

(No Model.)

2 Sheets—Sheet 1.

L. J. KINGSLEY.
REDUCING PRESS.

No. 605,167.

Patented June 7, 1898.

Fig. 1.

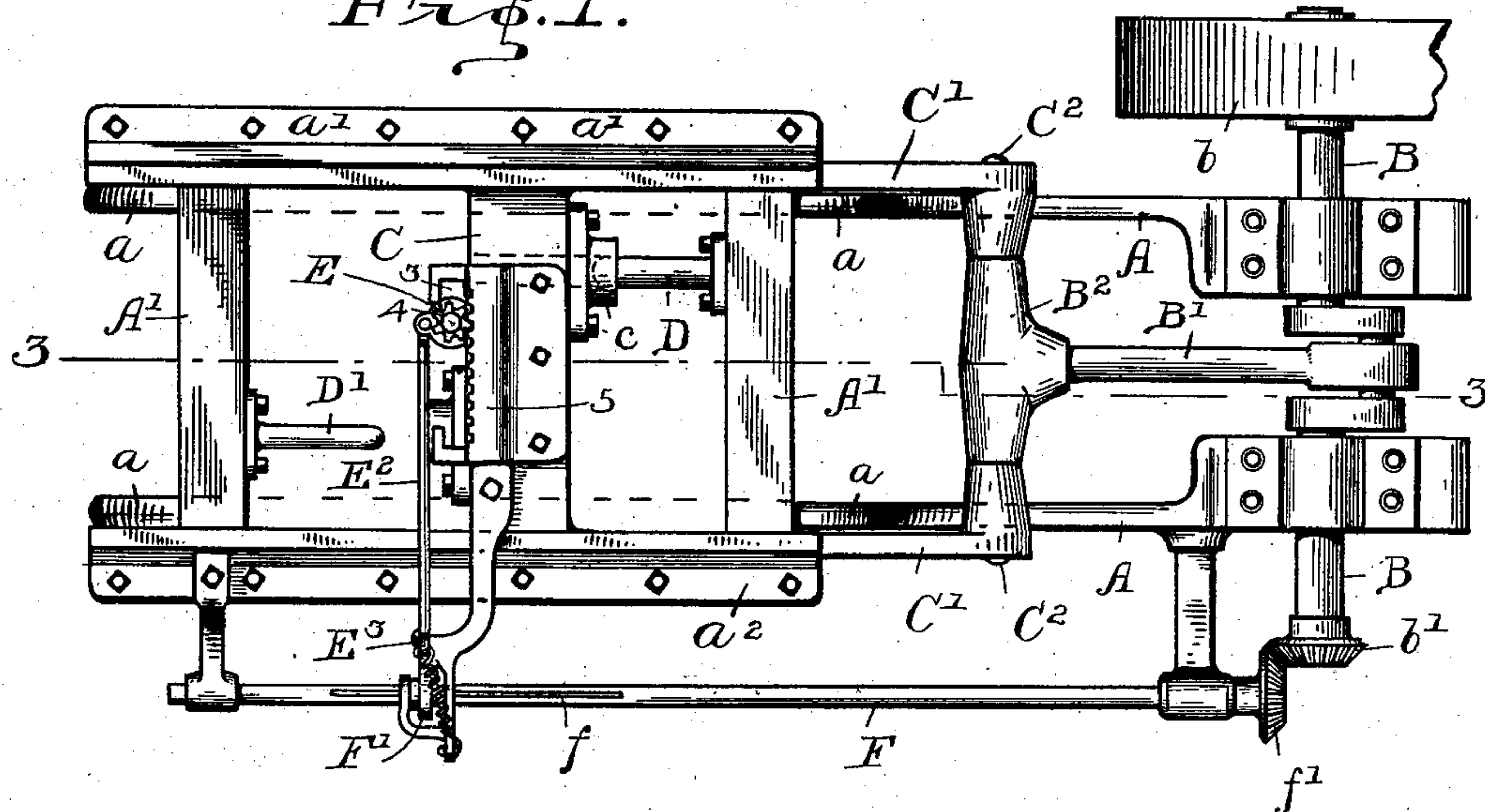


Fig. 2.

