

No. 615,254.

Patented Dec. 6, 1898.

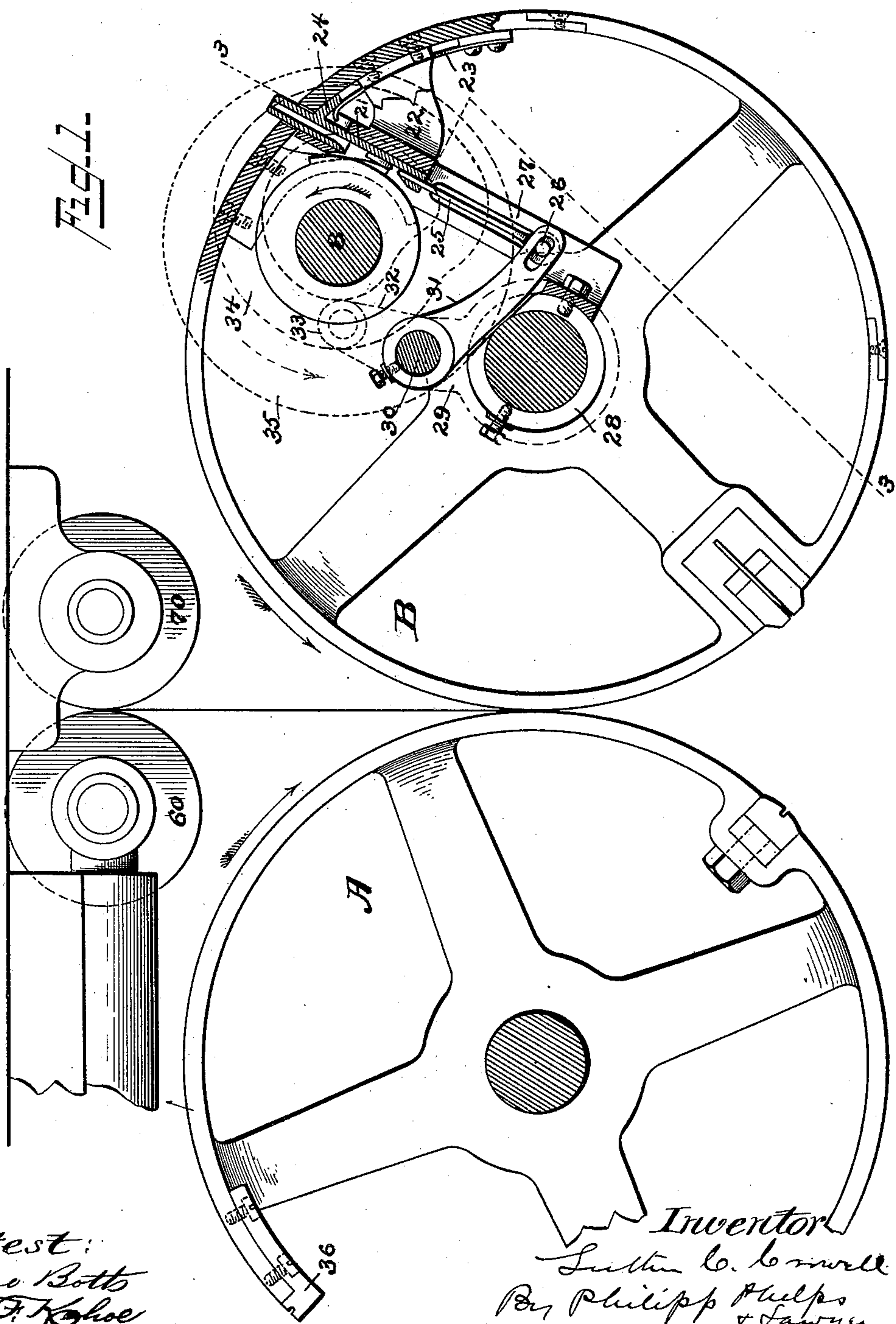
L. C. CROWELL.

STAPLE BINDING DELIVERY MECHANISM FOR PRINTING MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.)

