

No. 615,255.

Patented Dec. 6, 1898.

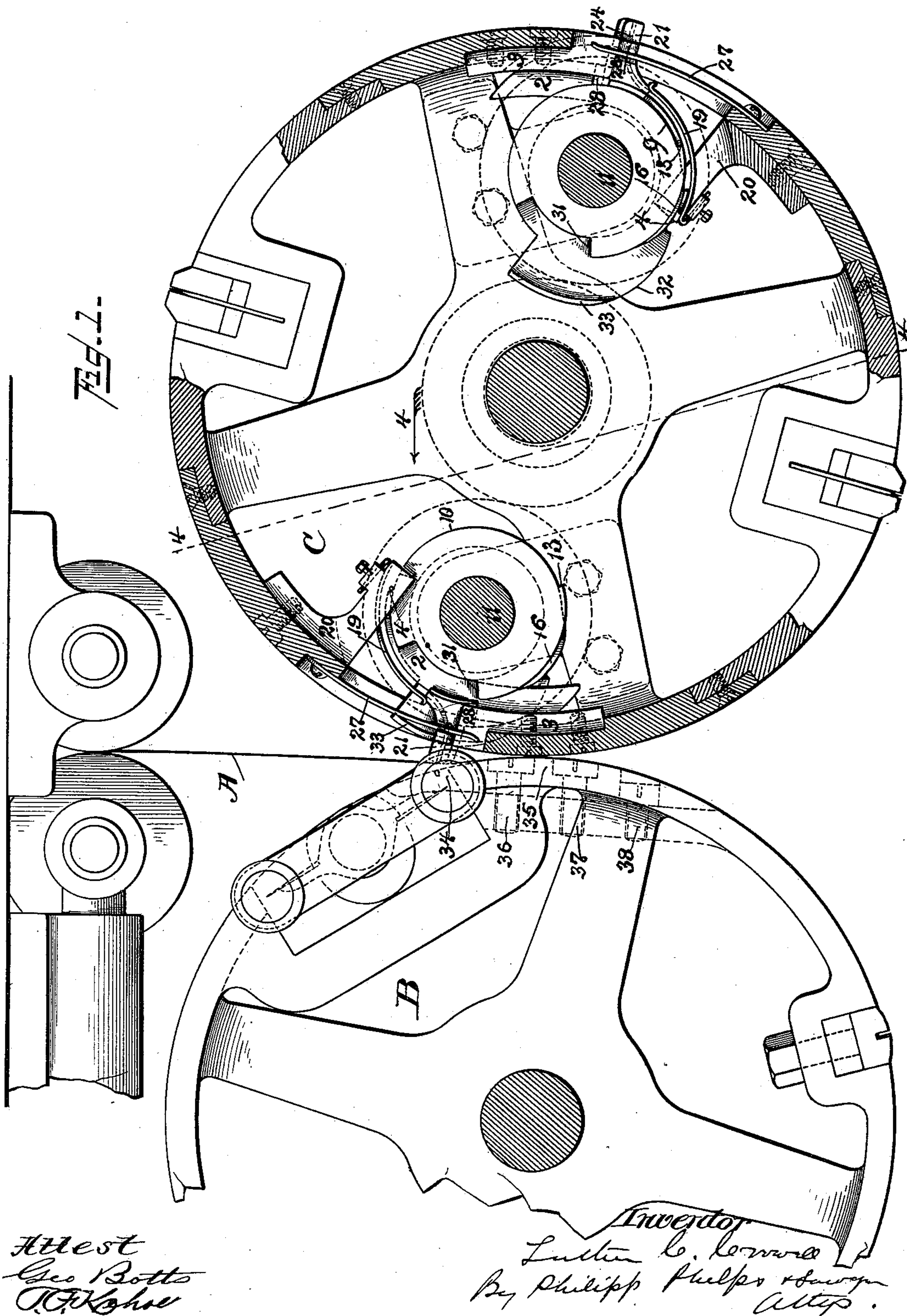
L. C. CROWELL.

STAPLE BINDING DELIVERY MECHANISM FOR PRINTING MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.)

6 Sheets—Sheet 1.



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Fig. 3.