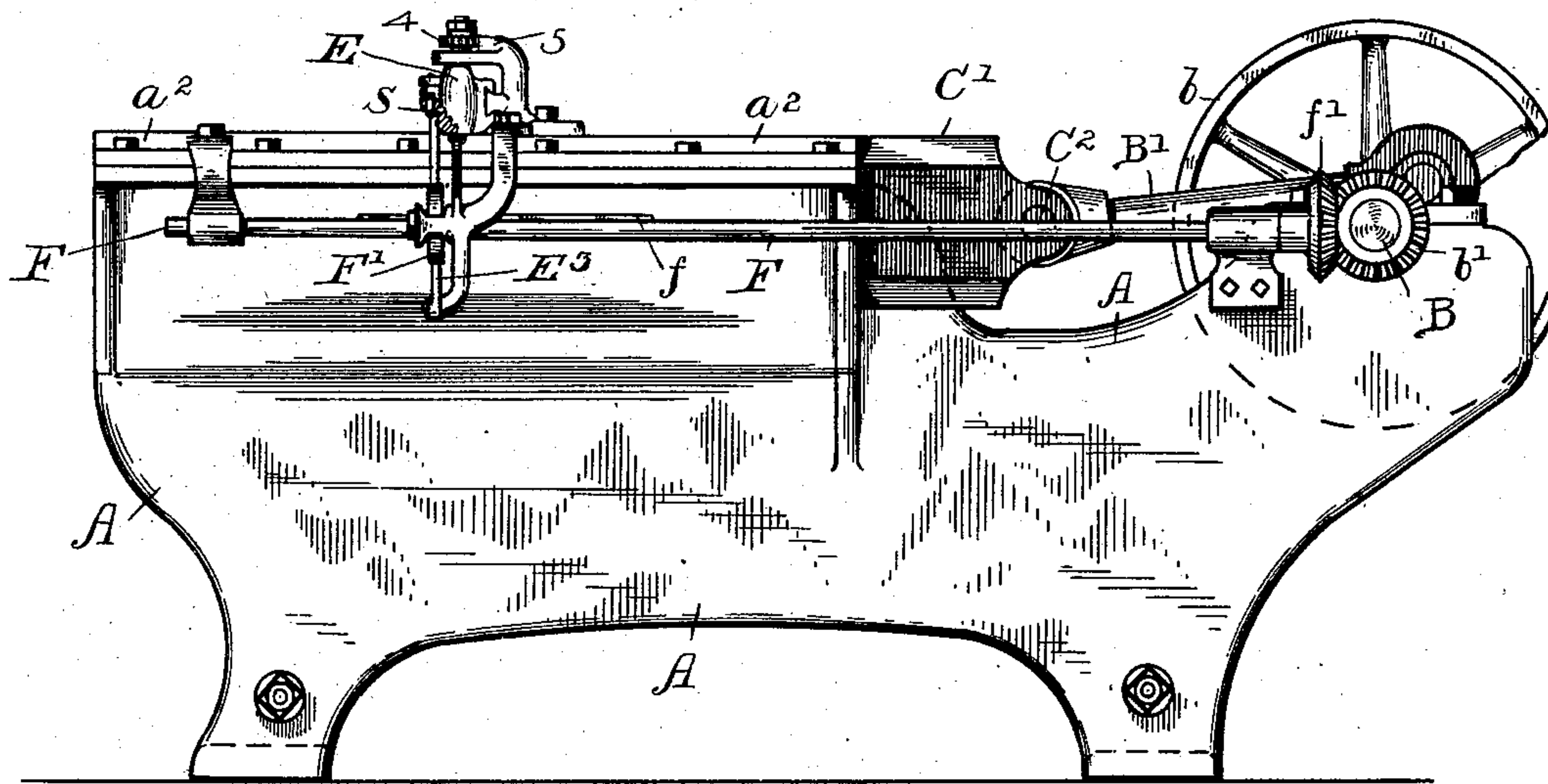