5 Sheets—Sheet 1.



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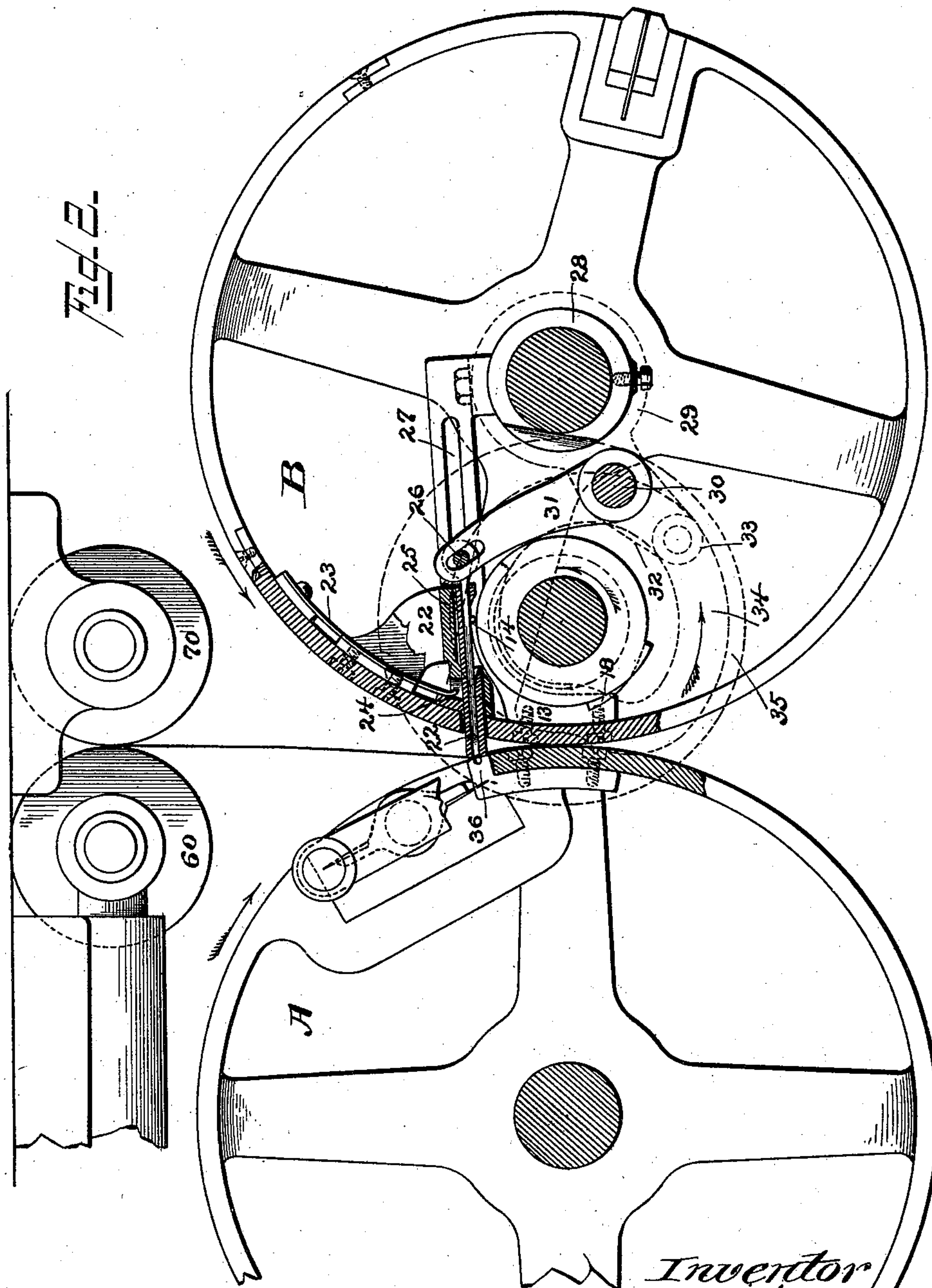
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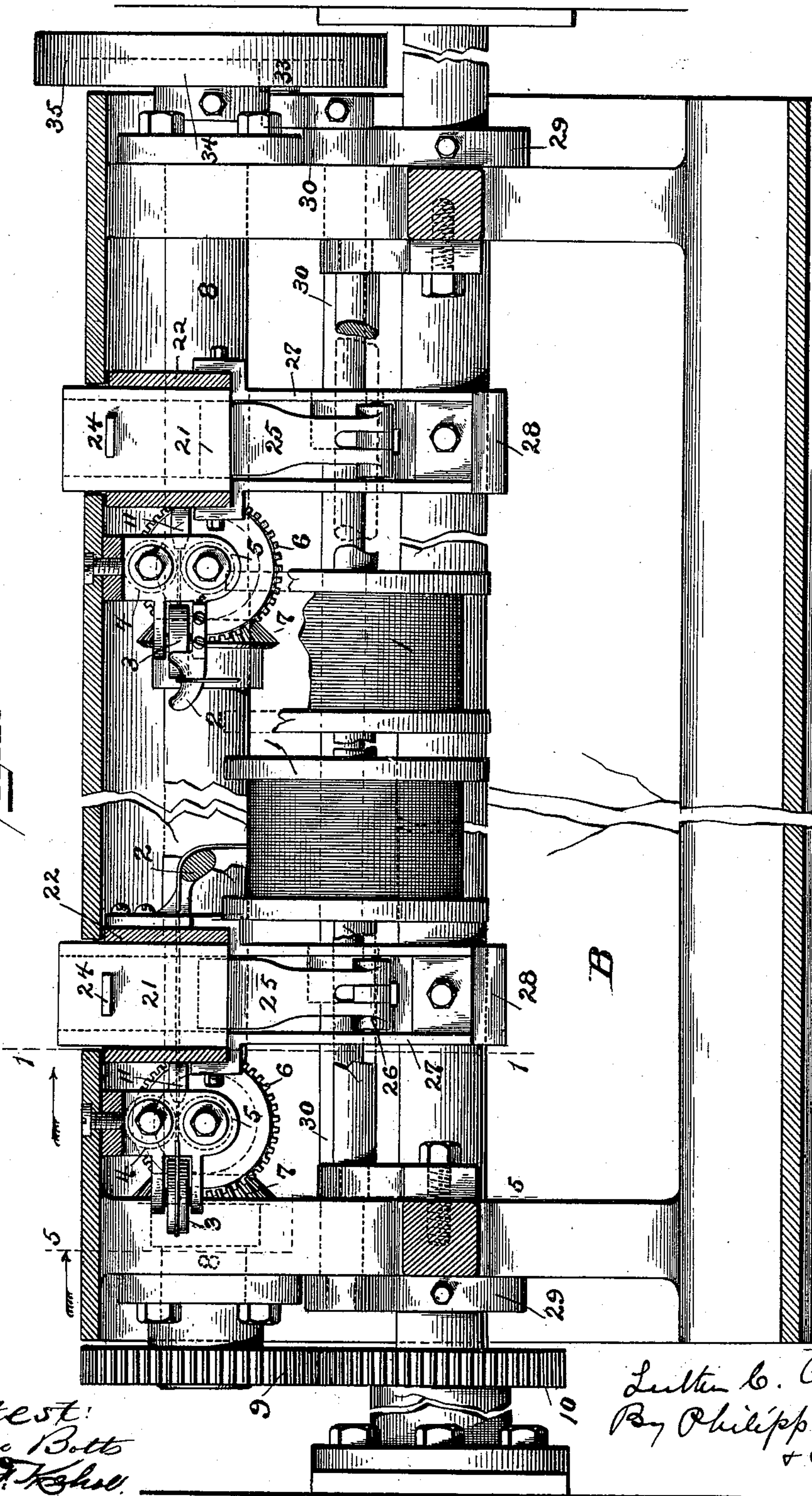
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Fig. 3.