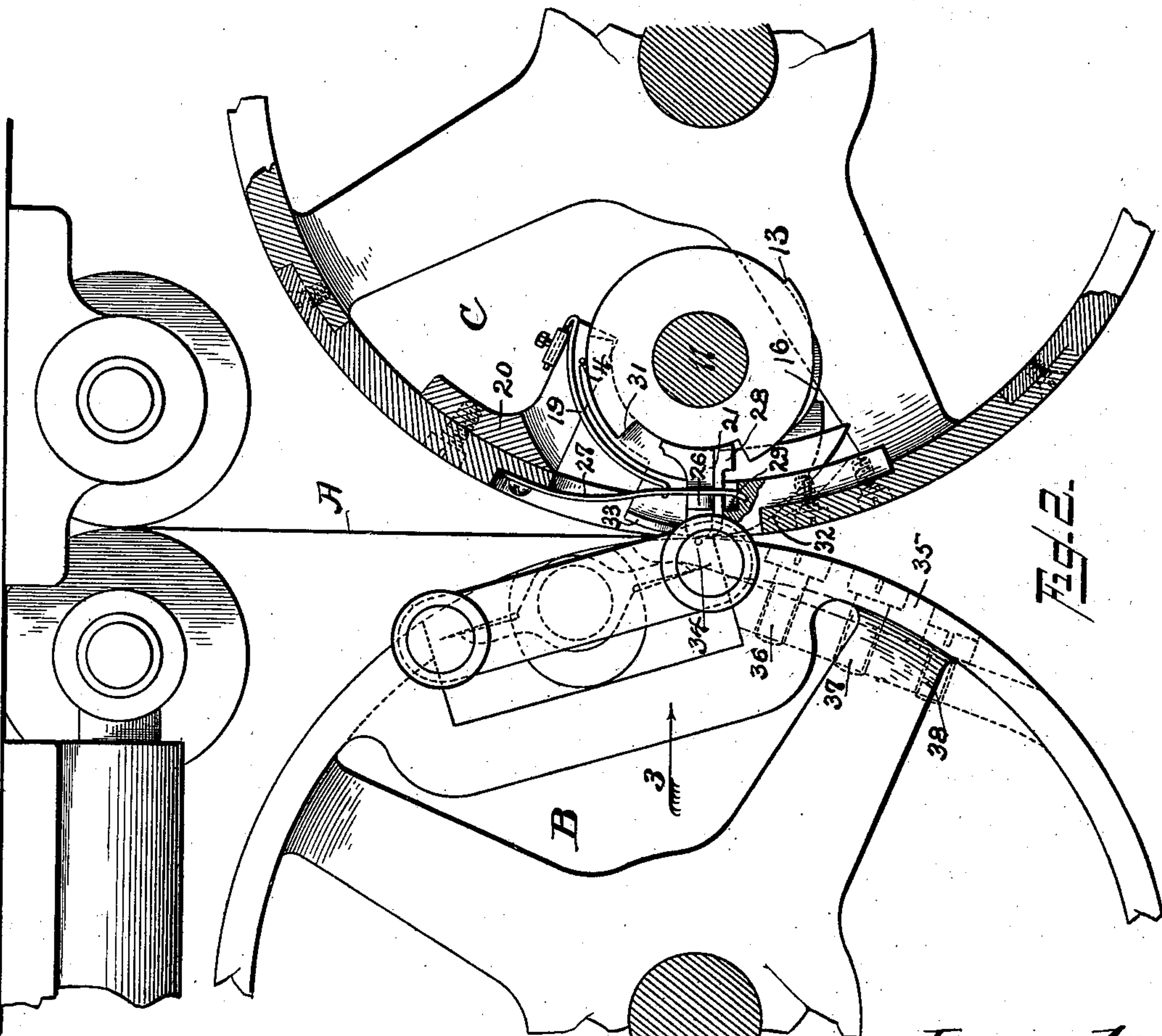
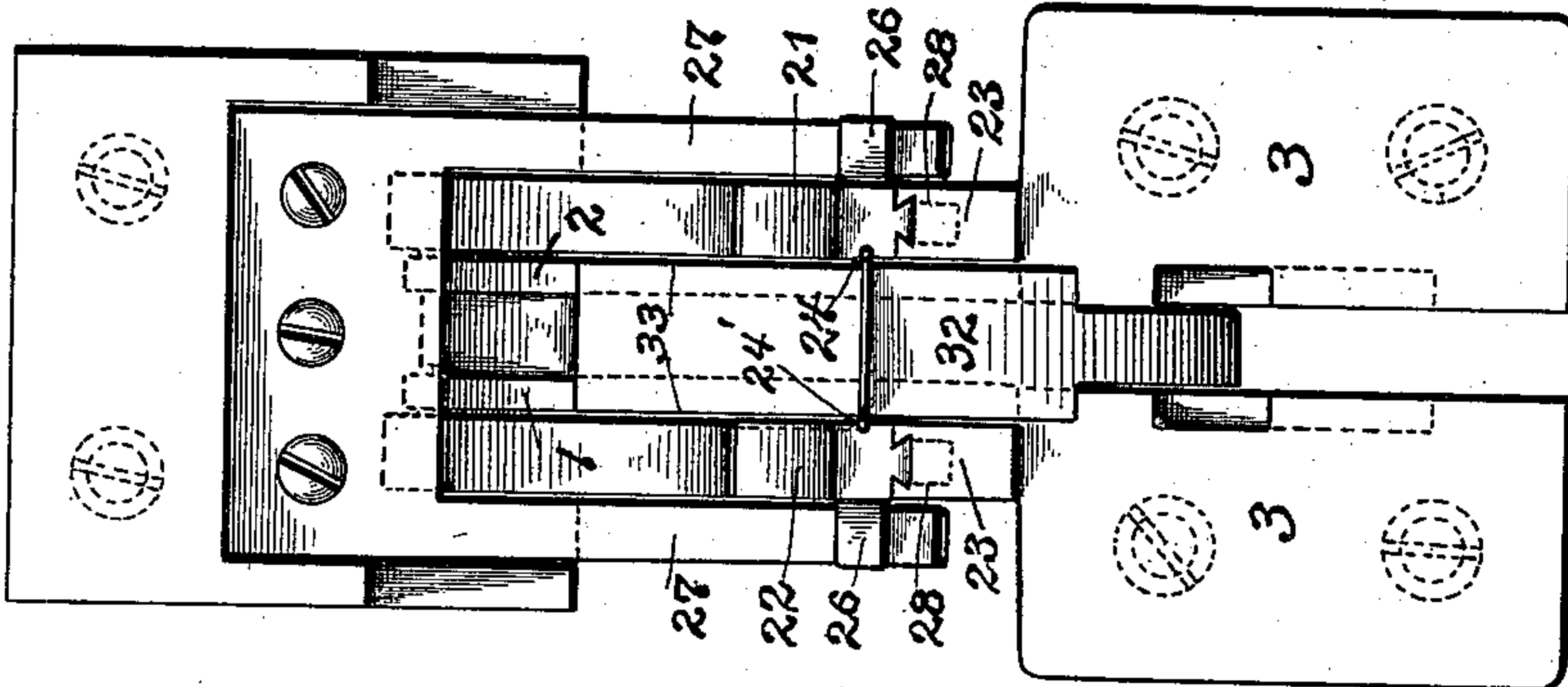


Fig. 2.