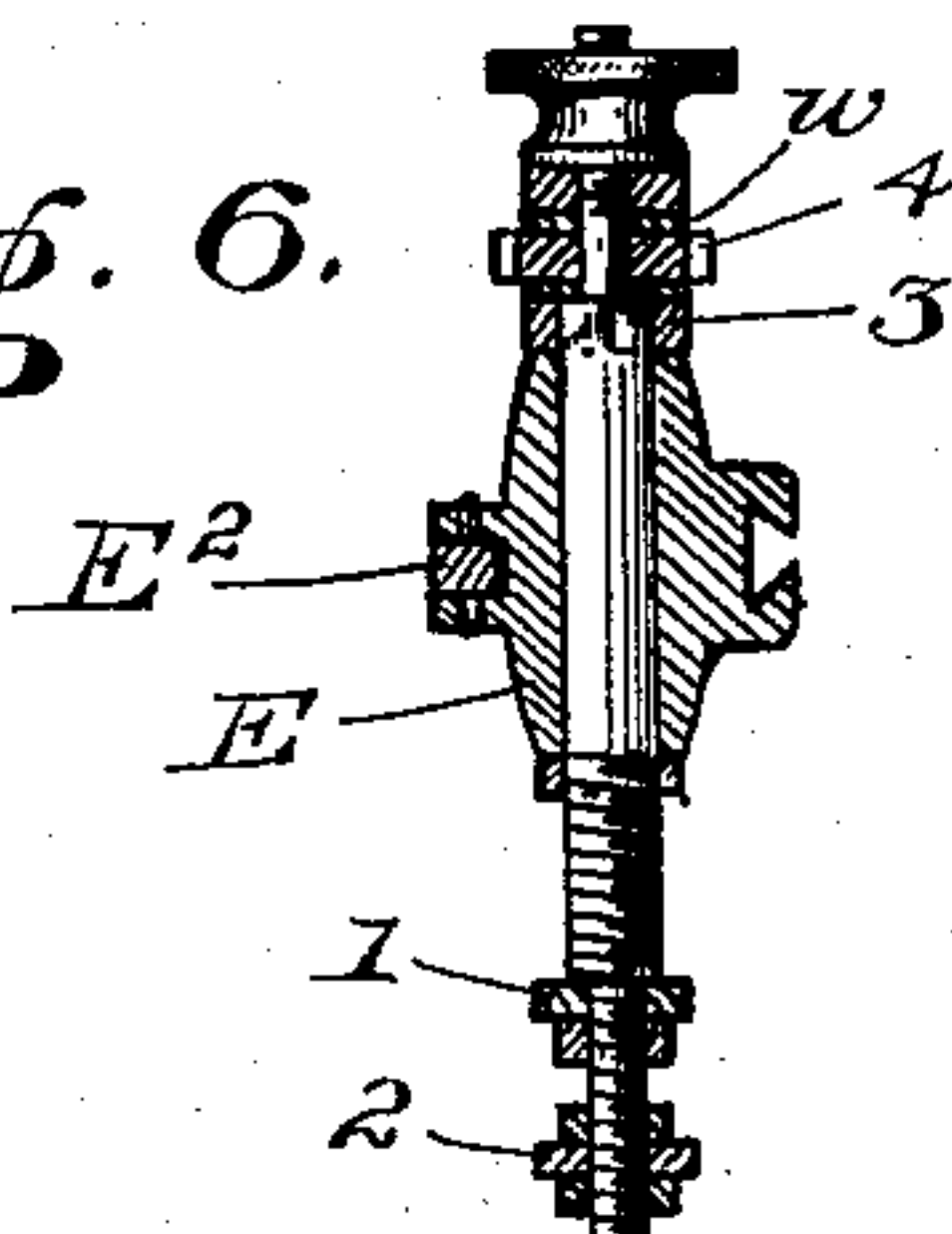


