

D. APPEL & J. MATHES.
Paper Bag-Machines.

No. 153,295.

Patented July 21, 1874.

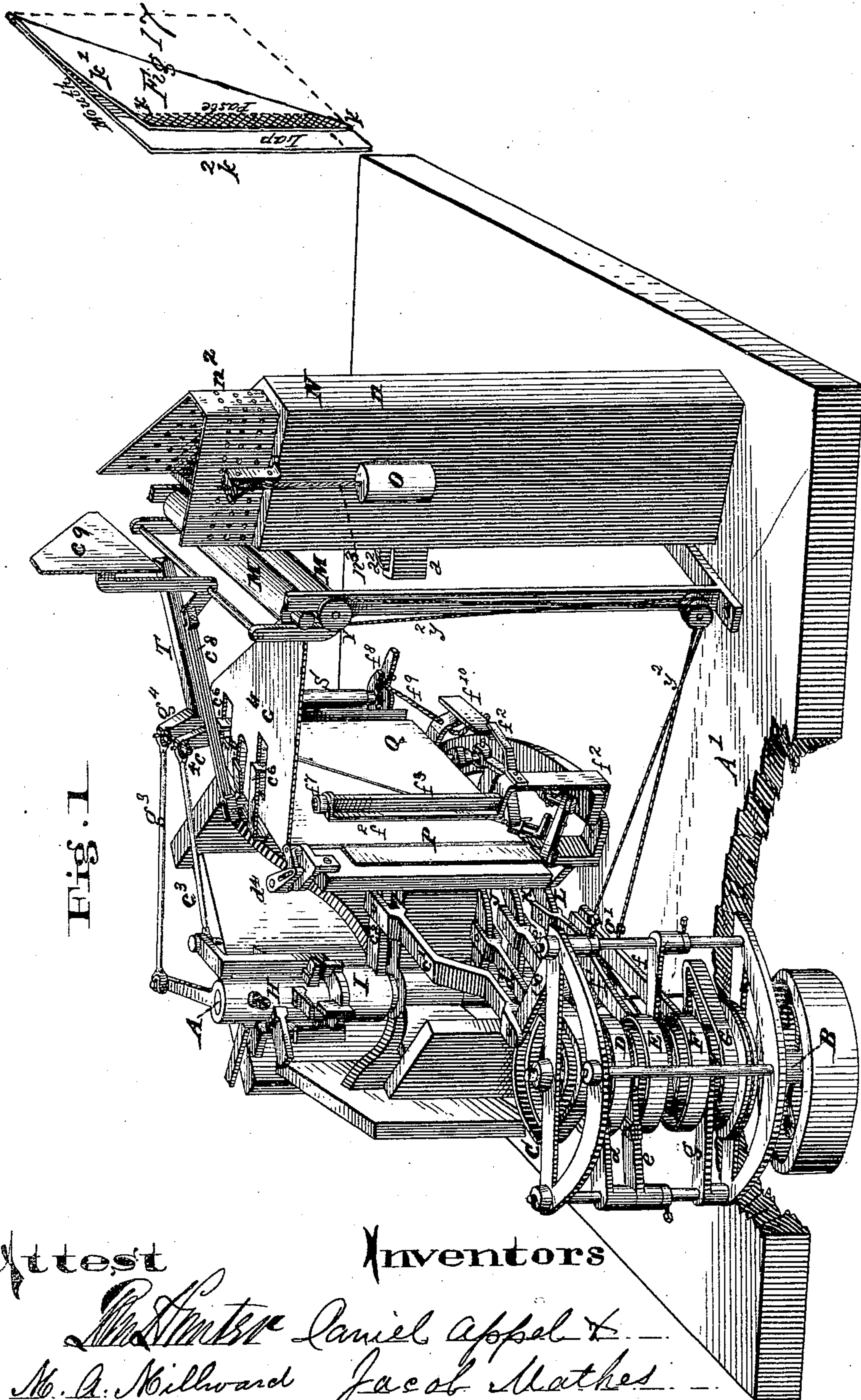


Fig. 1

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