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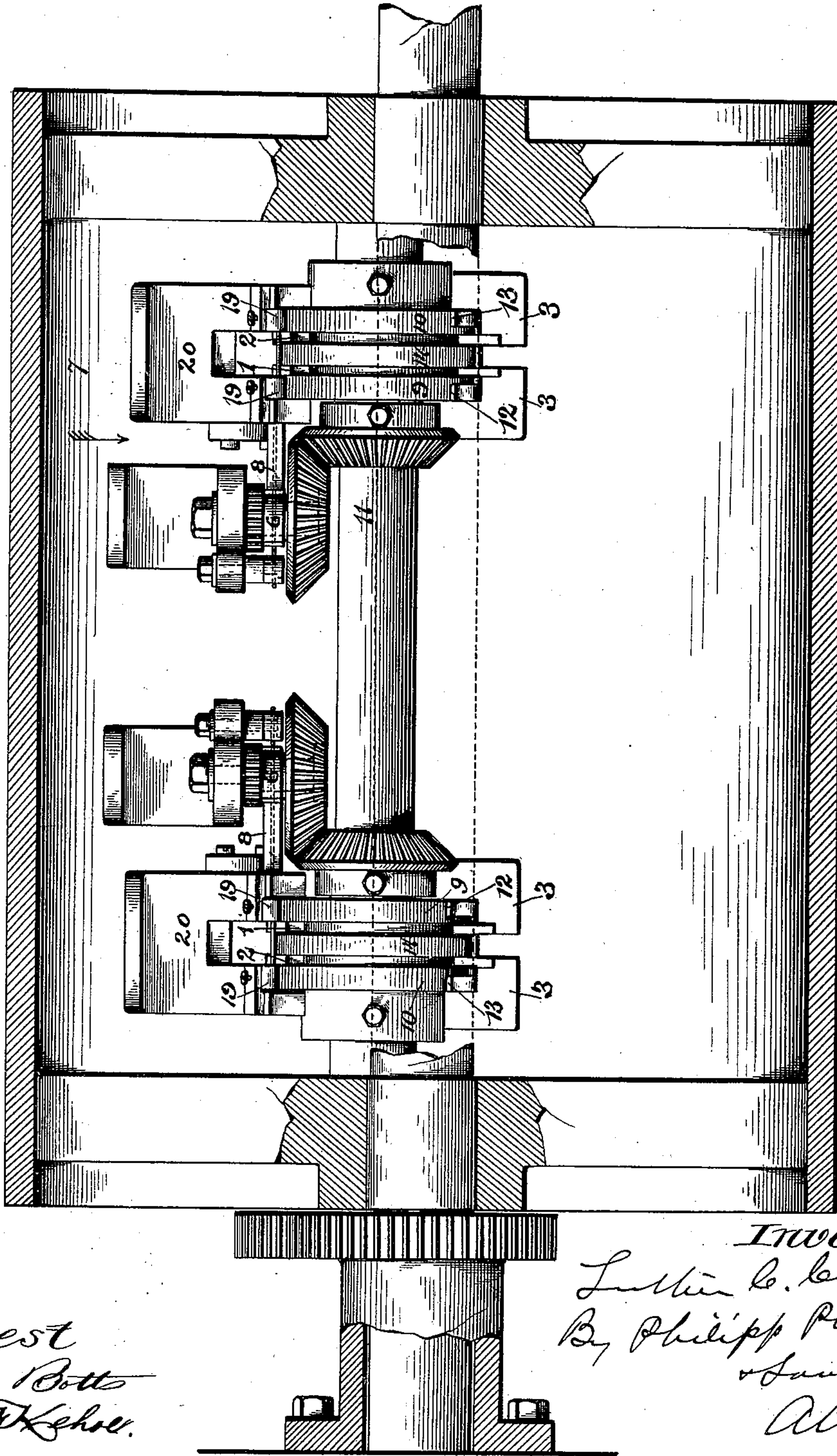
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Fig. 4.



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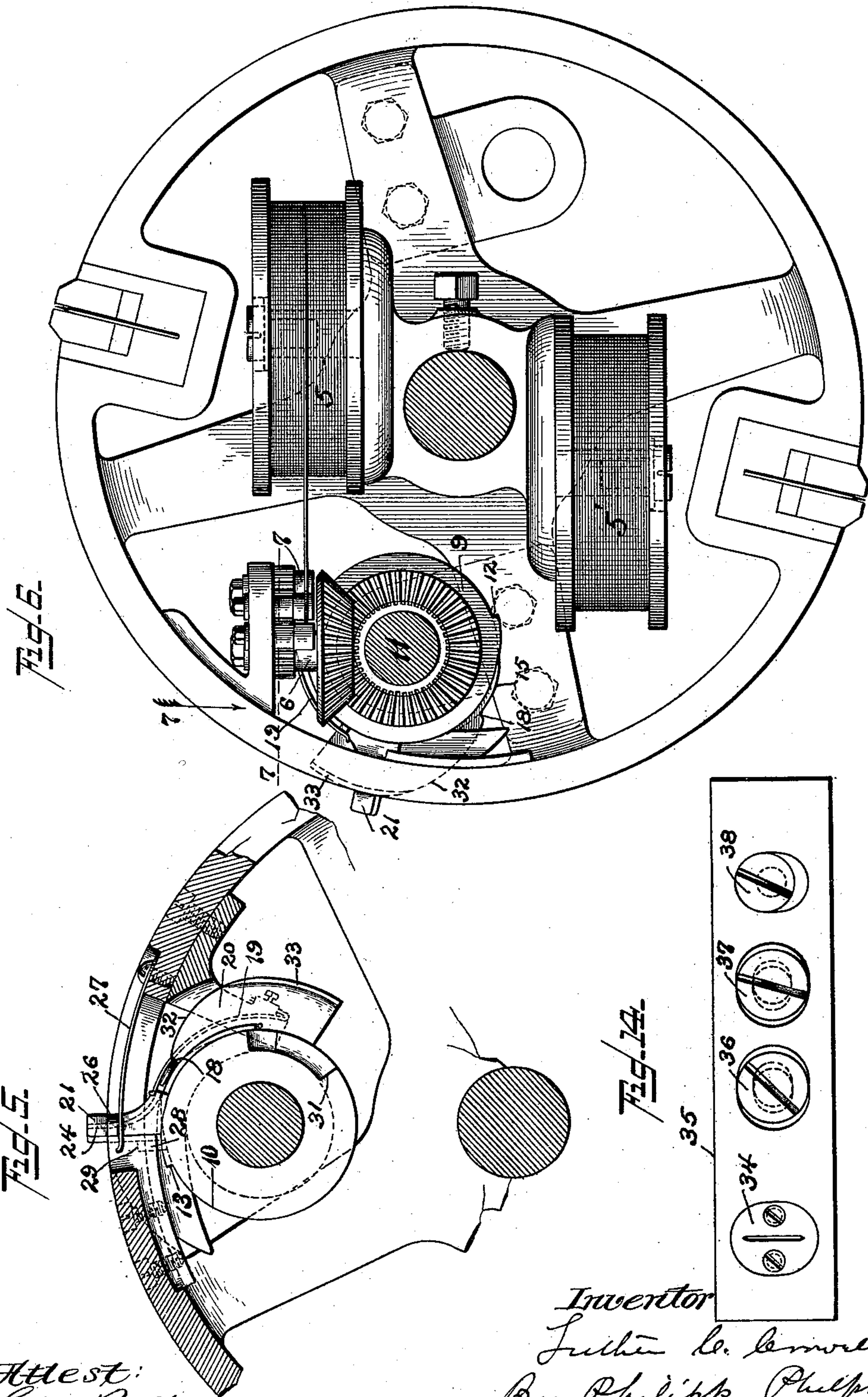
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(Application filed Dec. 31, 1897.)

