

No. 672,525.

G. A. GULOWSEN.

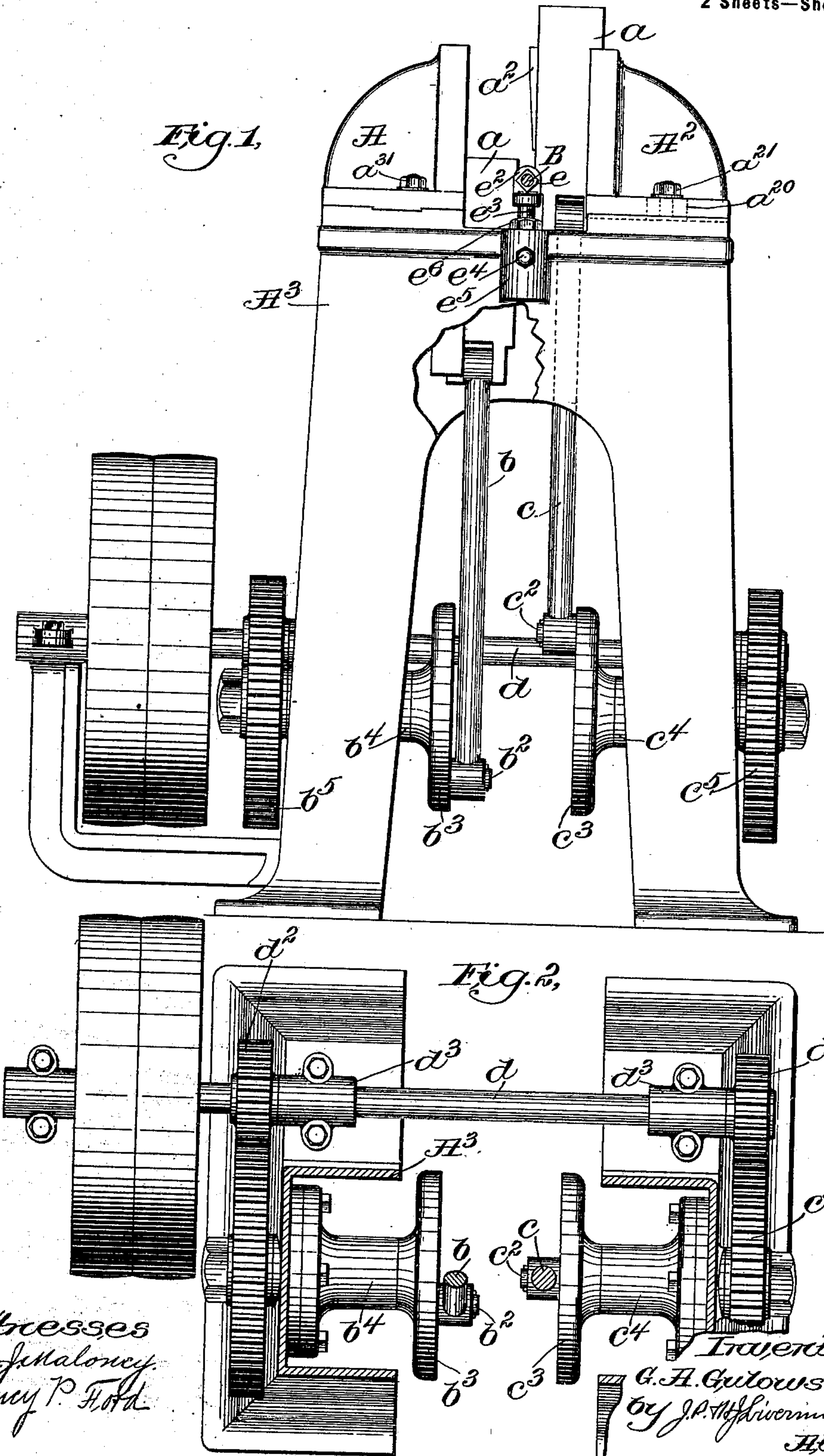
Patented Apr. 23, 1901.

ROLLING MACHINE.