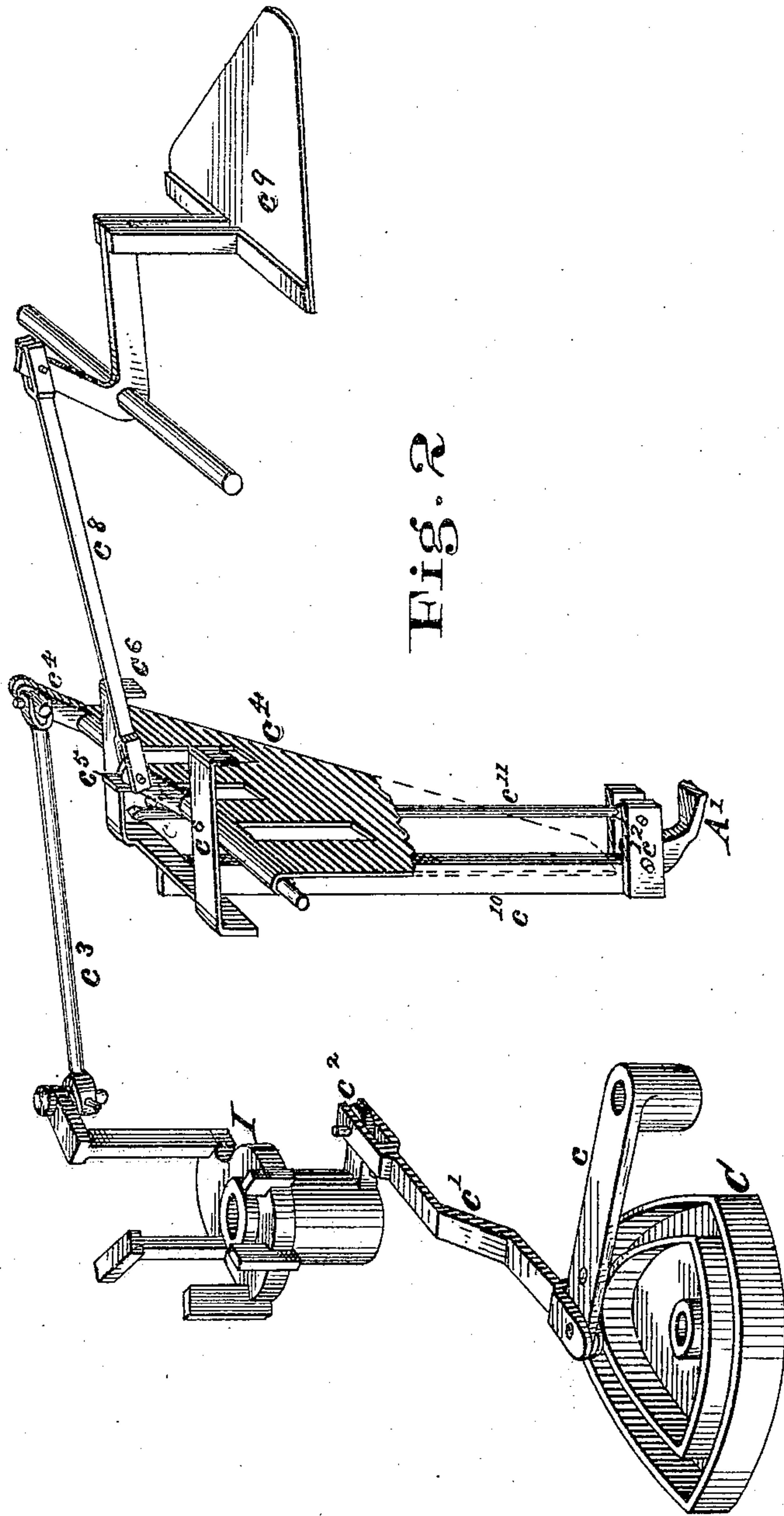
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Fig. 11