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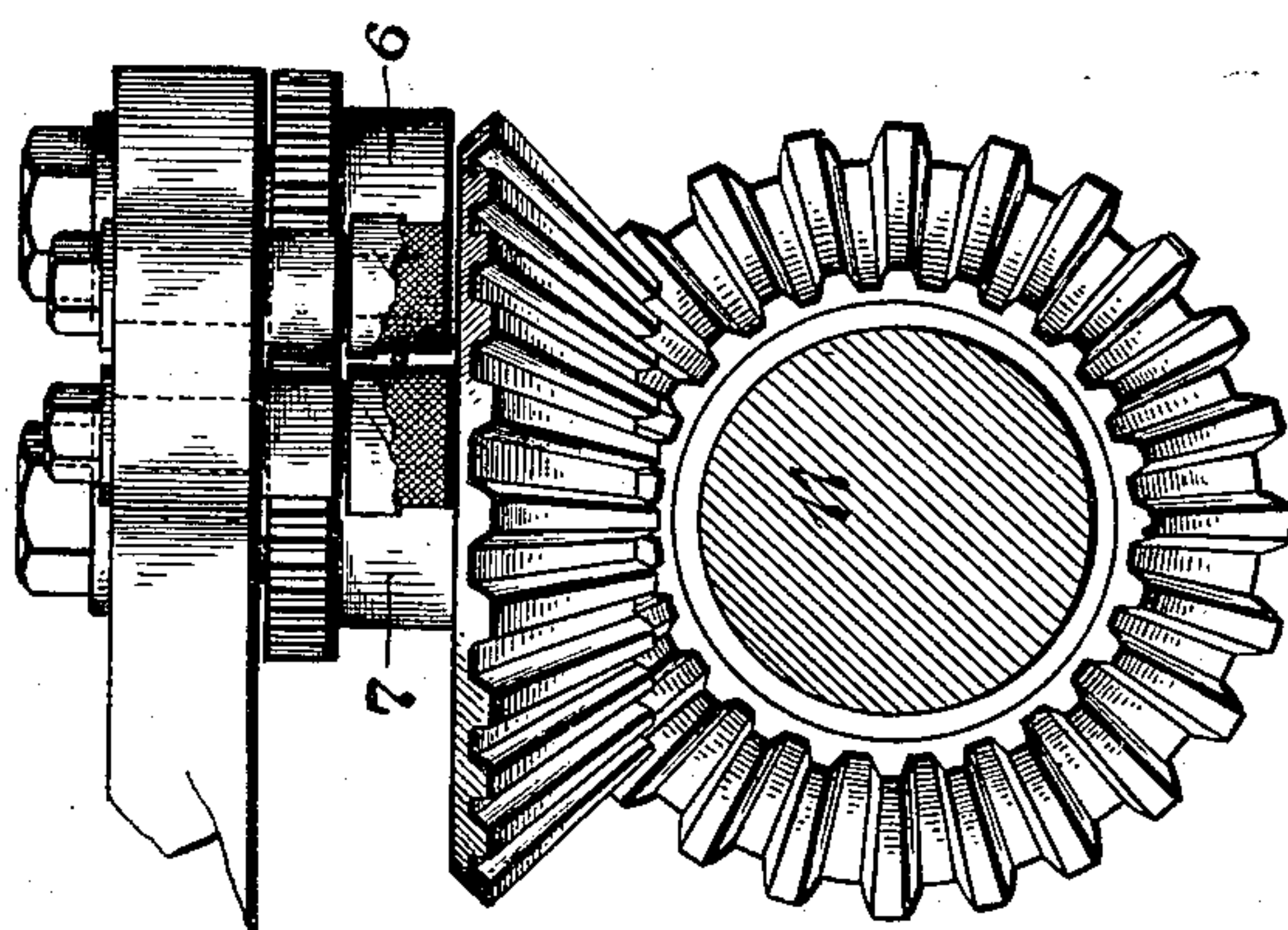
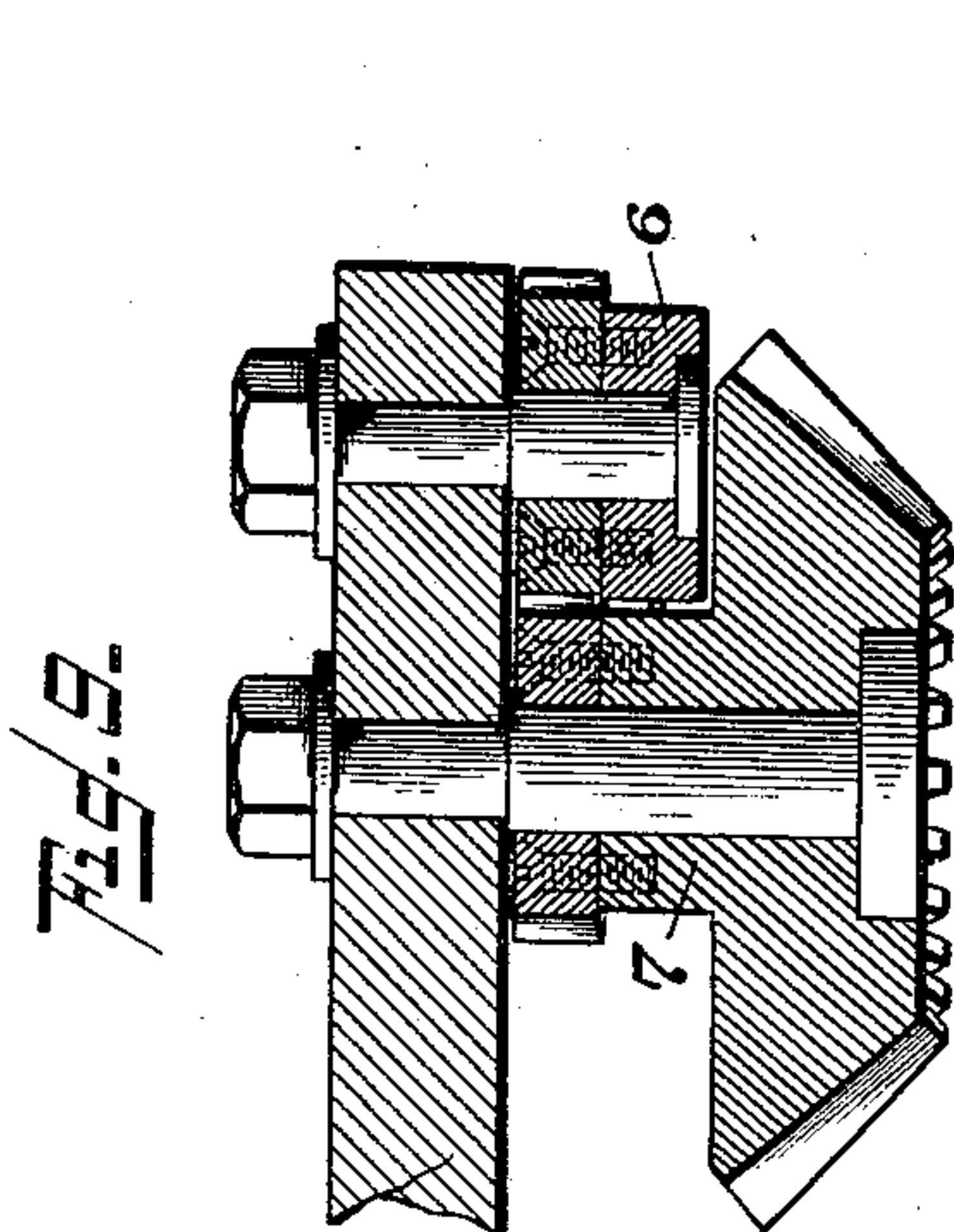
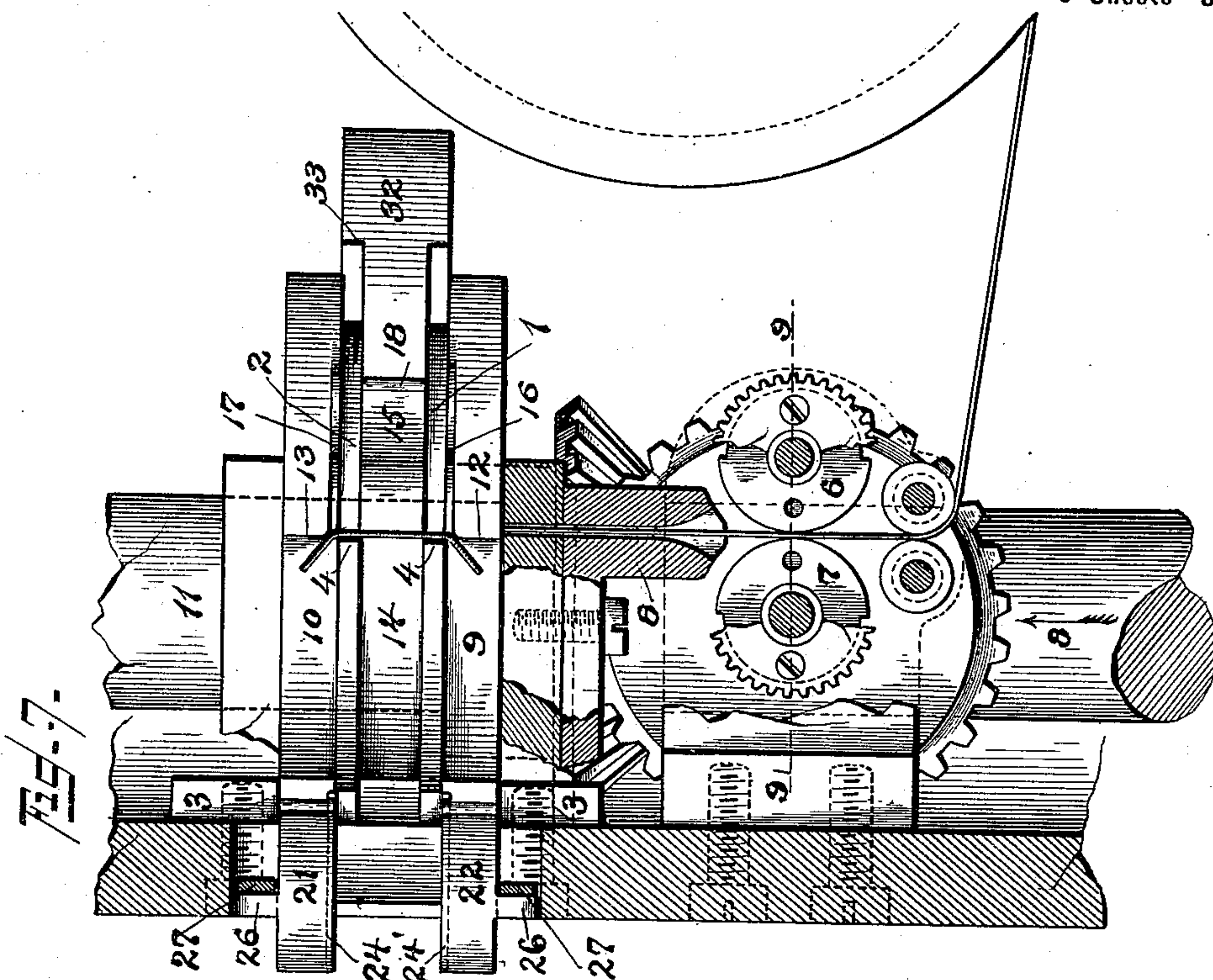
