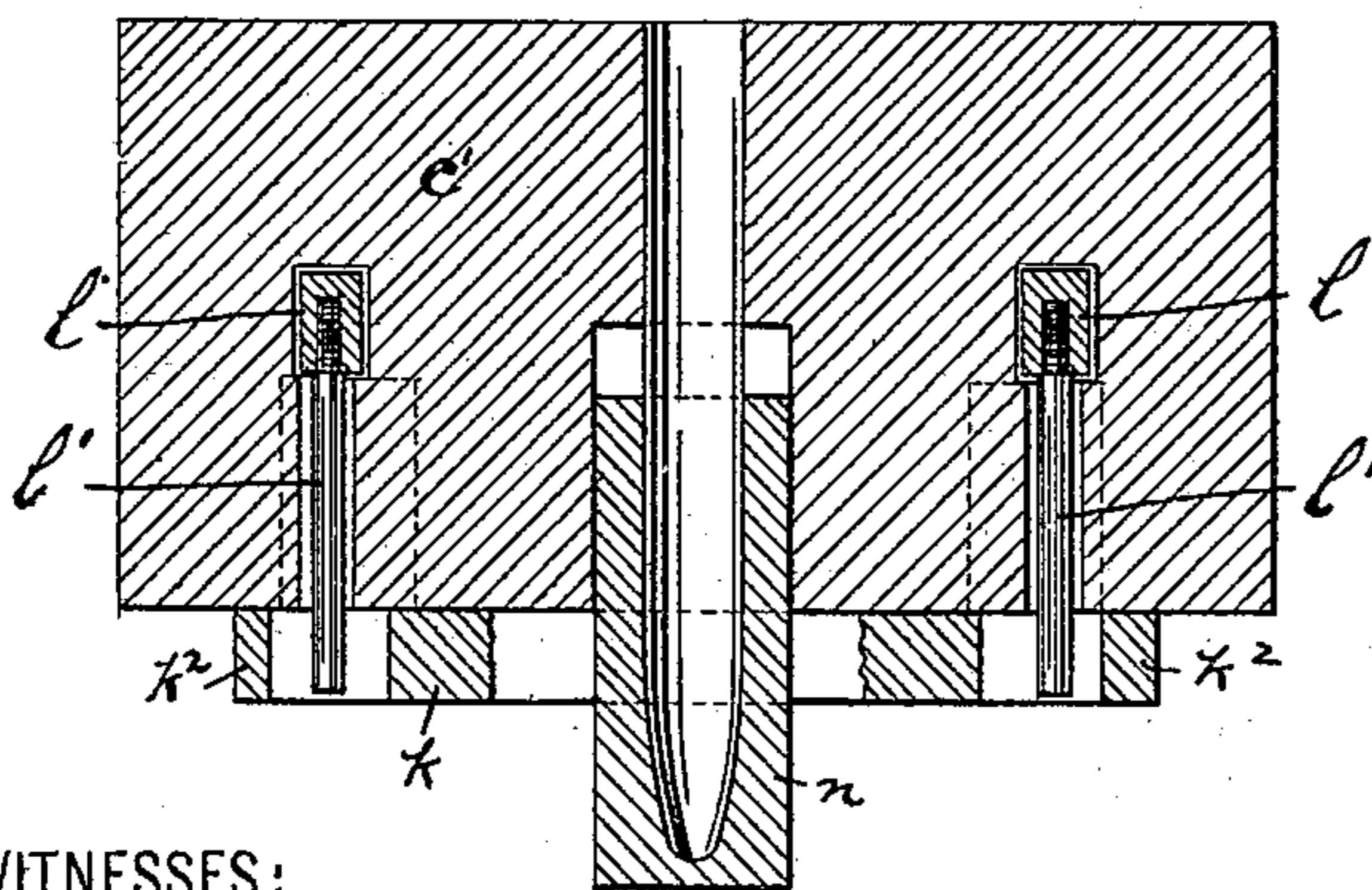


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN ILLINGWORTH, OF NEWARK, NEW JERSEY.

METAL-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 621,678, dated March 21, 1899.

Application filed April 21, 1898. Serial No. 678,319. (No model.)