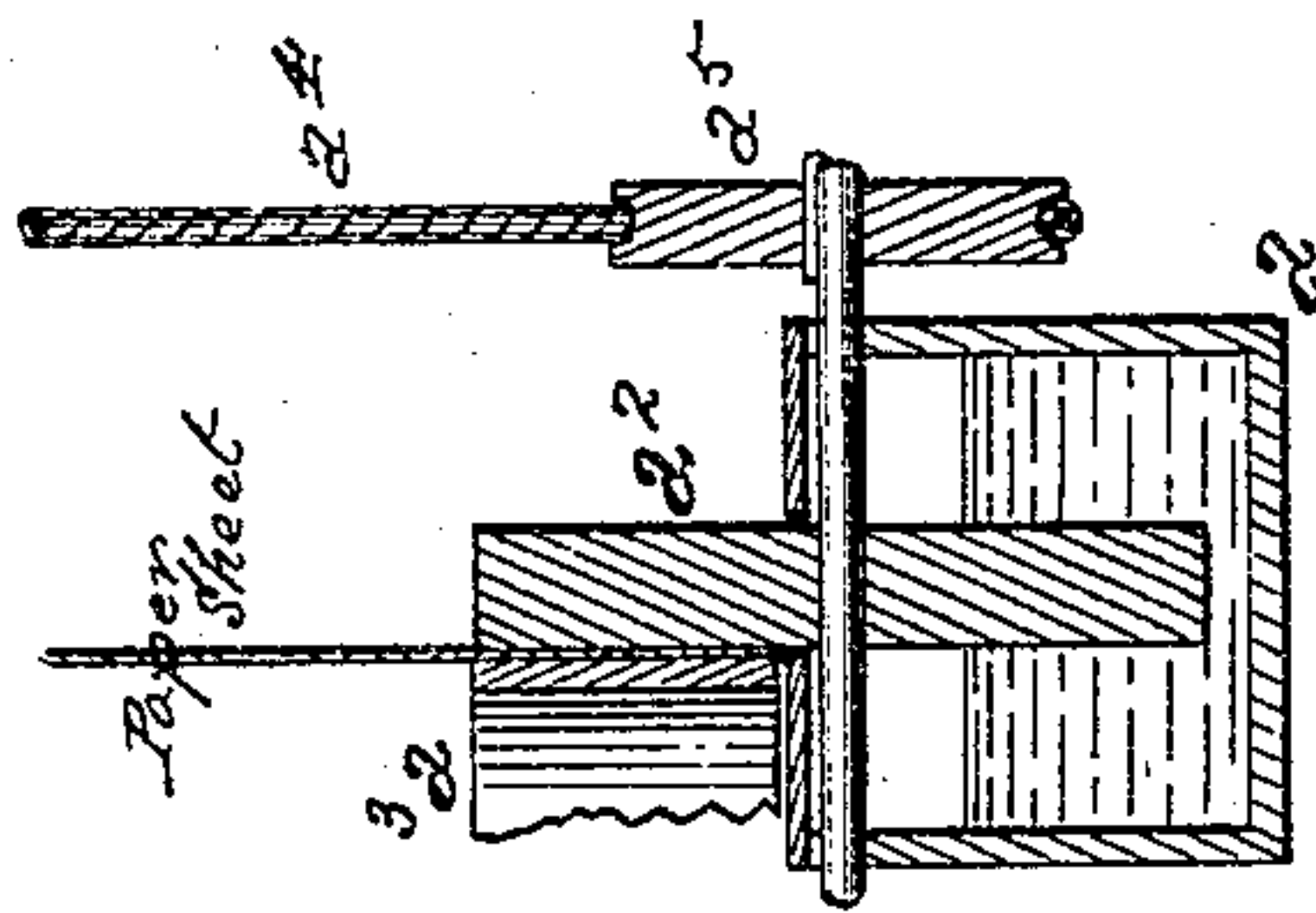
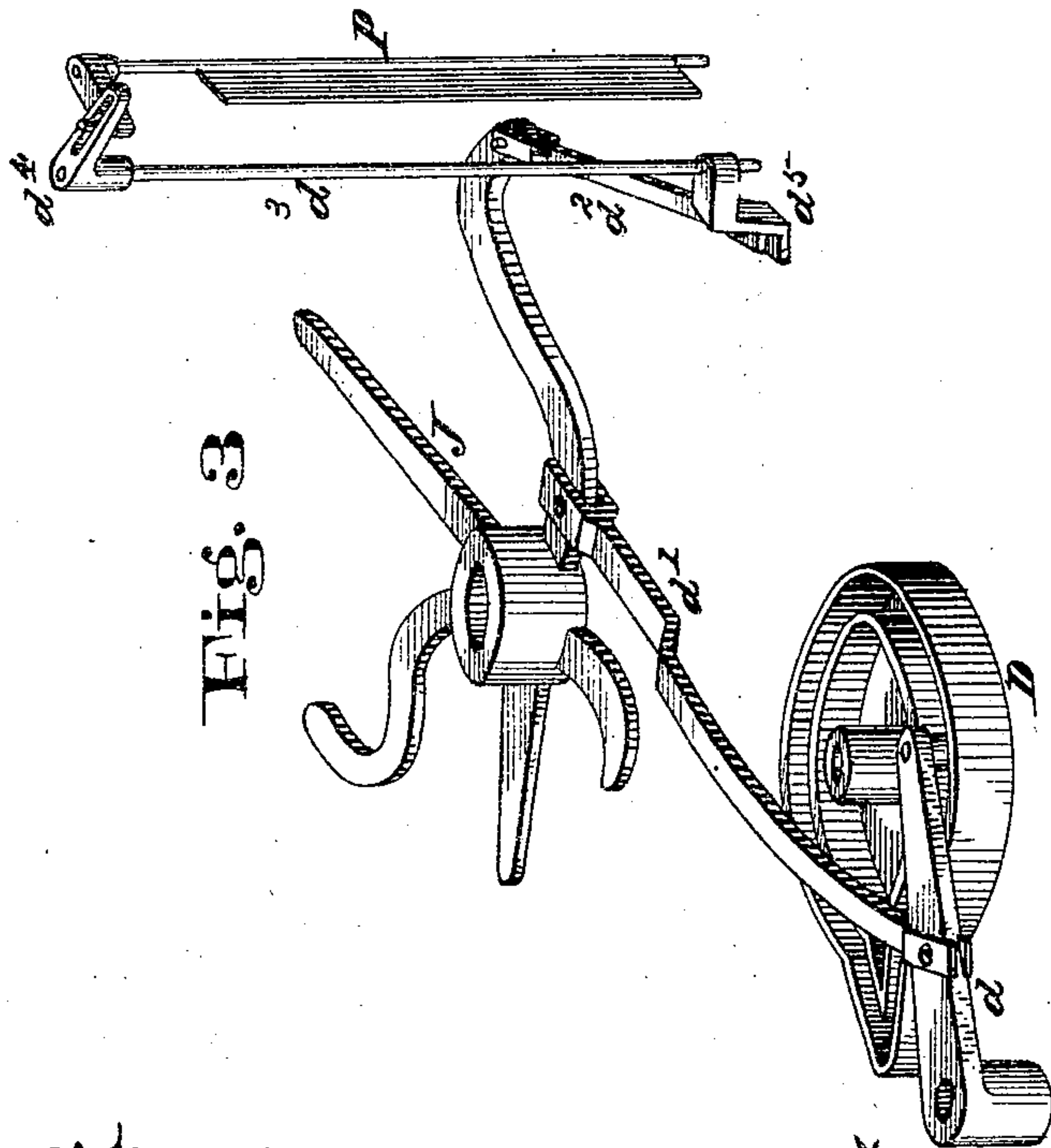


Fig. 3