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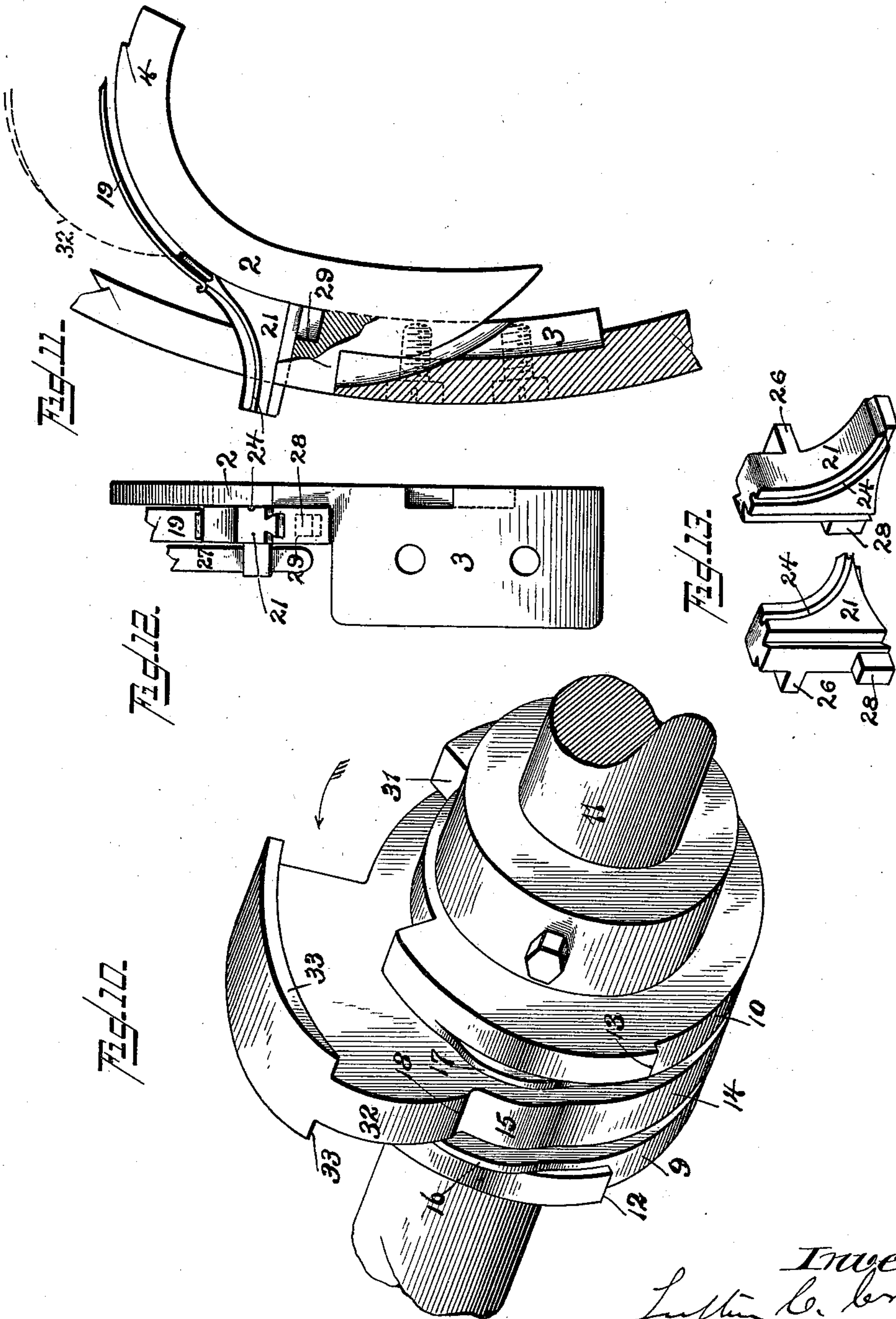
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(No Model.)