To all whom it may concern:

Be it known that I, JOHN ILLINGWORTH, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Cold-Drawing Machines for Metal Rods; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The objects of this invention are to facilitate and render more convenient and easy the work of cold-drawing metallic rods, and particularly steel rods; to prevent the wastage of metal at the ends of the rods common heretofore in the methods employed in manufacture; to simplify the operations, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved cold-drawing apparatus or machine and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several views, Figure 1 is a side elevation of my improved machine. Fig. 2 is a plan of the same. Fig. 3 is a transverse section taken on line *x*, Fig. 2. Fig. 4 is a detail side elevation of the grip and its shifter. Fig. 5 is a section of the same, taken on line *y*; and Figs. 6 and 7 are respectively a plan and a sectional view of a certain separable die.

In said drawings, *a* indicates a bed or frame of the machine, which may be of any suitable length, the longitudinal side beams *a'* of which provide on their inner longitudinal sides slideways, upon which a movable draw-plate or die *b* slides longitudinally to and from a certain end grip *p* of said bed or frame. On the same said slideways, forward of said die *b*, is a second movable grip *c*. This also slides longitudinally on the slideways independent

of the sliding die, its movement being toward and from said die. Both the sliding die and sliding grip nicely fit the grooves of the slide-way of the longitudinal beams, so as to secure smooth and positive movements. At one end of the said frame I have provided on a suitable shaft or a pair of pivotal studs *d d* a pair of idle-pulleys *e*, preferably sprocket-wheels, and at or near the opposite end of said frame is arranged a pair of sprocket-wheels *f f*, which are fixed upon shafts *g g*, said shafts being each provided with gear-wheels *h h*, which intermesh one with the other, so as to secure simultaneous movements of both said sprocket-wheels, but in opposite directions. One of said shafts is provided with a power-pulley *i*, which is driven in any suitable manner. Said sprocket-wheels *e e* and *f f* are preferably arranged close or near to the inner sides of the longitudinal beams and are of a diameter about equal to the vertical width of said beams, although said wheels may be varied in size without departure from the spirit or scope of my invention. Over said sprocket-wheels are arranged endless chains *j j*, the links of which intermesh with the teeth of the sprocket-wheels *e f*. By the arrangement of said chains upon said sprocket-wheels as above described it will be evident that in operation the upper part of one of said chains will move in a direction opposite to the upper part of the opposite chain, or, in other words, the upper part of one chain and the lower part of the other chain will move in the same direction. Said chains at their upper and lower parts extend across the upper and lower sides of the draw-plate or die and the grip *c*, the said die and grip lying between, as shown in Fig. 3. Said draw-plate and grip are each provided with devices adapted to enter into engagement with either the upper or lower parts of the chains to clutch the same, so that the said die and grip will be compelled to move when clutched with said chains.

The clutch devices preferred are shown in Figs. 1, 2, 4, and 5, where the slides *b' c'* are each provided with a hand-lever *k*, resembling a bell-crank, said hand-lever having one arm or handle *k'*, adapted to receive the hand of the workman, and lower arms *k²*, which extend oppositely into engagement with sliding clutch-pins *l*, having bearings in the slides.

Said bearings are preferably near the vertical center of the slides to secure the greatest strength. The vertical perforations forming the bearings extend entirely through the slides, as indicated in Fig. 4, and the pins *l* are thus free to be raised to project above the said slide into engagement with the upper part of the chain belt or to be lowered to project downward into engagement with the lower part of the chain belt. Said pins *l* are in the construction described provided with lateral pins or projections *l'*, Figs. 4 and 5, to engage the hand-lever, the latter being suitably slotted to receive said pins *l'*.

By moving the lever in one direction on its fulcrum *k* the clutch-pin *l* at one side of the slide is brought into holding engagement with the upper part of one of said chains *j* and the lower part of the other of said chains is engaged by the opposite pin *l*, so that the said slide will be caused to move toward one end of the frame or the other. A reversal of the hand-lever *k* will throw the pins *l* in opposite direction and secure a reverse movement of the slide.

By arranging the hand-lever *k* so that the handle *k'* stands vertically the clutch-pins will all be disengaged from both chains, and as a result the slide will stand stationary in its bearings, where it may be locked. Both the draw-plate or die *b* and the grip or clutch *c* are provided with a clutch-lever and sliding pins to engage the chains and may in like manner be caused to travel on the slideways of the beams in either direction at the will of the workman. Any suitable dies *m* and gripping devices *n* to engage the rod to be drawn may be employed.