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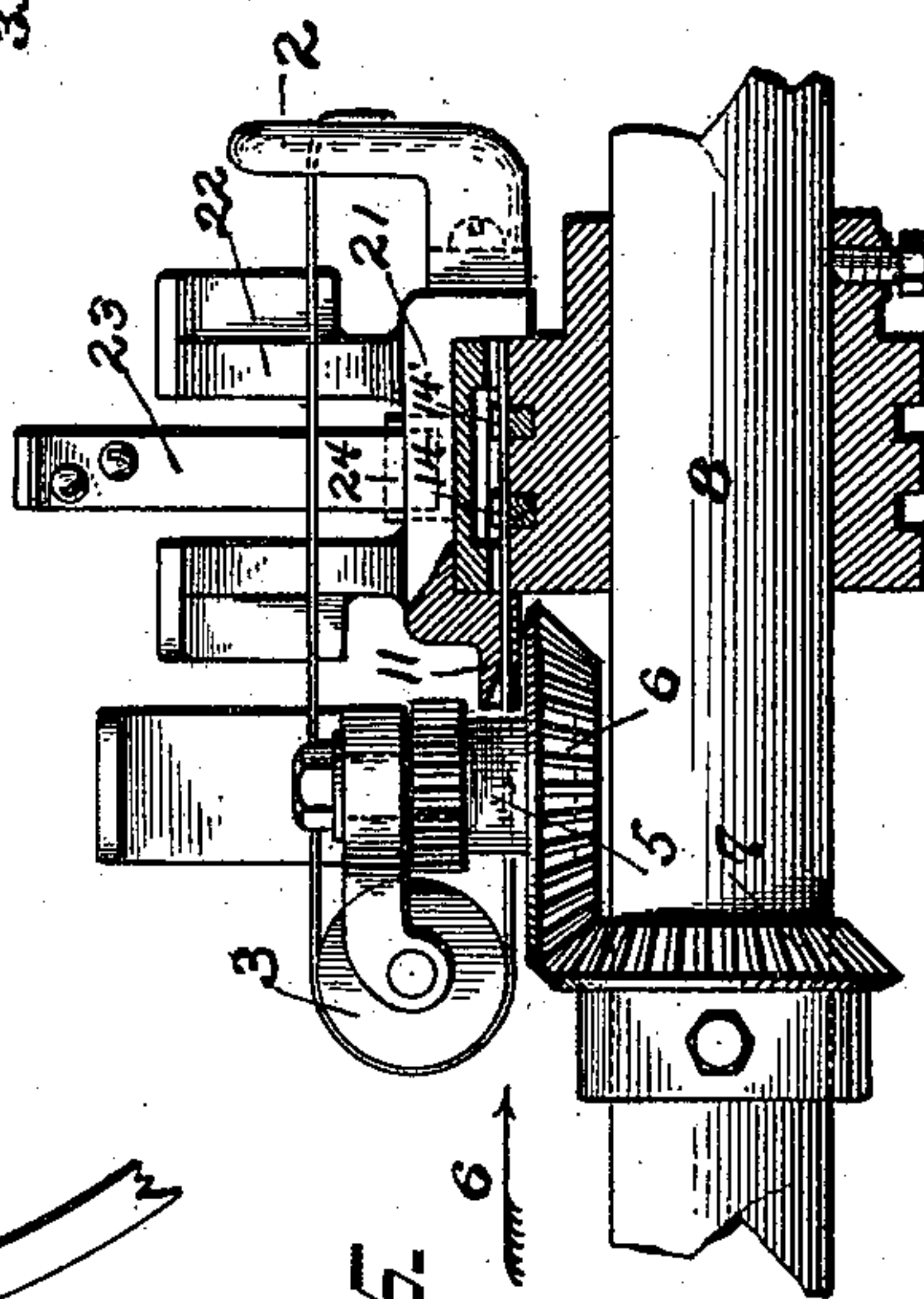
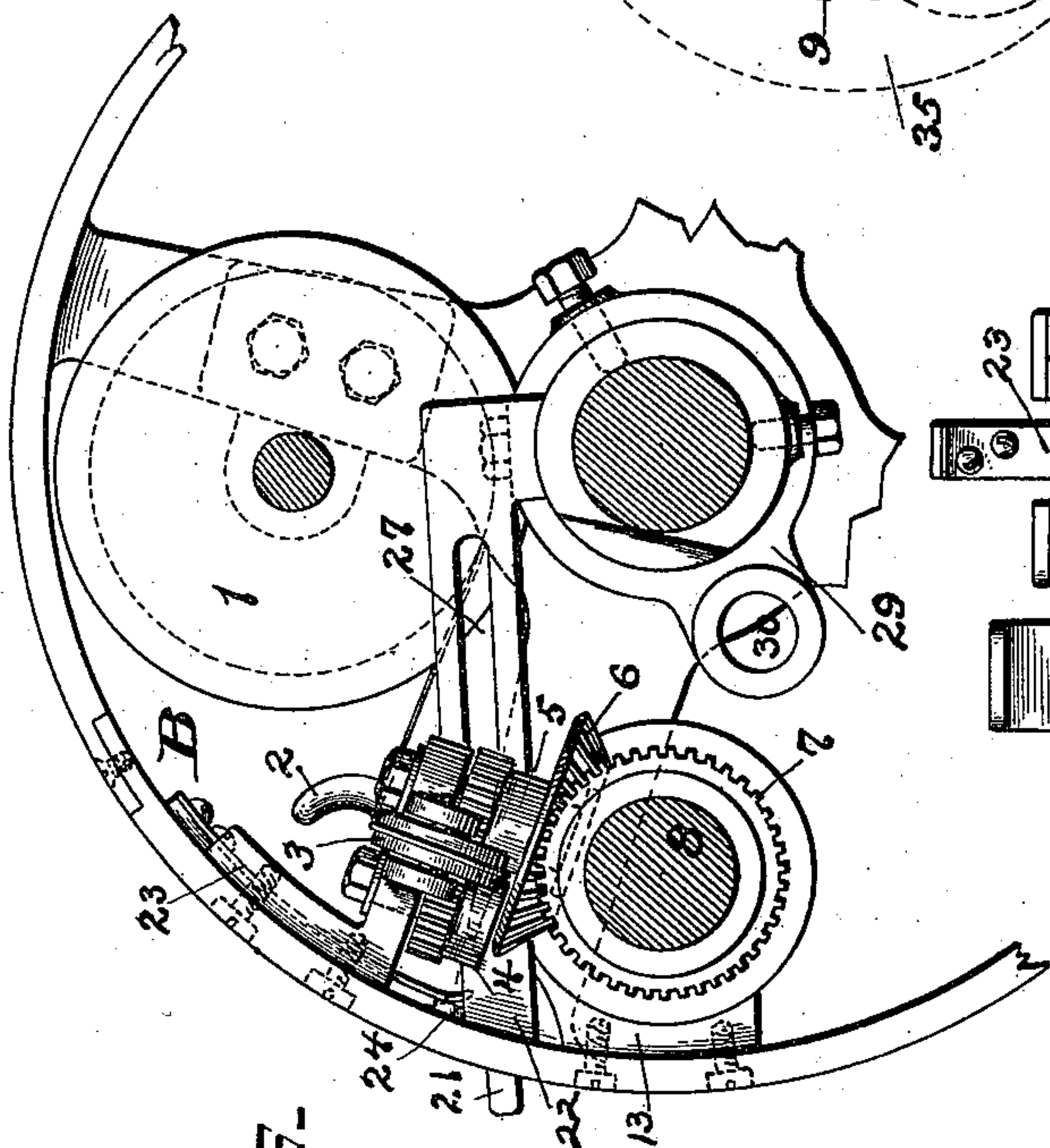