(Application filed June 16, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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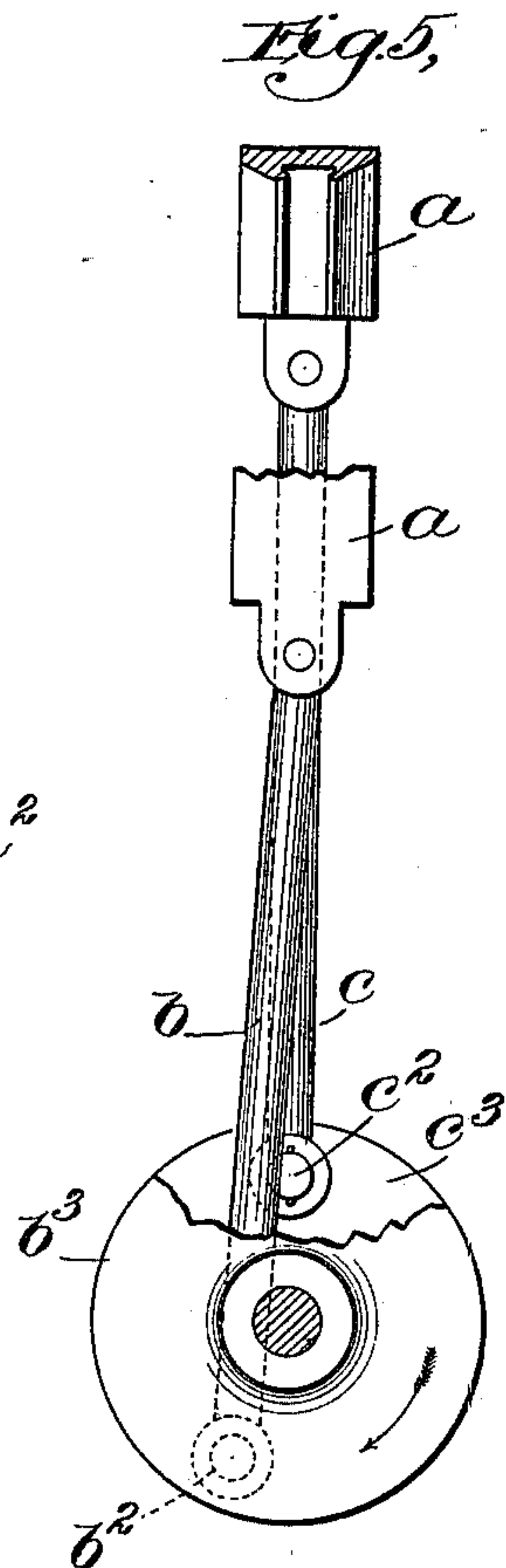