At one end of the frame the same is perforated, as at *o*, to receive the rod and is provided with a hand screw or clamp *p*. The rod to be drawn is first thrust through the end perforation *o*, so that the end of said rod will project a greater or less distance into the space between the longitudinal beams, and is firmly clamped in such position. The workman then manipulates the hand-lever and causes the sliding die to travel toward the rod thus clamped in position and pass over the projecting end, thus effecting a partial drawing of the end of the rod. The said die after having been passed over the said rod end, so that the latter projects beyond the die sufficient to receive the grip, the said die is fixed in position by means of lock-pins *r r*, and the grip *c* is in turn brought up to the said projecting rod end and clamped thereto. The movement of the grip is then reversed and the rod drawn through the die to completion.

Means are provided for taking up the wear on the chain, such as the adjusting-screws *q*, and supporting-rolls *s* may be employed for holding the lower portions of the chains up to the clutch-pins *l*.

Having thus described the invention, what I claim as new is—

1. The improved rod-drawing device herein

described, comprising a frame having slide-ways and, at or near one end, rod-clamping means, a sliding grip for the rod arranged on said slideway, a sliding draw-plate or die also arranged to slide on said slideway independent of said sliding grip, means for fixing the sliding grip to the frame and means for moving said die onto and over the end of the fixed rod and means for moving the grip toward the die and, after gripping the rod, moving said grip away from said die, drawing therewith the rod through said die, substantially as set forth.

2. The improved rod-drawing means herein described, comprising a frame having slide-ways and fast and loose pulleys at opposite ends, a pair of endless chains arranged over pulleys and movable lengthwise of the frame in opposite directions, operating means for said chains, clamping means stationed at one end of said frame, a sliding grip and a sliding draw-plate or die, means for fixing the die upon the frame, and pins arranged within said grip and die and adapted to be raised into contact with the upper portions of the endless chains and lowered into engagement with the lower parts of said chain and hand-levers fulcrumed upon said sliding grip and die or draw-plate and having oppositely-extending arms operating said pins to lower one and raise the other, substantially as set forth.

3. In a rod-drawing device, the combination with the frame, and sprocket-wheels, of a pair of endless chains, and means for operating said chains in opposite directions, a sliding die arranged on said frame, pins *l*, and a hand-lever fulcrumed upon said die and having oppositely-extending arms arranged and adapted to raise one pin and lower the other into engagement with the upper part of one chain and the lower part of the other, substantially as set forth.

4. In a rod-drawing device, the combination with the frame and sprocket-wheels, of a pair of endless chains, means for moving said chains in opposite directions, a sliding die arranged on the frame, pins arranged on said die and movable oppositely and a hand-lever having opposite arms engaging said pins to move the same into engagement with the chains, substantially as set forth.

5. In combination with the frame having a fixed clamp and sprockets *e, e*, at one end, and at the opposite end having sprockets *f, f*, and intermeshing gearing *h, h*, adapted to turn the sprockets *f f*, in opposite directions, chains *j, j*, arranged on said sprockets *e, e*, and *f, f*, a sliding grip a sliding draw-plate or die, means for attaching said draw-plate, or die and said grip to said chains *j, j*, at both the upper and lower parts thereof, substantially as set forth.

6. In a rod-drawing device, the combination with the frame, of a fixed clamp at one end of said frame, a draw-plate or die arranged on said frame next to said fixed clamp and having means to couple with the operat-

ing-chain whereby said die may be forced
over the end of the rod fixed in said clamp,
means for fixing said die in or to said frame
near the clamp, and a sliding grip arranged
5 on the frame at the side of the die opposite
the fixed clamp the said grip being adapted
to engage the reduced end of the rod project-
ing out from the die and continue the draw-
ing of said rod through the said die when
10 fixed, said sliding grip also having means for

engaging the chain, said chain and operating
means, all arranged and combined, substan-
tially as set forth.

In testimony that I claim the foregoing I
have hereunto set my hand this 9th day of 15
April, 1898.

JOHN ILLINGWORTH.

Witnesses:

CHARLES H. PELL,
C. B. PITNEY.