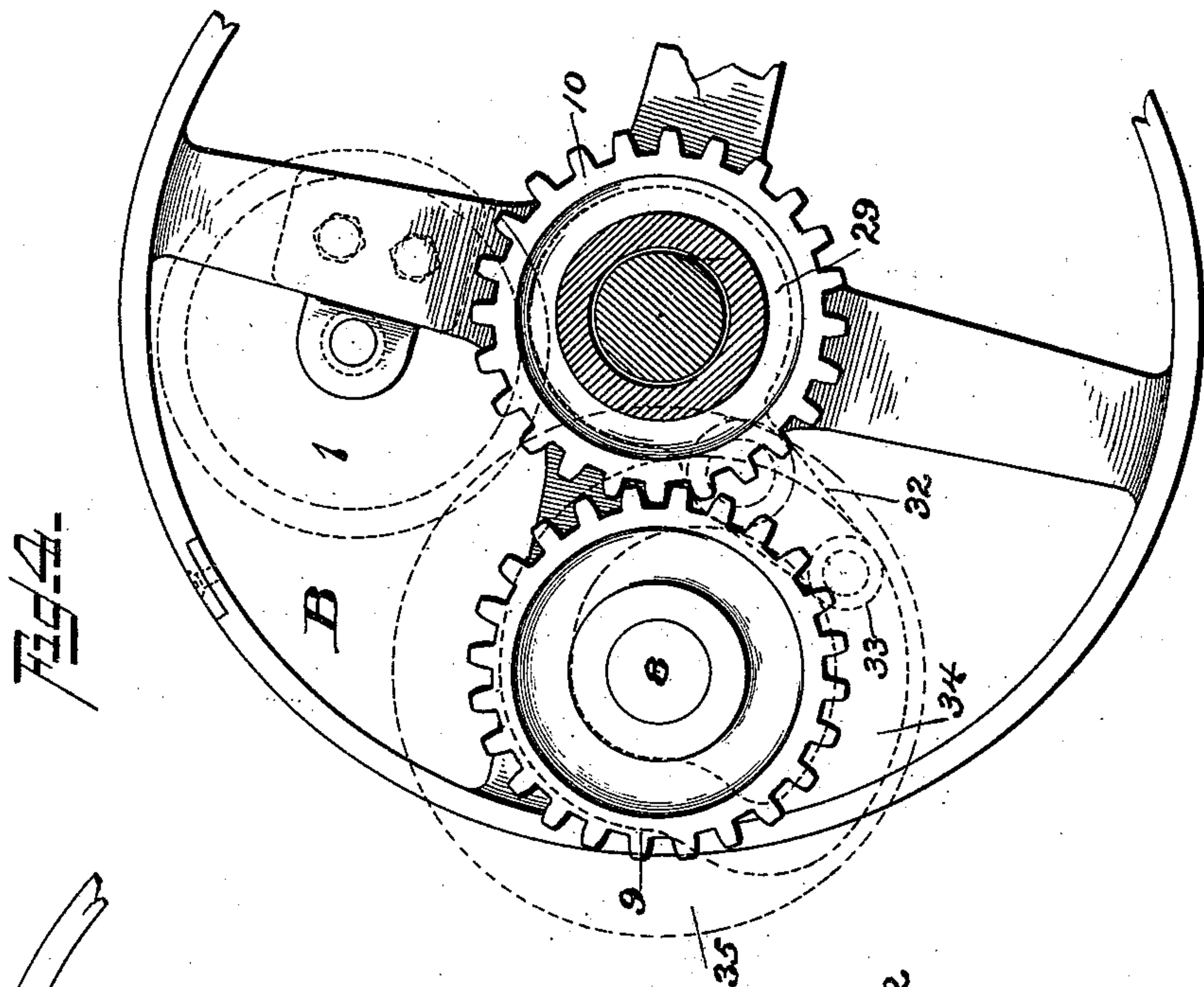
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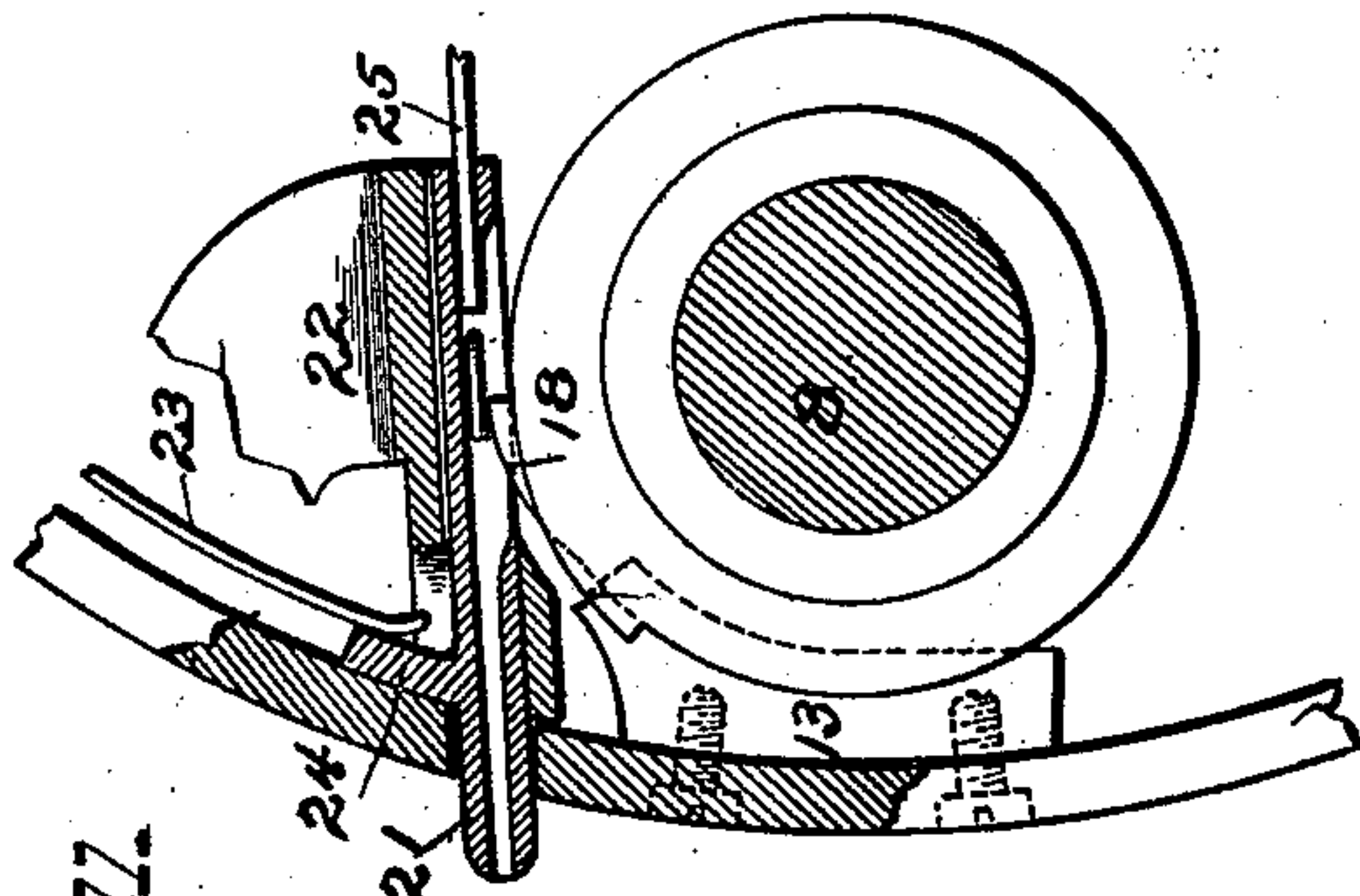