Fig. 6.

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(No Model.)

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Fig. 3.

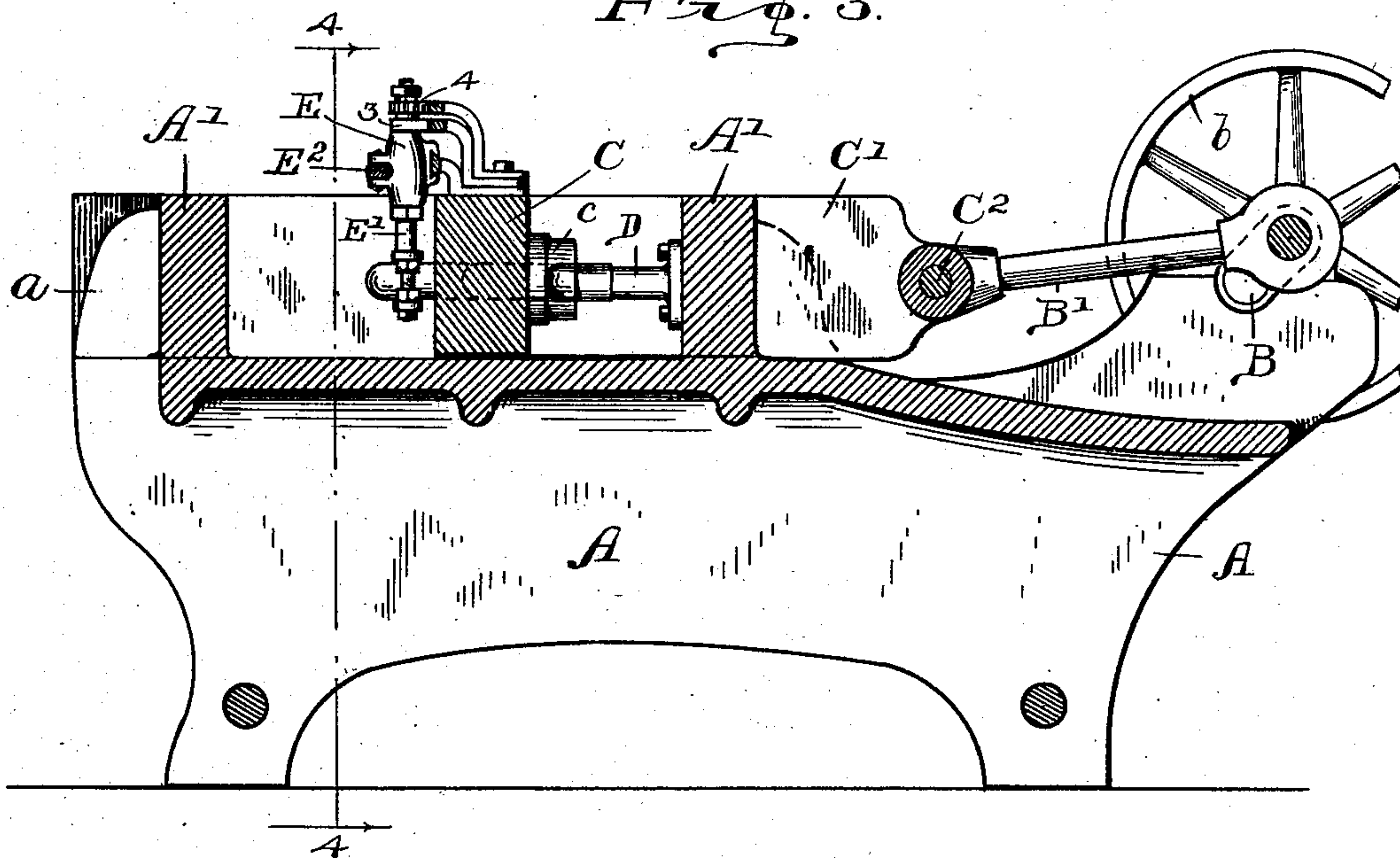


Fig. 4.