6 Sheets—Sheet 6.



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UNITED STATES PATENT OFFICE.

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THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF SAME PLACE.

STAPLE-BINDING DELIVERY MECHANISM FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 615,255, dated December 6, 1898.

Application filed December 31, 1897. Serial No. 665,167. (No model.)

To all whom it may concern:

Be it known that I, LUTHER C. CROWELL, a citizen of the United States, residing at New York, (Brooklyn,) county of Kings, and State of New York, have invented certain new and useful Improvements in Staple-Binding Delivery Mechanism for Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present improvements relate in a general sense to that class of stapling mechanisms especially adapted for attachment to a web-printing machine to form a part of the delivery mechanism thereof, whereby the plicated material in the form of webs or sheets may be bound together in packs on the line of ultimate folding thereof by means of staples made and set therein during the onward progress of the said plicated packs for final delivery, and thus form a completed product, such as a pamphlet or newspaper, whose leaves are bound together in the form of a book-like product. In a general sense the type of such machines is comprehended in Patent No. 510,528, and more specifically the improved machine is of the class in which the staple forming, presenting, and inserting mechanisms are contained within the confines of a rotary carrier supporting them, which carrier also supports the wire-length-supplying means delivering material to form the staple, which class has its type disclosed in Patent No. 510,843.