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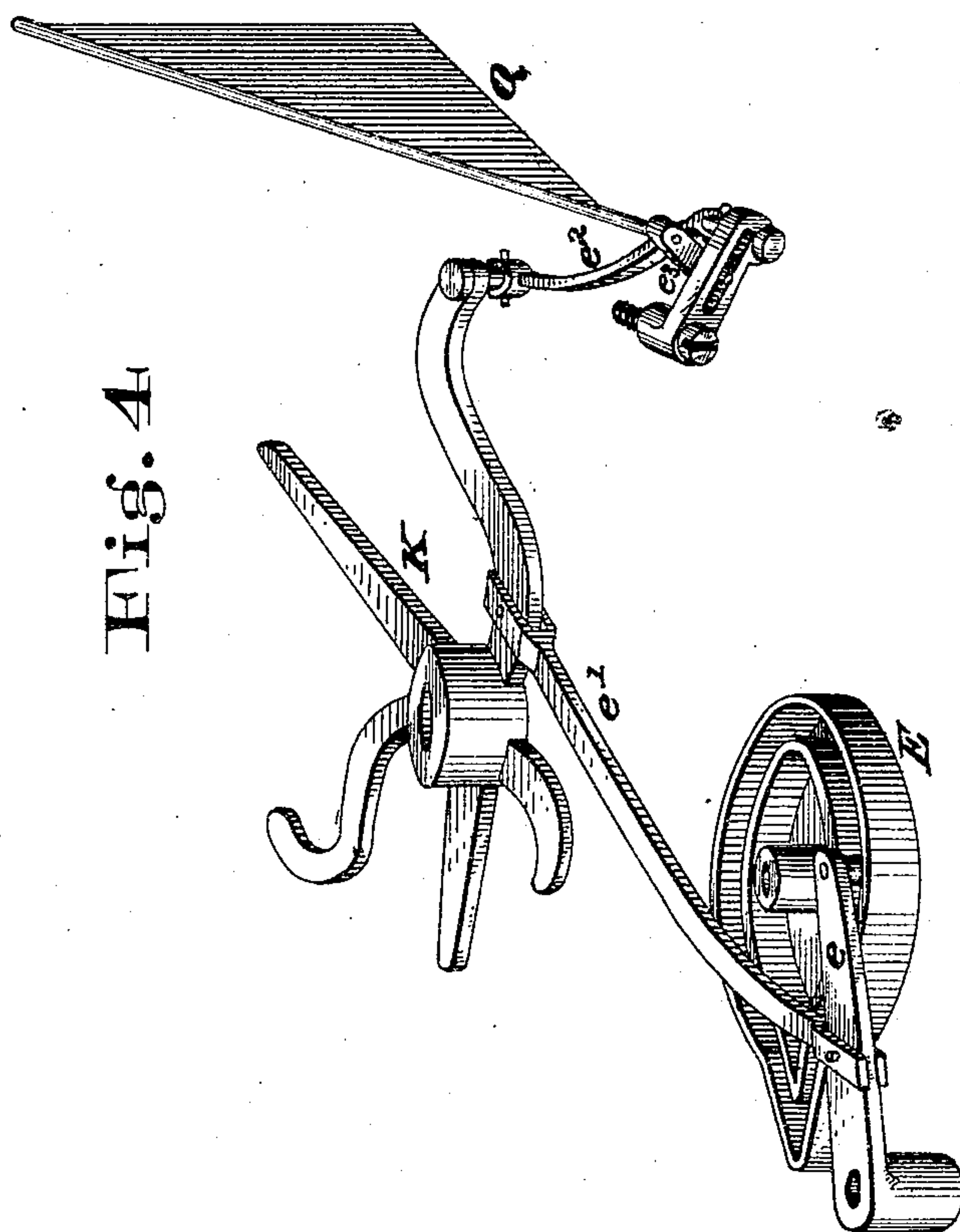


Fig. 4