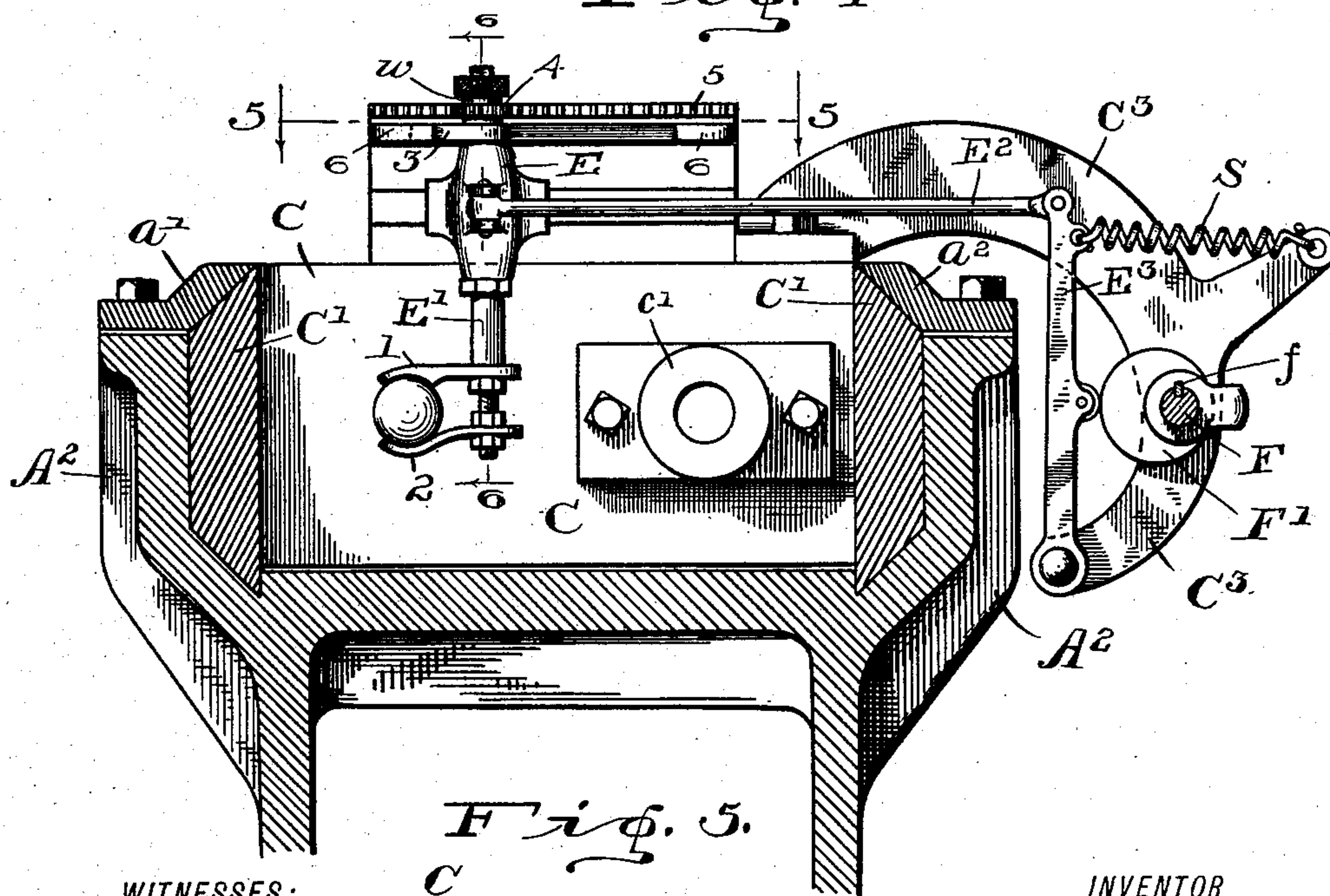
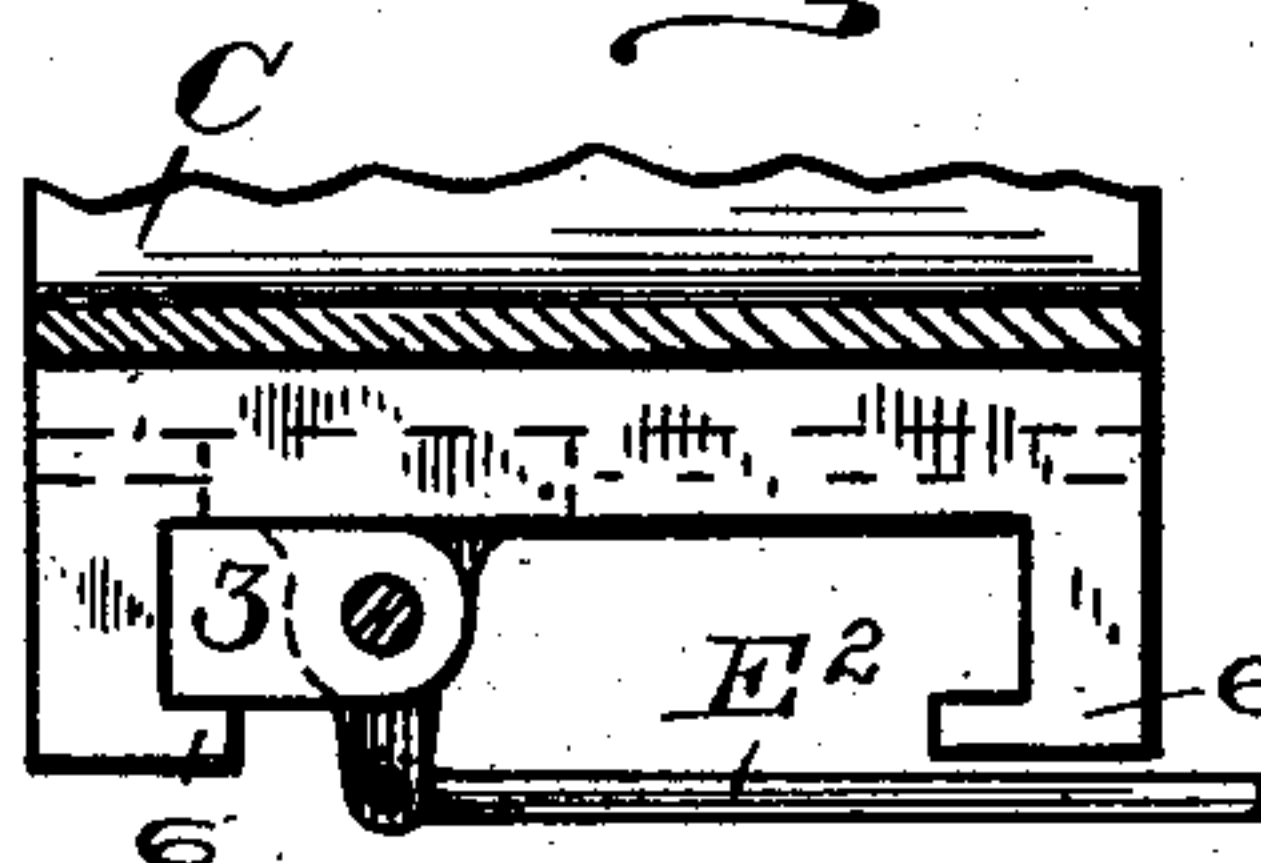