Fig. 10.

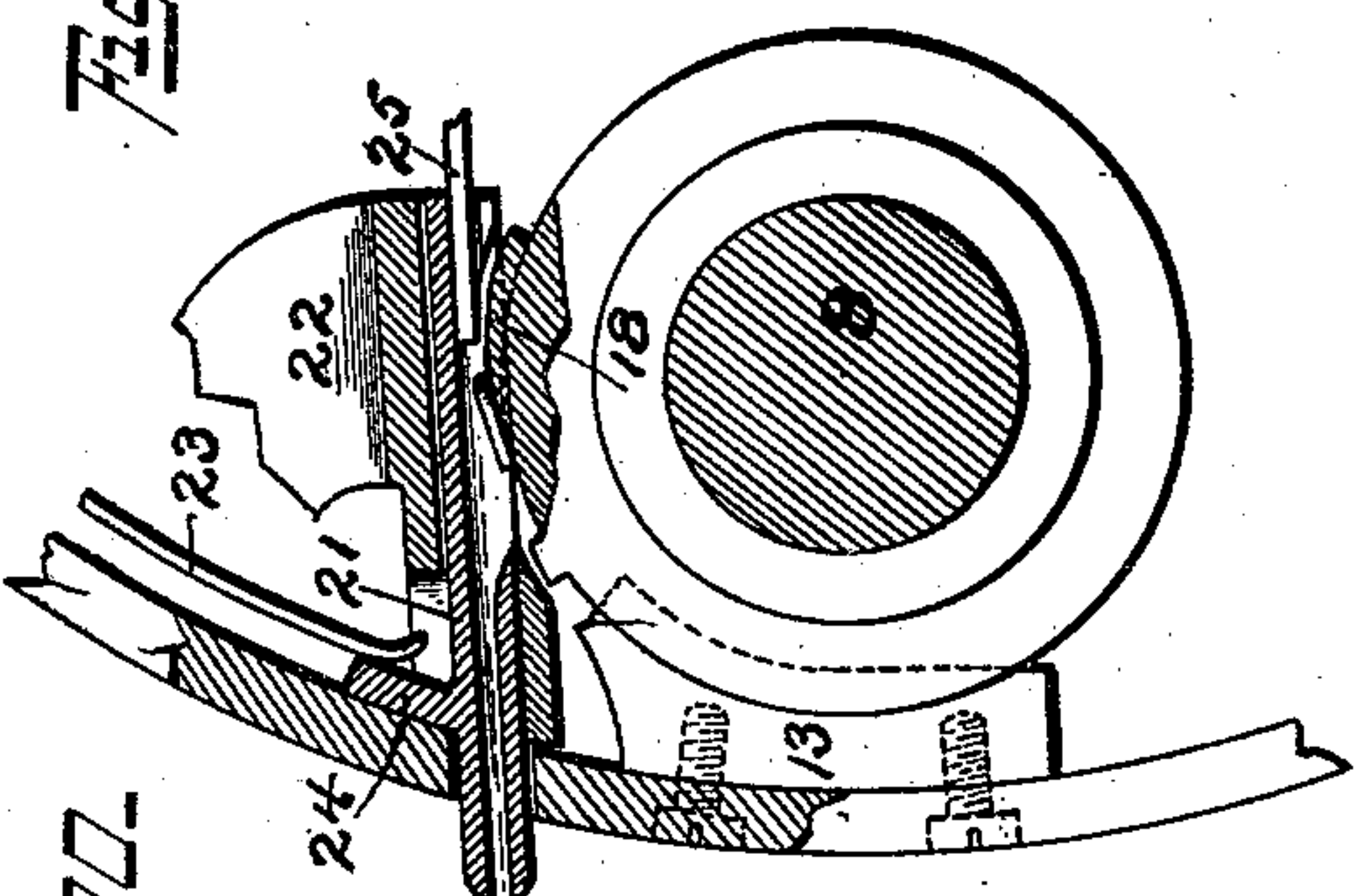


Fig. 11.

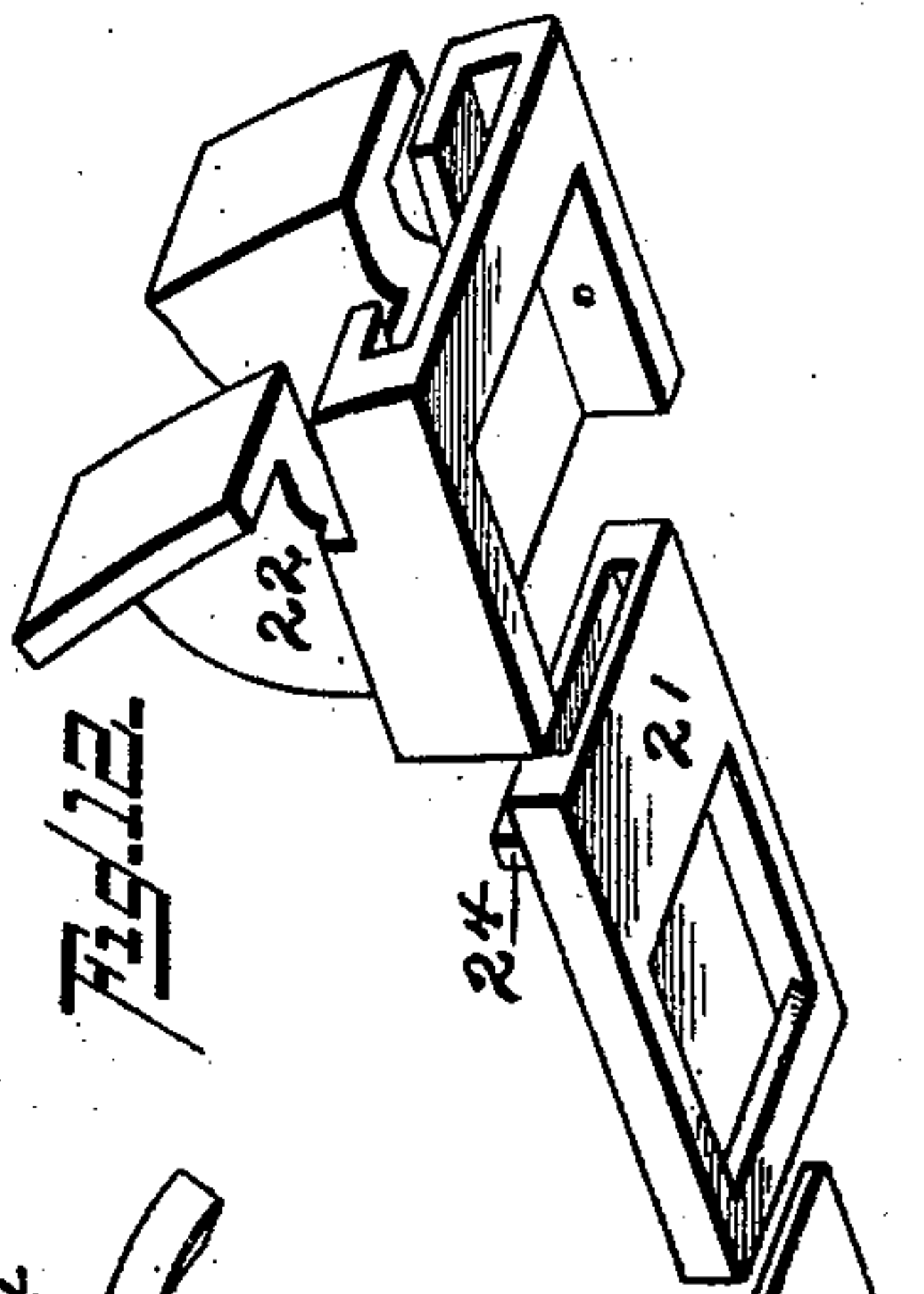


Fig. 12.