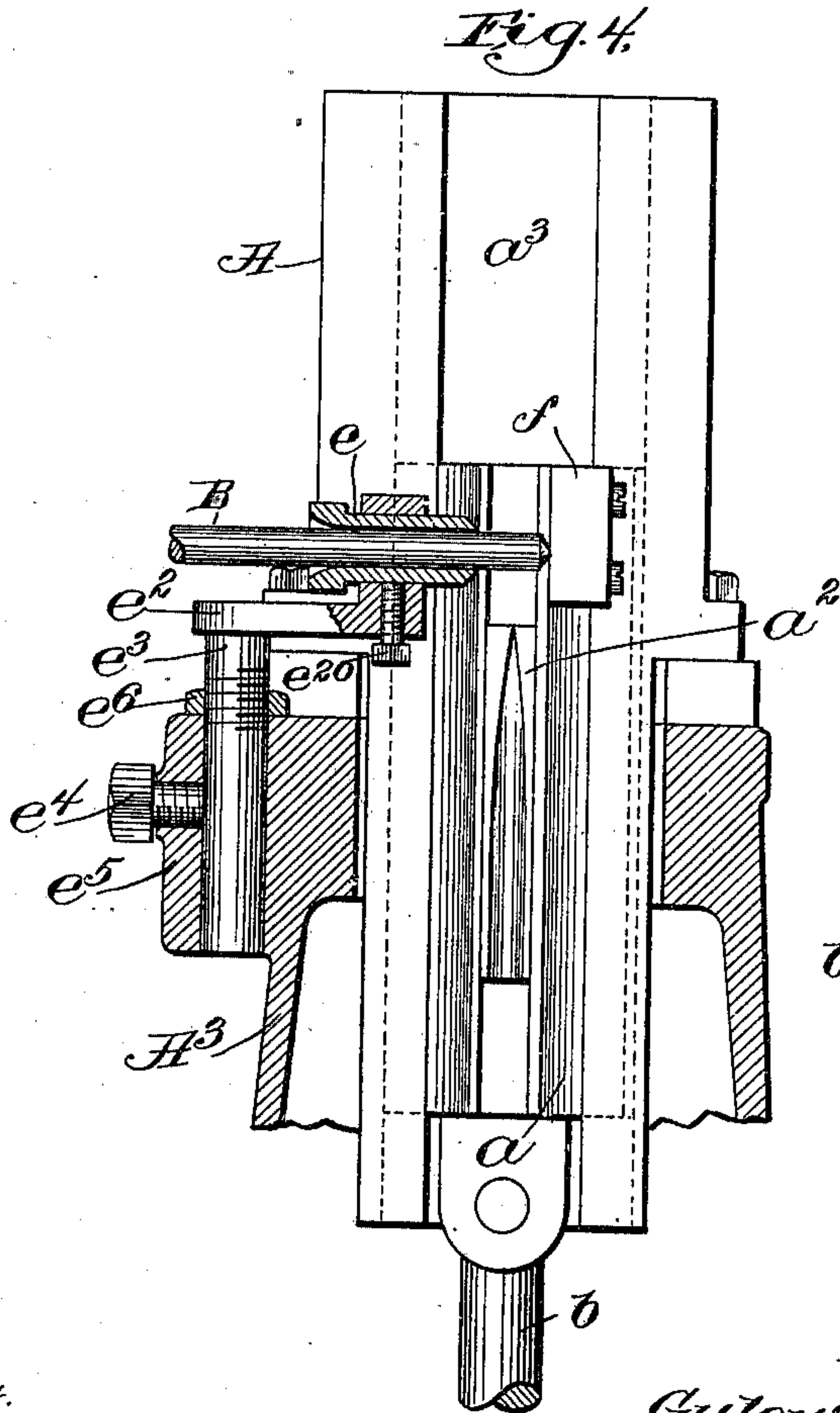
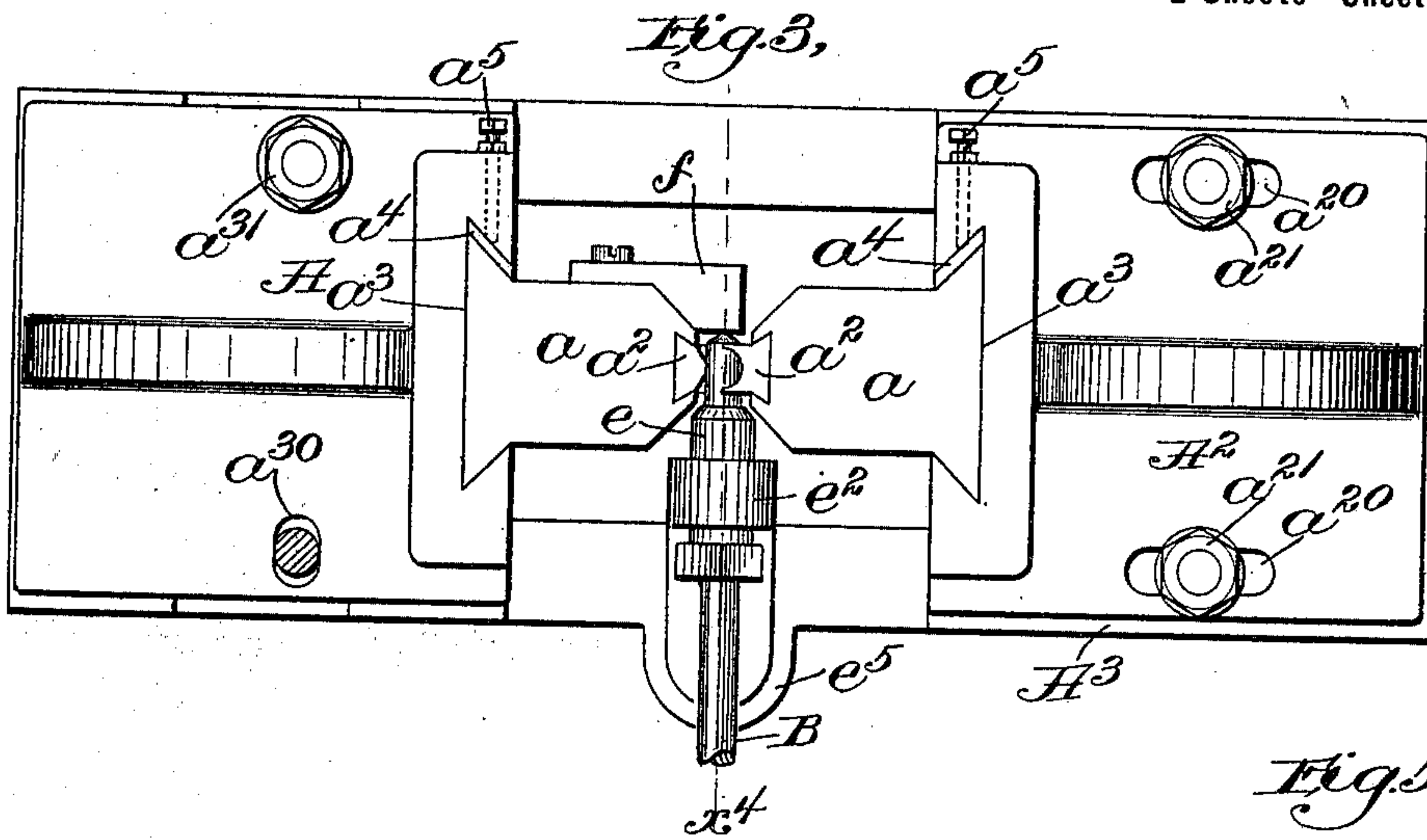
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2 Sheets—Sheet 2.