Fig. 5.

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UNITED STATES PATENT OFFICE.

LEWIS J. KINGSLEY, OF BINGHAMTON, NEW YORK.

REDUCING-PRESS.

SPECIFICATION forming part of Letters Patent No. 605,167, dated June 7, 1898.

Application filed June 11, 1897. Serial No. 640,303. (No model.)

To all whom it may concern:

Be it known that I, LEWIS J. KINGSLEY, a citizen of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented certain new and useful Improvements in Reducing-Presses, of which the following is a specification.

The object of my said invention is to produce a press in which both motions of the reciprocating die structure shall be utilized, thus making it possible for a press to do double the usual amount of work.

This invention is especially applicable to that class of presses by which metallic cup-like structures are made, such as cartridge-shells, shaft-tips, ferrules, and the like; and in the form shown it consists, generally speaking, of a reciprocating die-carrier with two female dies, a stationary male die located upon each side thereof, one upon one side and the other upon the other side of the center of the machine, and mechanism whereby the product from one pair of dies is automatically transferred to the other pair of dies, by which the operation is continued.

It further consists in certain details of construction and arrangements of parts, as will be hereinafter more particularly described and claimed. I desire it understood, however, that the parts may be transposed and numerous other changes may be made without departing from my invention.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters and figures of reference indicate similar parts, Figure 1 is a top or plan view of a machine embodying my said invention; Fig. 2, a side elevation thereof; Fig. 3, a longitudinal vertical sectional view as seen from the dotted line 3 3 in Fig. 1; Fig. 4, a transverse sectional view as seen from the dotted line 4 4; Fig. 5, a detail sectional view as seen from the dotted line 5 5 in Fig. 4, and Fig. 6 a detail sectional view on the dotted line 6 6 in Fig. 4.

In said drawings the portions marked A represent the main framework of the machine; B, the driving or crank shaft; C, the reciprocating die structure; D D' the stationary dies; E, a gripper-carriage having suit-

able grippers for transferring the partly-finished blanks from one die to the other, and F a shaft for operating said carriage.

The frame A, as is necessary in machines of this character, is heavy and rigid and in most sizes of machines is composed mainly of a single casting. It is peculiar in form, having heavy ribs (terminating in points *a*) which pass underneath and up behind heavy transverse bars A', which carry the stationary dies D and D'. Beyond those projections *a* which are nearest the crank-shaft the frame sides are recessed or cut away to permit the passage of the cross-head, which will be presently described. It then rises up to the appropriate height to serve as bearings for the shaft B.