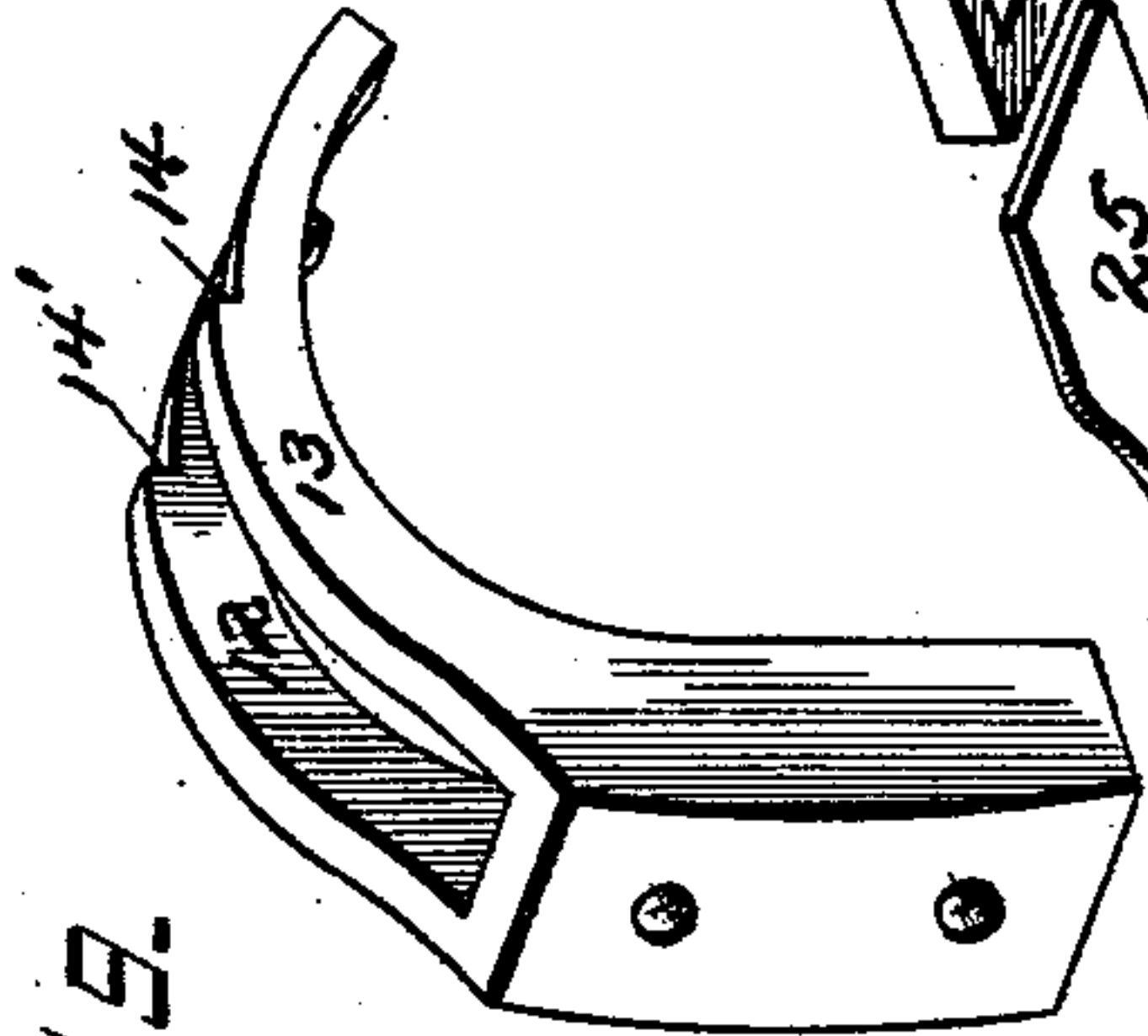


Fig. 13.

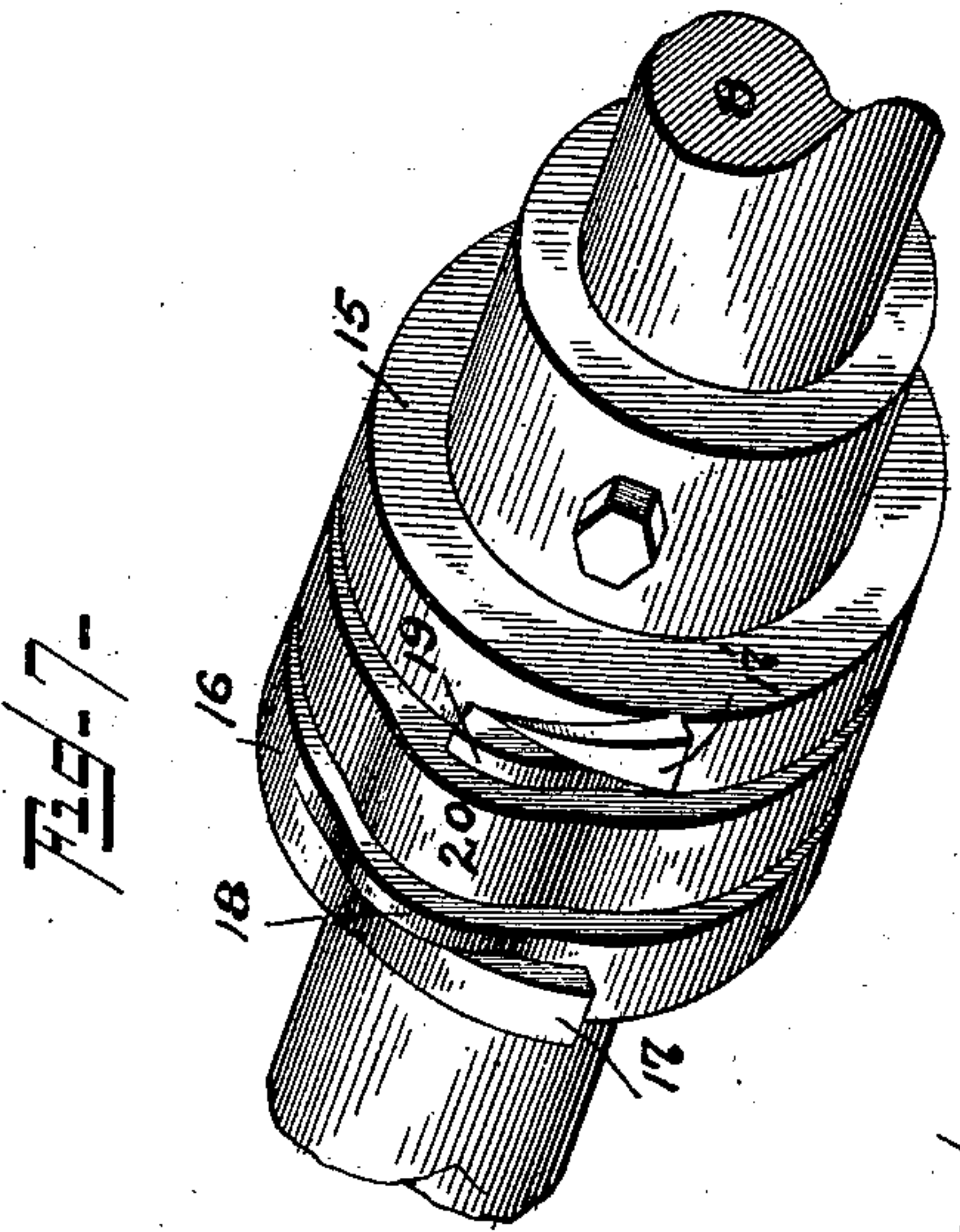


Fig. 14.