Witnesses
Jas. J. Maloney.
Nancy P. Ford.

Inventor,
Gutow H. Gutowson,
by J. P. & H. Livermore
Attys.

UNITED STATES PATENT OFFICE.

GULOW A. GULOWSEN, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR TO
THE SIMONDS ROLLING MACHINE COMPANY, OF SAME PLACE.

ROLLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 672,525, dated April 23, 1901.

Application filed June 16, 1898. Serial No. 683,578. (No model.)

To all whom it may concern:

Be it known that I, GULOW A. GULOWSEN, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented an Improvement in Rolling-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a rolling-machine, or a machine for making rolled forgings, and is embodied in a novel construction and arrangement of the operating mechanism for the platens or die-carriers. In making rolled forgings two oppositely-disposed dies of proper shape are caused to reciprocate one past the other in opposite directions, and a heated rod or bar of metal is inserted between and acted on by the dies which turn or roll the rod, properly shaping the part thereof which is between them and finally separating it from the remainder of the rod, which is moved forward into position to repeat the operation after the dies have been restored to their normal position. The dies operate during half only of the reciprocating movement, and it is essential to the best operation that the two dies should move uniformly—that is, that any acceleration which takes place in the movement of one during the active stroke should be accompanied by a corresponding acceleration in the movement of the other, and vice versa. As a matter of mechanical construction, moreover, it is desirable to employ a single actuating-shaft and to connect the same or a counter shaft or shafts driven thereby directly with the platens or die-carriers by means of pitmen, the pitmen being oppositely disposed, so that while one platen is traveling in one direction the other platen will travel in the opposite direction. It is a well-known fact, however, that when a reciprocating member is connected by a pitman with a crank the movement of said reciprocating member is not a uniform movement and, furthermore, that its movement in one direction does not correspond throughout to its movement in the opposite direction. If, therefore, in a rolling-machine the two platens were connected by pitmen with cranks having a common axis

and directly opposite to each other, the two platens in traveling one past the other would not travel at the uniform rate of movement which is necessary. This difficulty is obviated, however, in accordance with the present invention, by setting one of the crank ends or pitman connections somewhat in advance of the other and utilizing only a portion of the complete stroke of each platen for the actual operative movement, it having been found that by properly setting the pitmen as stated substantial uniformity of movement can be obtained throughout a considerable portion of the stroke, so that good results are obtainable. This results in a greater lack of uniformity in the return stroke or idle movement of the platens, which, however, is of course immaterial.

The machine embodying the invention can thus be very simply constructed and is very compact, so as to occupy a comparatively small space, while the two cranks or disks provided with wrist-pins may have a common axis and be capable of being driven directly by a pulley or indirectly, as shown, by gears cooperating with a single shaft.

Figure 1 is a front elevation of a rolling-machine embodying the invention. Fig. 2 is a horizontal section of the same, taken below the platens and platen-guides. Fig. 3 is a top plan view on a somewhat larger scale. Fig. 4 is a vertical section of the top portion of the machine, taken on the line x^4 of Fig. 3; and Fig. 5 is a diagram view illustrating the relative positions of the two pitmen.

The two platens or die-carriers a are shown as provided with dies a^2 , which may be secured thereto in any suitable or usual way and are arranged to travel in vertical guides a^3 , shown as undercut or dovetailed grooves formed in the upper portions or heads A A^2 of the machine, which in turn is supported upon the main frame A^3 . To insure the proper fit, the guides a^3 are shown as provided with keys or blocks a^4 , arranged to be adjusted by bolts a^5 . In the operation of the machine when the parts are in the position shown in Fig. 1 the rod B which is to be operated upon is inserted transversely between the platens, so that as the said platens reciprocate the rod will be engaged by the traveling dies a^2 and