In the drawings annexed hereto and forming a part of this specification, Figure 1 is a sectional view of the stapling and folding cylinders, showing the parts of the left-hand stapling mechanism of Fig. 4 in the position in which they are just before the stapling operation. Fig. 2 is a similar view of the same parts at the moment of driving the staple. Fig. 3 is a plan view of a stapling mechanism carried by the carrier B, the line of sight being that of the arrow 3 in Fig. 2. Fig. 4 is a section on the line 4 4 of Fig. 1, the line of sight being in the direction of the arrow 4 in Fig. 1 and the cutting mechanism being omitted for perspicuity. Fig. 5 is a view of a portion of the parts shown in Fig. 1, the position,

however, being that in which the staple is about midway between the point at which it is formed and the point at which it is set. Fig. 6 is an end view of the carrier. Fig. 7 is a plan view, on an enlarged scale, partly in section, on the line 7 7 of Fig. 6, the point of view being in the direction of the arrow 7, the stapling mechanism being that shown on the right in Fig. 4. Fig. 8 is a view, partly in section, of the mechanism shown in Fig. 7, the line of sight being indicated by the arrow 8. Fig. 9 is a section on the line 9 9 of Fig. 7. Fig. 10 is a detail view of the staple bending and lifting disks shown separately, the stapling mechanism being that shown in the left in Fig. 4, the view being inverted from that shown in Fig. 4. Fig. 11 is a side view of one of the anvil-carrying arms and the plate to which it is attached, the point of view being between the arms 1 and 2 on the right-hand side of Fig. 4. Fig. 12 is a plan view of the same detached from the cylinder. Fig. 13 shows two perspective views of one of the guide-blocks, and Fig. 14 shows the staple-leg-clenching anvil-block and the adjustable plate upon which it is mounted.

The stapling mechanisms on the right and left hand ends of the carrier are substantially alike and the parts of each are symmetrically placed with reference to each other. A description of one will therefore suffice for both.

Referring to said drawings, the web or webs of paper A are led to the stapling mechanism from any appropriate printing and folding or associating mechanism between the carriers B C, which support the stapling mechanism and which may also carry cutting and folding mechanisms, although, of course, if preferred, the cutting and folding operations may be performed by other means. The staple-forming mechanism consists of two arms 1 2, which are carried by the plates 3, fixed to the cylinder-shell, these arms being provided with shoulders or abutments 4, which together form an anvil, against which the wire is bent to form the staple. The wire is fed from spools 5 5', mounted upon the end of the cylinder between guide-rollers and feeding-disks 6 7, and into guiding-slot 8, which latter conducts the wire to a position where it lies against

the anvil-shoulders 4. The feeding-disks 6 7 are in the construction shown cut away, so as to make the feed intermittent; but, if desired, the feeding-disks may be made continuous, the parts being so arranged in that case as to give the wire clearance for movement as it is fed forward.

The staples are bent by a bender consisting of two forming-disks 9 10, mounted upon a shaft 11, journaled in the cylinder, these disks 9 10 being placed one on either side of the arms 1 2 and having shoulders or dies 12 13, which cooperate with the anvil-shoulders 4 to bend the staple, as best shown in Fig. 7. Shoulder 12 also serves as a knife to sever the staple-forming length of wire. Space is left between the arms 1 2 and the disks 9 10 for the reception of the staple-legs when bent.

Mounted on the shaft 11 between the disks 9 10 and also between the arms 1 2 is a third disk 14. The disk 14 may be provided with a cam-like surface or a rise 15, which acts to lift the middle portion of the staple after it has been bent over the anvil-shoulders 4 and into the position shown in Fig. 5. The disks 9 10 are also provided with similar rises 16 17 for the purpose of lifting at the same time the legs of the staple, so that the staple as a whole shall lie tangentially to the circumference of the disks 9 and 10. The disk 14 is also provided immediately behind the rise 15 with a shoulder 18, which engages with the central portion of the staple and carries it forward when it is lifted above the anvil-shoulders, as shown in Fig. 5. The staple is retained in this position by a curved spring or metal strip 19, attached to the framework of the carrier by a bracket 20. The three disks 9 10 14 may be made separate and fixed to the shaft, or they may be made in one piece.

At the point where the circumference of the disks 9 10 comes nearest to the circumference of the carrier B are mounted two guide-blocks 21 22, which are dovetailed into block 23, fixed to the plate 3, and sliding in the said block radially to the carrier. These guide-blocks are placed opposite to each other in the direction of the length of the cylinder and with the space between them equal to the width of the staple and are provided upon their inner surfaces with grooves 24 24', which are curved outwardly from a direction tangential to the circumference of the disks 9 10 to a direction radial thereof, as shown in Fig. 5. These blocks are provided with lugs 26, against which bear springs 27, pressing them outward, and their outward movement is limited by the contact of lugs 28 with the surface 29 of recesses in blocks 23.

In the normal position of the guide-blocks 21 22 when the same are pressed outward by the springs 27 the guiding-slots 24 24' register with the space between the strip or spring 19 and the disks 9 and 10, so that as the shoulder 18 revolves it will push the staple into the slots, as shown in Fig. 5. As the guide-

blocks come to the staple-setting point they are pushed in by the surface of carrier B against the pressure of springs 27 to the position shown in Fig. 2, the disks 9 10 being provided with the recesses 31 to permit this inward movement. The disk 14 is provided just back of the shoulder 18 with a gradually-elevated portion 32, which serves to lift the staple by bearing against its crown after the staple has passed into the guiding-slots 24 24', as shown in Fig. 2, the rear portion of which acts as a setting-bed for the staple. The rear part of this projection 32 is made with side flanges 33, giving the bearing-surface a width equal to the total width of the staple, so that the whole of the central portion of the staple will be supported while it is being set. The plates 3 are recessed, as shown in Figs. 11 and 12, to permit these flanges to pass as they rotate.

The staple-leg-clenching anvil-block 34, Fig. 14, is mounted upon a plate 35, which is held to the carrier by set-screws 36 37 and is adjusted by loosening these screws and turning the eccentric screw-bolt 38.