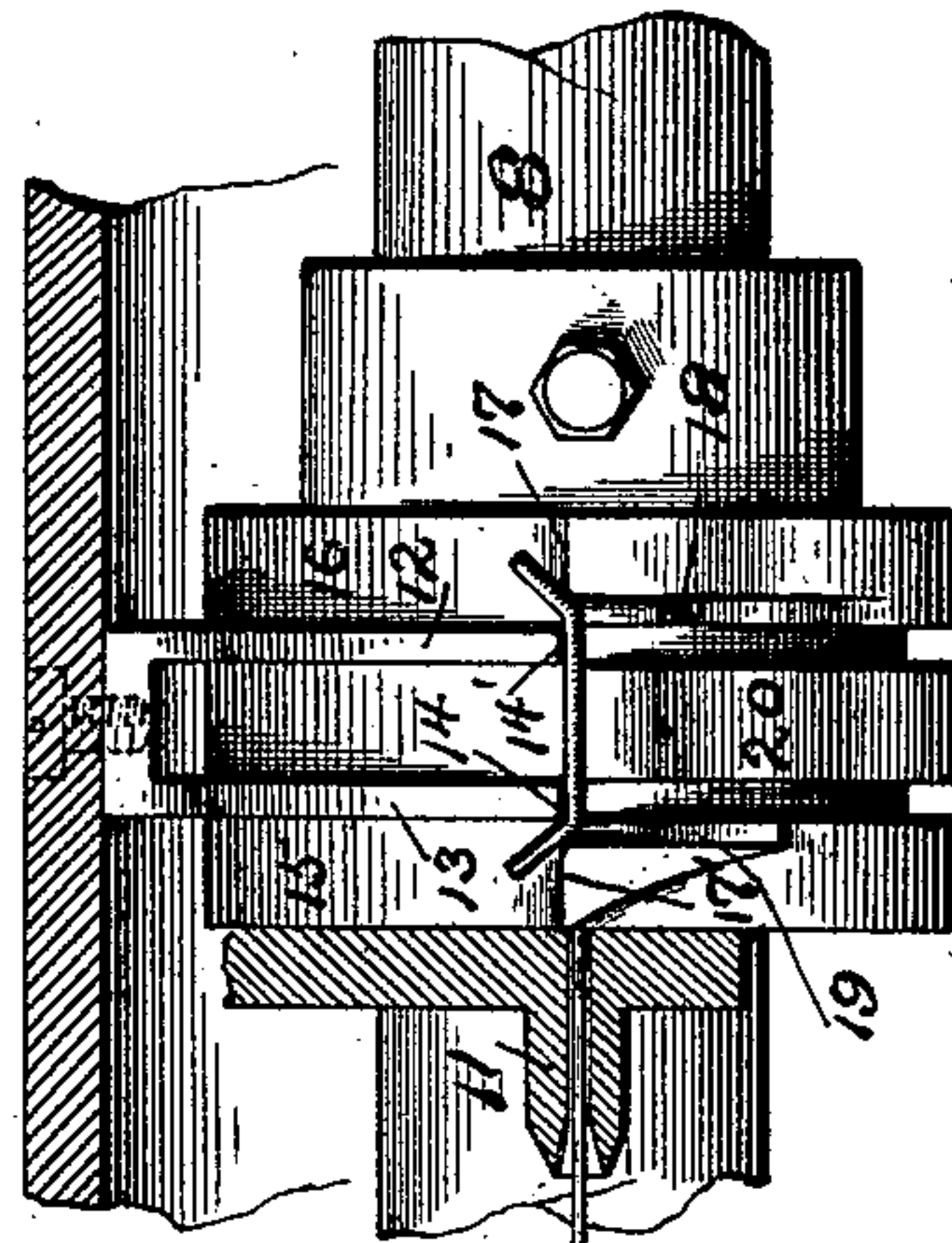


Fig. 15.

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# UNITED STATES PATENT OFFICE.

LUTHER C. CROWELL, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE,  
THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF SAME PLACE.

## STAPLE-BINDING DELIVERY MECHANISM FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 615,254, dated December 6, 1898.

Application filed December 31, 1897. Serial No. 665,166. (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 pliated 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 pliated 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 especially 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, Figure 1 is a sectional view of the carrier for the stapling mechanism on the line 1 1 of Fig. 3. Fig. 2 is a similar view of the parts in different positions. Fig. 3 is a longitudinal view of the carrier for the stapling mechanism on the line 3 3 of Fig. 1. Fig. 4 is an end view of the carrier for the stapling mechanism. Fig. 5 is a sectional view on the line 5 5 of Fig. 3. Fig. 6 is an elevation of the wire-feeding mechanism, the point of view being indicated by the arrow 6 in Fig. 5. Fig. 7 is a view of the staple-bending dies detached. Fig. 8 is a view of the anvil and bending-dies in the act of forming a staple, the point of view being on the opposite side of the shaft from that of

Fig. 7. Fig. 9 shows the arms, of which the shoulders constitute the anvil. Fig. 10 is a partial section similar to that of Fig. 1, showing the position of the parts directly after the formation of the staple. Fig. 11 is a similar view showing the position of the parts after the staple has been lifted above the anvil, and Fig. 12 is a detail of the staple-presenting tool. Figs. 7 to 12 are on an enlarged scale.

The paper to be stapled is led to the stapling mechanism from any mechanism suitable to prepare the paper which is to be stapled. In the drawings, 60 70 represent the delivery-rolls of any such mechanism, the preferable mechanism for the purpose being a longitudinal folder of the type set forth in my Patent No. 331,280. The paper may, however, be presented to the stapling mechanism in the form of sheets, if desired, though in my opinion the web form is preferable.

The paper to be folded passes between two carriers A and B, one of which carries mechanism for forming and presenting staples and the other carries clenching-dies cooperating therewith; but the clenching-dies may be stationary, if desired.

The carrier B is preferably provided with a number of stapling mechanisms spaced along its length in order to form in the paper a transverse seam made up of a number of staples. These mechanisms are similar and a description of one of them will therefore suffice for all, and it will therefore be understood that the description which will be given applies equally to all these mechanisms, although the parts are for convenience referred to in the singular number instead of in the plural.