The shaft B is mounted in the bearings therefor on the frame A. It has a pulley *b*, through which it is driven by a belt from some suitable source of power. (Not shown.) On the opposite end it has a bevel gear-wheel *b'*, which, through a similar gear-wheel *f'*, drives the shaft F. Centrally it is formed into a crank and drives the pitman B'.

The reciprocating die-carrier C preferably carries the two female dies *c* and *c'* and is itself carried by heavy side bars C', which extend outside the frame portions *a* to alongside the cut-away portion of the frame and thence pass inwardly and are connected to the rocking head B² on the end of the pitman B' by a rod or shaft C², which passes through both. The consequence is that when the shaft B revolves the die structure C and the dies which it carries are reciprocated. The form of the side pieces C' is best shown in Fig. 4, where they are shown as resting in the bearings in bracket-like projections A² on the frame A, being held in place by caps *a*², as shown. In the arrangement shown the female dies *c* and *c'* are fixedly attached to or formed integrally with this die-carrier C, and in any event the die-opening is continued by means of a perforation entirely through the structure which carries the female dies.

In operation in a machine constructed in accordance with my invention and arranged as shown the article being operated upon is first placed on or in front of the die D and by it forced through the female die *c* and car-

ried by the following article being formed through the die-carrier to its opposite side. As it emerges from the hole in the die-carrier it is seized by the mechanism about to be described and by it carried to in front of the female die c' in position to be operated upon by the male die D' at the same time the reciprocating die-carrier is receding from the die D . As above stated, this results in a duplication of the use of the machine, so that it performs twice as much work as a press having but a single motion.

The carriage E is mounted upon suitable ways on the reciprocating die-carrier C and moves longitudinally of said carrier, but transversely of the machine. Said carriage contains a rock-shaft E' , upon which are suitable gripping-fingers 1 and 2, which are adapted to grip the article being formed as it emerges from the orifice in the die-carrier C behind the female die c and transfer it to in front of the female die c' . These gripping-fingers, as is best shown in Fig. 4, are adjustably mounted and one or both (preferably the lower one) is in the form of a spring, so as to yield somewhat in use. The carriage E is attached, by means of a connecting-rod E^2 , to a vibrating arm E^3 , which in turn is mounted on a rigid arm C^3 , carried by the reciprocating die-carrier C , and is moved back and forth by said vibrating arm, as will be presently described. The shaft E' has an arm 3, which is rigidly attached thereto and projects out therefrom alongside a flat fixed surface on an adjacent portion of the carrier, and thus said shaft is permitted to revolve just ninety degrees and no more, so that in its movement in carrying one of the unfinished articles from one die to the other said article will be exactly turned end for end. For the purpose of revolving this shaft as it is pulled sidewise through the link E^2 , I provide a spur-pinion 4, which engages with a rack-bar 5 on an adjacent rigid portion of the carrier, the effect being, of course, that as the carriage E is pulled sidewise said shaft will be revolved in its bearing. It is necessary, however, that the travel of the carriage should be greater than is required to revolve the shaft the distance permitted. The pinion 4 is therefore not rigidly connected to the shaft, but is held thereon by friction between suitable washers w , bearing against said pinion upon one side and non-revolving parts upon the other sides. The necessary travel is thus permitted, while more than ninety degrees' revolution of the shaft is prevented. It is also necessary that the gripping-fingers shall be pulled sidewise away from the article being formed, and thus retreat out of the way of the dies before said dies have completed their work. I therefore, as shown in Fig. 4, provide a catch 6, which extends out around behind the arms 3, behind which said arm will pass as the carriage E reaches the end of its travel, and which

will prevent said arm and the shaft E from revolving until said arm has escaped from said catch, the frictional engagement of the spur-pinion 4 permitting such movement.

The shaft F is driven from the shaft B by means of the bevel-gears b' and f' . It bears a cam F' , which is kept from revolving thereon by means of a spline f , but is permitted to travel longitudinally of the shaft and said spline as the reciprocating die structure travels, as will be readily understood. This shaft is speeded at exactly the same speed as the crank-shaft, and thus the surface of the cam driven thereby can be arranged to operate regularly and uniformly in relation to the stroke of the reciprocating die-carrier. The cam comes in contact with an appropriate bearing-point on the vibrating arm E^3 and thus, through the link E^2 , operates the carriage E . This cam may be connected so as to operate said vibrating arm in both directions, or a spring S may be provided to operate it in one direction while the cam operates it in the other, as shown.