rolled into shape, so that the finished article and the waste pieces are respectively severed from the remainder of the rod. To produce such reciprocating movement of the platens, the said platens in accordance with the present invention are connected, respectively, by pitmen b and c with wrist-pins b^2 and c^2 , carried by disks b^3 and c^3 , the said disks being mounted on shafts having a common axis and provided, as shown, with suitable bearings b^4 and c^4 in the main frame A^3 of the machine. In order that the down movement of the right-hand platen a after the die carried thereby has begun to act upon the rod may be substantially uniform with the corresponding up movement of the other platen, the wrist-pin b^2 is set somewhat in advance in the direction of rotation of the wrist-pin c^2 , the distance in advance being determinable in accordance with the proportion of the full stroke which is utilized in actually performing the rolling operation. This distance, furthermore, depends upon other relative proportions of the machine, there being no definite distance which will be suitable in all cases, it being essential, however, that for substantial uniformity of movement of the dies the two wrist-pins should not be exactly opposite. As herein shown, the disks b^3 and c^3 , which are provided with the wrist-pins, are driven by gears b^5 and c^5 , which mesh with gears d^2 on the shaft d , having bearings d^3 upon a portion of the frame A^3 at the rear of the machine and provided with fast and loose pulleys, as indicated in Figs. 1 and 2.

In order to insure the proper shaping of the article which is being rolled, it is desirable that the two dies should be exactly opposite to each other and exactly at the right distance apart, and to this end the platens are arranged to be laterally adjusted with relation to each other and also adjustable toward and from each other, these adjustments being afforded, as herein shown, by arranging the heads A and A^2 , in which are formed the guideways for the platens, so as to be adjustable with relation to the main supporting-frame A^3 .

To simplify the construction, the adjustment in one direction is afforded solely by the movement of one of said heads and the adjustment in the other direction is afforded solely by the movement of the other head. To this end the head A^2 is provided with one or more slots a^{20} , through which extend studs provided with lock-nuts a^{21} , so that by loosening the said lock-nuts the head A^2 may be moved toward or from the head A in order to vary the distance between the platens which travel, respectively, in said heads. Similarly the head A is provided with slots a^{30} , extending in a direction transverse to that of the slots a^{20} , the said slots a^{30} having studs provided with lock-nuts a^{31} extending through them, so that by adjusting the head A the dies may be brought directly opposite to each

other. To more clearly illustrate the construction, one of the studs which projects through the slots a^{30} is shown in section, Fig. 3. To support the rod in the proper position with relation to the dies, the machine is provided with a guide tube or passage e , shown as mounted in a vertically-adjustable supporting-socket e^2 , which is provided with a stem e^3 , held as by a set-screw e^4 in a supporting-lug e^5 and provided with an adjusting-nut e^6 , threaded on the rod and arranged to engage with the top of the socket portion e^4 .

To provide for the different sizes of guide-tubes e to accommodate rods of different sizes, the socket e^2 is shown as provided with a set-screw e^{20} , which is adapted to hold the guide-tube in said socket and at the same time admit of its removal and the substitution of another.

It is also desirable to determine the longitudinal position of the rod prior to each actual rolling operation, so that no more of the rod will project beyond the dies than is necessary to have sufficient of the material acted upon by the dies, since otherwise the material would be wasted. For this reason the machine is provided with a gage-plate f , shown as connected to one of the platens and arranged, as indicated in Figs. 3 and 4, to stand opposite to the tubular guide e when the platen to which the gage is secured is in the position assumed thereby prior to the actual rolling operation.

In operating the machine the attendant thrusts the rod into the tubular guide when the platens are in their initial position, as best shown in Fig. 3, until the end of the rod is arrested by the gage f , and the dies traveling one past the other then engage the rod and roll out or forge the article, separating it and the waste piece which projects beyond the dies from the main portion of the rod. The said rod is then held stationary by the attendant until the dies have returned to their normal position, and at this point the attendant again thrusts the rod forward as far as permitted by the gage f , so that it is ready to be operated upon at the next operating movement of the dies.

I claim—

1. In a rolling-machine, the combination with a pair of platens, or die-carriers; of a pitman connected with each of said platens; a crank or wrist pin for each pitman, said cranks being arranged to revolve around the common axis, and one being more than half a circumference in advance of the other in the direction of rotation, substantially as described.

2. In a rolling-machine, the combination with a pair of platens to carry the dies, the said platens being arranged adjacent to each other and capable of reciprocating movement one past the other in suitable guides; of a pair of disks mounted on shafts coaxial with each other; wrist-pins upon said disks, one

of said wrist-pins being more than half a circumference in advance of the other in the direction of rotation of the disks; gears connected with the shafts which carry the said
5 disks; and a driving-shaft provided with gears intermeshing with those of the disk-shafts, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GULOW A. GULOWSEN.

Witnesses:

HENRY L. GANTT,
H. J. LIVERMORE.