What I claim is—

1. The combination in a staple forming and setting mechanism, of a stationary anvil, a moving bender, and means for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.
2. The combination in a staple forming and setting mechanism, of a stationary anvil, a moving bender, and cam-like surfaces for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.
3. The combination in a staple forming and setting mechanism, of a stationary anvil, a moving bender, spaces being provided between the anvil and bender for the reception of the staple-legs, and cam-like surfaces formed rearwardly of the bender and moving therewith to lift the formed staple over the anvil, substantially as described.
4. The combination in a staple forming and setting mechanism, of a stationary anvil made in two parts, a moving bender, also made in two parts, and a cam-like surface between the parts of the anvil and also between the parts of the bender, and moving with the bender for lifting the crown of the staple over the anvil, substantially as described.
5. The combination in a staple forming and setting mechanism, of a stationary anvil made in two parts, a moving bender, also made in two parts, a cam-like surface between the parts of the anvil and also between the parts of the bender, and cam-like surfaces rearwardly of the bender, all said cam-like surfaces moving with the bender and serving to lift the staple over the anvil, substantially as described.
6. The combination in a staple forming and setting mechanism, of a stationary anvil, a rotary bender, and means for lifting the

formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

7. The combination in a staple forming and setting mechanism, of a stationary anvil, a rotary bender, and cam-like surfaces for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

8. The combination in a staple forming and setting mechanism, of a stationary anvil, a rotary bender, spaces being provided between the anvil and bender for the reception of the staple-legs, and cam-like surfaces formed rearwardly of the bender and moving therewith to lift the formed staple over the anvil, substantially as described.

9. The combination in a staple forming and setting mechanism, of a stationary anvil made in two parts, a rotary bender, also made in two parts, and a cam-like surface between the parts of the anvil and also between the parts of the bender, and moving with the bender for lifting the crown of the staple over the anvil, substantially as described.

10. The combination in a staple forming and setting mechanism, of a stationary anvil made in two parts, a rotary bender, also made in two parts, a cam-like surface between the parts of the anvil and also between the parts of the bender, and cam-like surfaces rearwardly of the bender, all said cam-like surfaces moving with the bender and serving to lift the staple over the anvil, substantially as described.

11. The combination, in a staple forming and setting mechanism, of a stationary anvil, a rotary bender, means for lifting the formed staple over the anvil, means for carrying the staple forward to the setting-point, and means for supporting the staple-crown while being set, substantially as described.

12. The combination in a staple forming and setting mechanism, of a stationary anvil, a rotary bender, means for lifting the formed staple over the anvil, means for carrying the staple forward to the setting-point, and means for supporting the staple-legs while being set, substantially as described.

13. The combination in a staple forming and setting mechanism, of a stationary anvil, a rotary bender, a raised moving surface or surfaces to lift the formed staple over the anvil, and a rotating part adapted to engage with the staple and carry it forward to the setting-point, substantially as described.

14. The combination of means for presenting the staple at the setting-point, and a moving setting-bed which moves forward laterally with reference to the staple while the latter is being driven, substantially as described.

15. The combination of a fixed anvil made in two parts, rotating staple-forming dies and a rotating cam-like surface between the parts of the anvil for lifting the crown of the staple over the anvil, substantially as described.

16. The combination of a fixed anvil made

in two parts, staple-forming dies and rotating cam-like surfaces between and at each side of said parts for lifting the staple over the anvil, substantially as described.

17. The combination of a rotary carrier having mounted therein staple-forming mechanism, mechanism for conveying the formed staple to the setting-point rotating within the carrier, and a cam-like moving surface or surfaces for moving the staple after it is formed so that it shall come within the control of the conveying mechanism, substantially as described.

18. A rotary carrier having mounted thereon a stationary stapling-anvil, a moving bender, and means for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

19. A rotary carrier having mounted thereon a stationary stapling-anvil, a moving bender, and cam-like surfaces for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

20. A rotary carrier having mounted thereon, a stationary stapling-anvil, a rotary bender, and means for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

21. A rotary carrier having mounted thereon a stationary stapling-anvil, a rotary bender, and cam-like surfaces for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

22. A rotary carrier having mounted thereon a stationary stapling-anvil, a rotary bender, spaces being provided between the anvil and bender for the reception of the staple-legs, and cam-like surfaces formed rearwardly of the bender and moving therewith to lift the formed staple over the anvil, substantially as described.

23. A rotary carrier having mounted thereon means for presenting the staple at the staple-setting point, and a moving setting-bed which moves forward laterally with reference to the staple while the latter is being driven, substantially as described.

24. The combination in a staple forming and setting mechanism, of means for feeding pliated material onward past staple-inserting means, a rotating carrier for presenting the staple to the point of insertion, an anvil mounted upon and fixed with reference to the carrier, a bender mounted upon and moving with reference to the carrier, and means for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

25. The combination in a staple forming and setting mechanism, of means for feeding pliated material onward past staple-inserting means, a rotating carrier for presenting the staple to the point of insertion, an anvil

mounted upon and fixed with reference to the carrier, a bender mounted upon and moving with reference to the carrier, and cam-like surfaces for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

26. The combination in a staple forming and setting mechanism, of means for feeding plicated material onward past staple-inserting means, a rotating carrier for presenting the staple to the point of insertion, an anvil mounted upon and fixed with reference to the carrier, a bender mounted upon and rotating with reference to the carrier, and means for lifting the formed staple over the anvil that it may be carried forward to the setting-point, substantially as described.

27. The combination in a staple forming and

setting mechanism, of means for feeding plicated material onward past staple-inserting means, a carrier rotating to present the staple to the point of insertion, an anvil mounted upon and fixed with reference to the carrier, a moving bender, a raised moving surface or surfaces for lifting the formed staple over the anvil, and a rotating part adapted to engage with the staple and carry it forward to the setting-point, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LUTHER C. CROWELL.

Witnesses:

T. F. KEHOE,
N. MAGUIRE.