The operation of my machine may be briefly recapitulated as follows: An article to be formed is placed by any appropriate means on the point of the male die D . As the reciprocating die-carrier C approaches it said article is forced into the female die c and thence through said die-carrier and presently emerges therefrom on the other side. It is there taken by the gripping-fingers and transferred by the means described to in front of the female die c' , which by that time is approaching the male die D' . As the engagement takes place between these dies and the article being formed, the gripping-fingers are withdrawn sidewise in the manner described and returned to in front of the opening behind the female die c to repeat their operation.

I have shown and described a machine in which two of the die-carriers are stationary and one is adapted to reciprocate. It would obviously be a mere reversal of parts to have the intermediate die-carrier stationary and the others reciprocate. I have shown the intermediate die-carrier as bearing the female dies. It would also obviously be a mere reversal of parts to have the intermediate die-carrier carry the male dies and the end die-carriers carry the female dies. In each case these changes of course would require some rearrangement of mechanism; but such rearrangements are obviously within the skill of an ordinary mechanic and of course within the scope of my present invention.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a press, of two male and two female dies, mechanism whereby they are caused to approach and recede from each other alternately, one pair of dies being arranged to operate at one end of the stroke,

and the other pair at the other end of the stroke, and means whereby the device being operated upon as it emerges from one set of dies will be transferred to the other set of dies for further operation, whereby the same press is caused to perform work while moving in both directions.

2. The combination, in a press, of a reciprocating and two stationary die-supports, the reciprocating support carrying two dies, and each of the stationary supports carrying a single die and arranged upon opposite sides of the reciprocating die-support, and means whereby the article being operated upon as it emerges from one die shall be transferred to the other die.

3. The combination, in a press, of a framework having two heavy transverse bars, one at each end, a male die fixed upon the inner surface of each of said transverse bars, one upon one side and the other upon the other side of a central line drawn through the machine, a reciprocating structure carrying two female dies arranged respectively to operate with said male dies, and mechanism whereby the article being operated upon will as it emerges from the orifice behind one of the female dies be transferred to in front of the other female die ready to be operated by the other male die, substantially as set forth.

4. The combination, in a press, with two stationary dies and a reciprocating die-carrier carrying the dies forming the other members of the press, of a mechanism for transferring the article being operated upon from one pair of dies to the other consisting of a transversely-moving carriage mounted on said reciprocating structure and containing a rock-shaft bearing the gripping-fingers, an arm for preventing said rock-shaft from revolving beyond ninety degrees, and mechanism for operating said carriage.

5. The combination, in a press, of three die-carriers one of which has two die parts and the other two one die part each the dies whereof are adapted to operate successively upon the same article, mechanism for driving two of said die parts toward the other two, and a mechanism for automatically trans-

ferring the article being operated upon from the first to the second set of dies.

6. The combination, in a double-die press, with the two sets of dies, of a gripper-carriage E, a revoluble shaft mounted in said carriage and carrying the gripper-fingers, a revolution-stopping arm on said shaft whereby its capability of rotary movement is limited, a frictionally-mounted pinion on said shaft, a rack-bar engaging with said pinion, whereby said shaft is revolved during that portion of the travel of said carriage while said revolution-stopping device is free from contact with any adjacent part and is permitted to travel with said carriage without revolving when the revolution-stopping devices are in engagement, and said revolution-stopping devices.

7. The combination, with a double-die press, of mechanism for transferring the article being made from one die to the other consisting of a reciprocating gripper-carriage, a gripper-shaft revolubly mounted therein, a revolution-stopping arm or projection thereon, overhanging projections adapted to engage with said revolution-stopping projection, a loosely-mounted pinion also on said shaft, and a fixed rack-bar alongside said pinion whereby it is caused to revolve, said pinion being thus adapted to revolve said shaft when free from the revolution-stopping devices but to revolve on said shaft when said revolution-stopping devices are in engagement.

8. The combination, in a press, of the framework, the crank-shaft, the fixed die-carriers, the reciprocating die-carrier, the shaft F, the gripper-carriage mounted on the reciprocating die-carrier, a cam on the shaft F for operating said gripper-carriage, and connections from said cam to said carriage, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 1st day of June, A. D. 1897.

LEWIS J. KINGSLEY. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.