From the wire-spools 1, mounted in the carrier, the wire passes to a fixed guide 2, and thence over a roller-guide 3, thence between the feed-disks 4 5, which gear together and one of which, 5, carries on its shaft a bevel-gear 6, which meshes with a second bevel-gear 7 upon the shaft 8 of the stapling mechanism, which shaft has on its outer end, beyond the cylinder, a gear-wheel 9, which engages with a fixed gear 10 and is given a rotary motion thereby as the cylinder revolves. The



wire passes from the feed-disks to the fixed guide 11, (see Fig. 5,) through which it passes to the anvil. The latter consists of arms 12 and 13, fixed to the cylinder and provided with shoulders 14 14', which serve as an anvil. The staple-bender is formed of two bending-dies 15 16, which are rotary and mounted on shaft 8 and are placed just outside of the arms 12 13, and are provided with shoulders 17 17', which coact with the shoulders 14 14' to form a staple, as shown in Fig. 8. After the staple is formed the legs of the staple will lie in spaces provided for them between the arms 12 13 and the shoulders 17 17'. In order to provide for lifting the formed staple over the anvil, in order that it may be carried to the place of setting, the bending-dies are provided with cam-like surfaces 18 19, which, as the bending-dies revolve, serve to elevate the staple to the position shown in Fig. 1. This elevation may, if desired, be secured by the action alone of the cam-like surfaces 18 19; but in order to insure the proper elevation of the crown of the staple it is desirable that the anvil should be made in two parts, as shown, with a cam-like surface 20 between them, which shall serve to positively lift the crown of the staple.

The means by which the staple is presented to the material to be stapled consists in the construction herein shown of the sheath or guide 21, supported by the bracket 22 and normally stationary with reference to the carrier and projecting outward through the shell of the carrier, as shown in Figs. 10 and 11, and held in its outward position by the pressure of a spring 23 against leg 24. This sheath is cut away below, so as to permit the staple to be introduced into it, and also to permit the clearance of the rotating bending-dies.

The staple when elevated by the cam-like surfaces on the bending-dies is forced forward by the driver 25 to the front end of the guide or sheath, assuming the position shown in Fig. 2. The driver is moved at proper times to carry the staple forward by a cross-head 26, moving in a slotted arm 27, attached at one end to the cylinder-shell and at the other end to a collar 28, mounted upon the cylinder-shaft. This cylinder-shaft carries at the cylinder ends collars 29, in which is journaled the shaft 30, which shaft has fixed upon it the arms 31 and 32. The arm 31 engages, by means of a slot, the cross-head 26 and gives the proper movements to the driver as it is moved by a cam-roll 33 on arm 32, engaging with the path-cam 34 in the cam-plate 35, fixed to the shaft 8.

As stated above, when the staple is about to be driven the parts assume the position shown in Fig. 2, and as the staple is carried to the position in which the carriers A and B are in close proximity to each other the staple is forced through the material by the proximation of the cylinders, it being held from retracting by the driver. At the same time

the guide or sheath 21 is forced back against the spring 23 by the carrier A until at the moment of clenching the staple its outer end is flush with the carrier B. The legs of the staple are clenched by the clenching-die 36.

What I claim is—

1. The combination of staple-forming mechanism having rotary motion, a staple-holding sheath or guide, and a cam-like moving surface or surfaces for lifting the formed staple from the forming mechanism into the guide, substantially as described.

2. The combination of staple-forming mechanism having rotary motion, a staple-holding sheath or guide placed tangentially with reference to the path of the rotating forming mechanism and having its wall cut away to permit the passage of said mechanism, and a cam-like moving surface or surfaces for lifting the formed staple from the forming mechanism into the guide, substantially as described.

3. The combination of staple-forming mechanism having rotary motion, a staple-holding sheath or guide, cam-like moving surfaces for lifting the formed staple from the forming mechanism into the guide, and means for advancing the staple in the guide to the setting-point, substantially as described.

4. The combination of staple-forming mechanism having rotary motion, a staple-holding sheath or guide, cam-like moving surfaces for lifting the formed staple from the forming mechanism into the guide, and a reciprocating plunger for advancing the staple to the setting-point, substantially as described.

5. The combination of staple-forming mechanism having rotary motion, a staple-holding sheath or guide placed tangentially with reference to the path of the rotating forming mechanism and having its wall cut away to permit the passage of said mechanism, a cam-like moving surface or surfaces for lifting the formed staple from the forming mechanism into the guide, and means for advancing the staple in the guide to the setting-point, substantially as described.

6. The combination of staple-forming mechanism having rotary motion, a staple-holding sheath or guide placed tangentially with reference to the path of the rotating forming mechanism and having its wall cut away to permit the passage of said mechanism, a cam-like moving surface or surfaces for lifting the formed staple from the forming mechanism into the guide, and a reciprocating plunger for advancing the staple to the setting-point, substantially as described.

7. The combination of a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, and means for lifting the formed staple over the anvil and into the guide, substantially as described.

8. The combination of a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, means for lifting the formed staple over the anvil and into the guide, and means



for advancing the staple in the guide to the setting-point, substantially as described.

9. The combination of a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, means for lifting the formed staple over the anvil and into the guide, and a reciprocating plunger for advancing the staple in the guide to the setting-point, substantially as described.

10. The combination of a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, the wall of the guide being cut away and the anvil being placed in immediate juxtaposition with the path of the staple, and means for lifting the formed staple over the anvil into position to be forced forward in the guide, substantially as described.

11. The combination of a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, and a cam-like moving surface or surfaces for lifting the formed staple over the anvil and into the guide, substantially as described.

12. The combination of a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, a cam-like moving surface or surfaces for lifting the formed staple over the anvil and into the guide, and means for advancing the staple in the guide to the setting-point, substantially as described.

13. A rotary carrier having mounted thereon a staple-forming mechanism having rotary motion, a staple-holding sheath or guide, and cam-like moving surfaces for lifting the formed staple from the forming mechanism into the guide, substantially as described.

14. A rotary carrier having mounted thereon a staple-forming mechanism having rotary motion, a staple-holding sheath or guide, cam-like moving surfaces for lifting the formed staple from the forming mechanism into the guide, and means for advancing the staple in the guide to the setting-point, substantially as described.

15. The combination of a rotary carrier having mounted thereon a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, and means for lifting the formed staple over the anvil and into the guide, substantially as described.

16. The combination of a rotary carrier having mounted thereon a fixed anvil, a rotating staple-bender, a sheath or guide for the staple, means for lifting the formed staple over the anvil and into the guide, and means for

advancing the staple in the guide to the setting-point, substantially as described.

17. 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, a staple-forming mechanism having rotary motion with reference to the carrier, a staple-holding sheath or guide, and cam-like moving surfaces for lifting the formed staple from the forming mechanism into the guide, substantially as described.

18. 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, a staple-forming mechanism having rotary motion with reference to the carrier, a staple-holding sheath or guide, cam-like moving surfaces for lifting the formed staple from the forming mechanism into the guide, and means for advancing the staple in the guide to the setting-point, substantially as described.

19. 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 fixed with reference to the carrier, a staple-bender rotating with reference to the carrier, a sheath or guide for the staple, and means for lifting the formed staple over the anvil and into the guide, substantially as described.

20. 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 fixed with reference to the carrier, a staple-bender rotating with reference to the carrier, a sheath or guide for the staple, means for lifting the formed staple over the anvil and into the guide, and means for advancing the staple in the guide 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.