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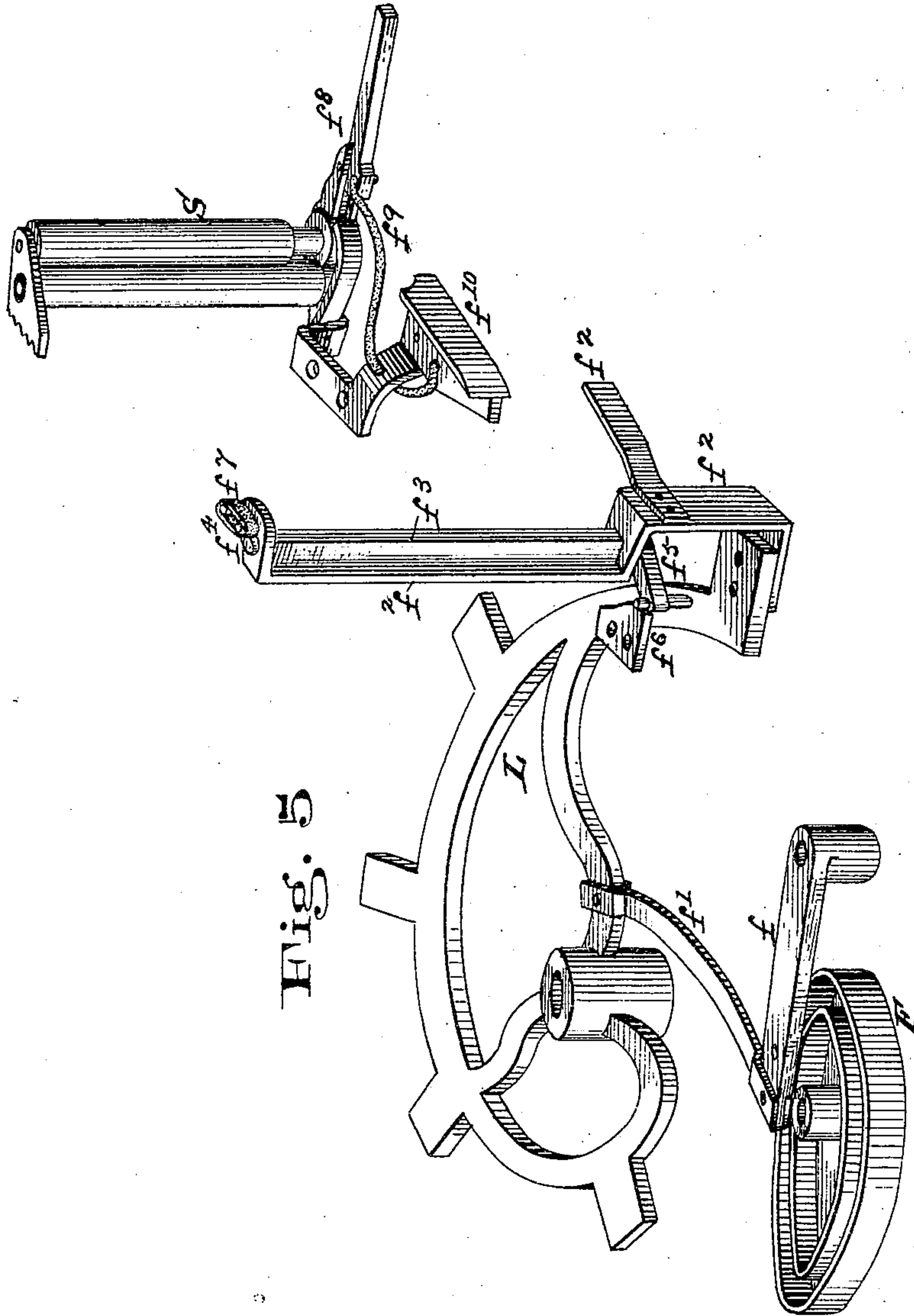


Fig. 5

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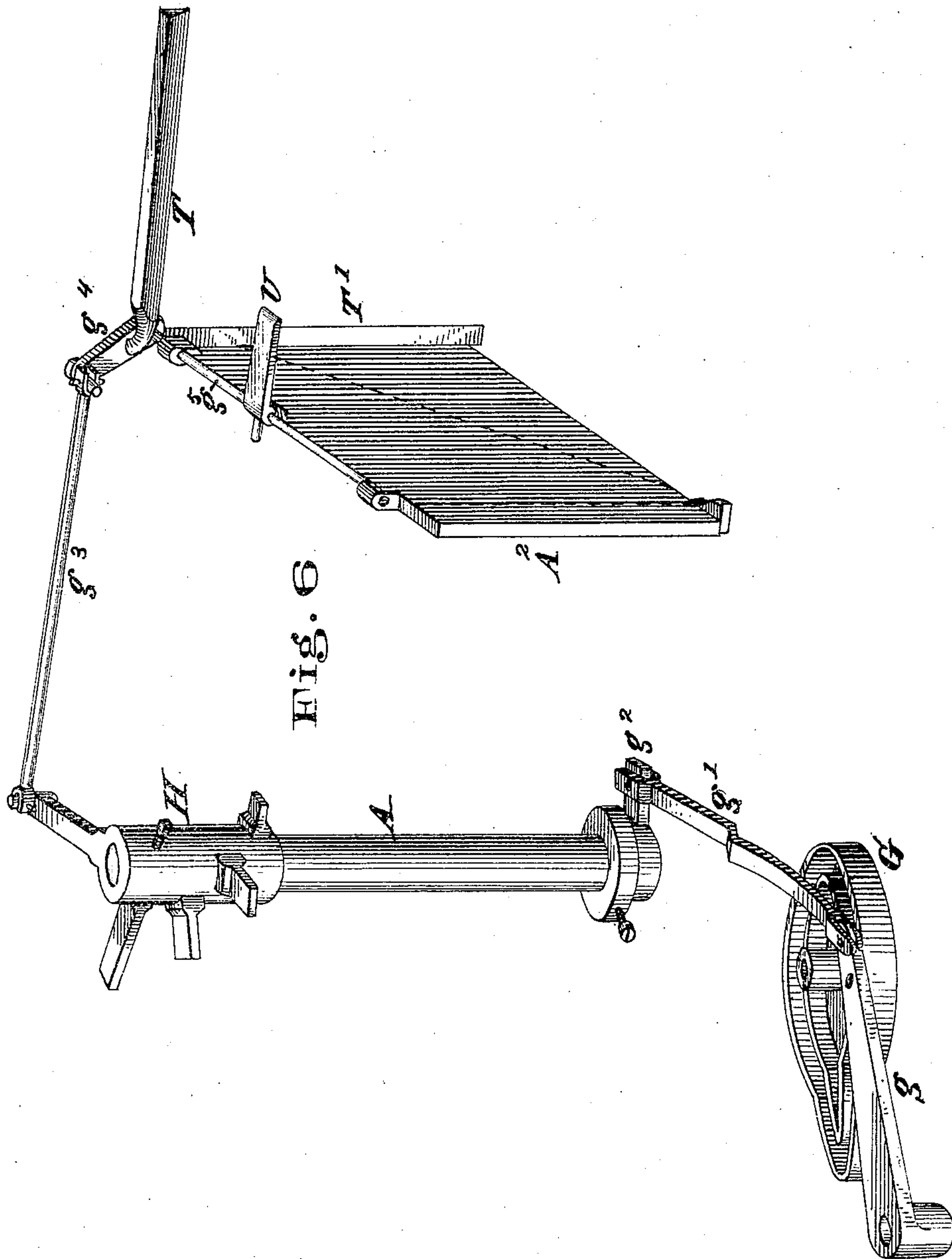
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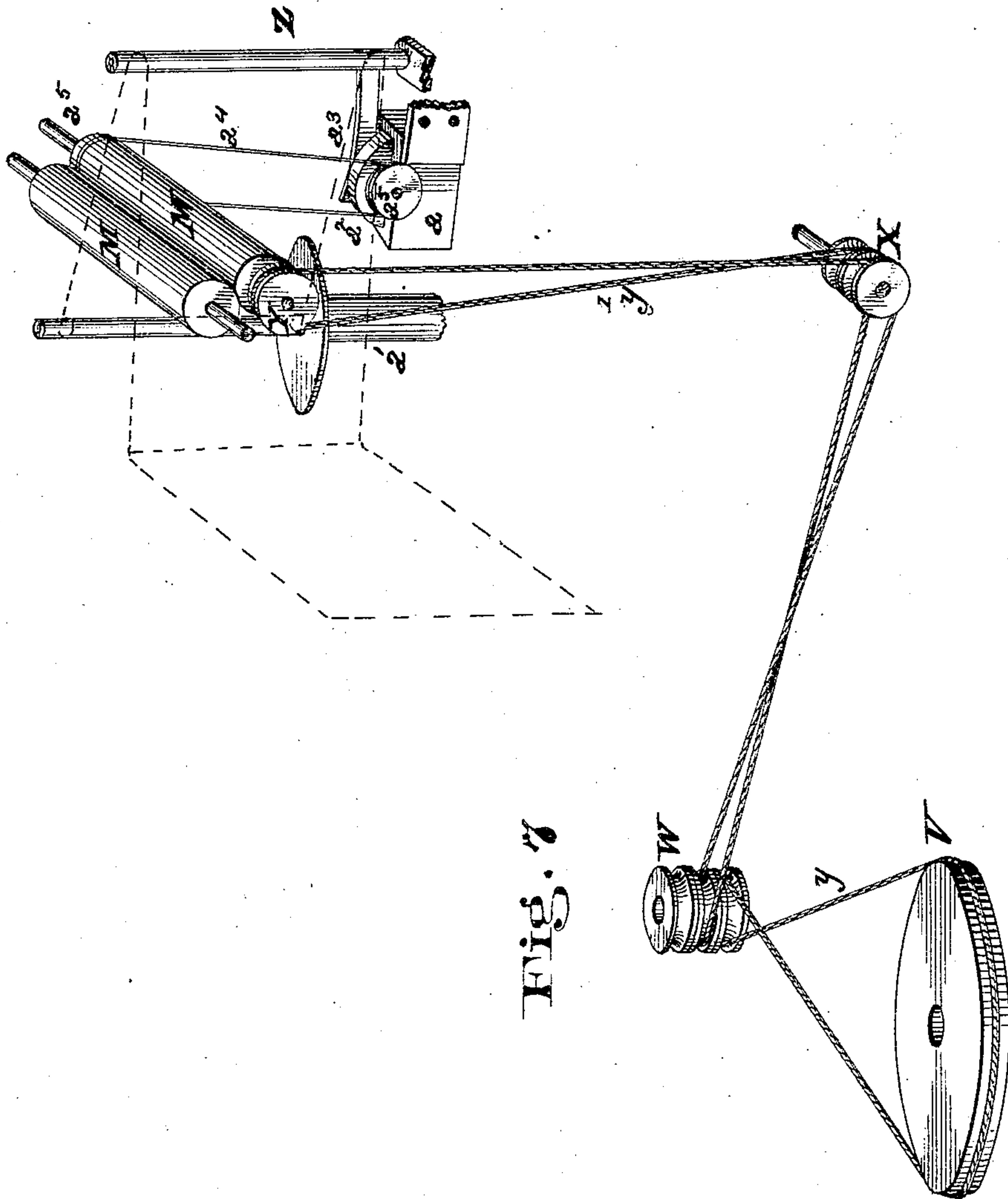


Fig. 7

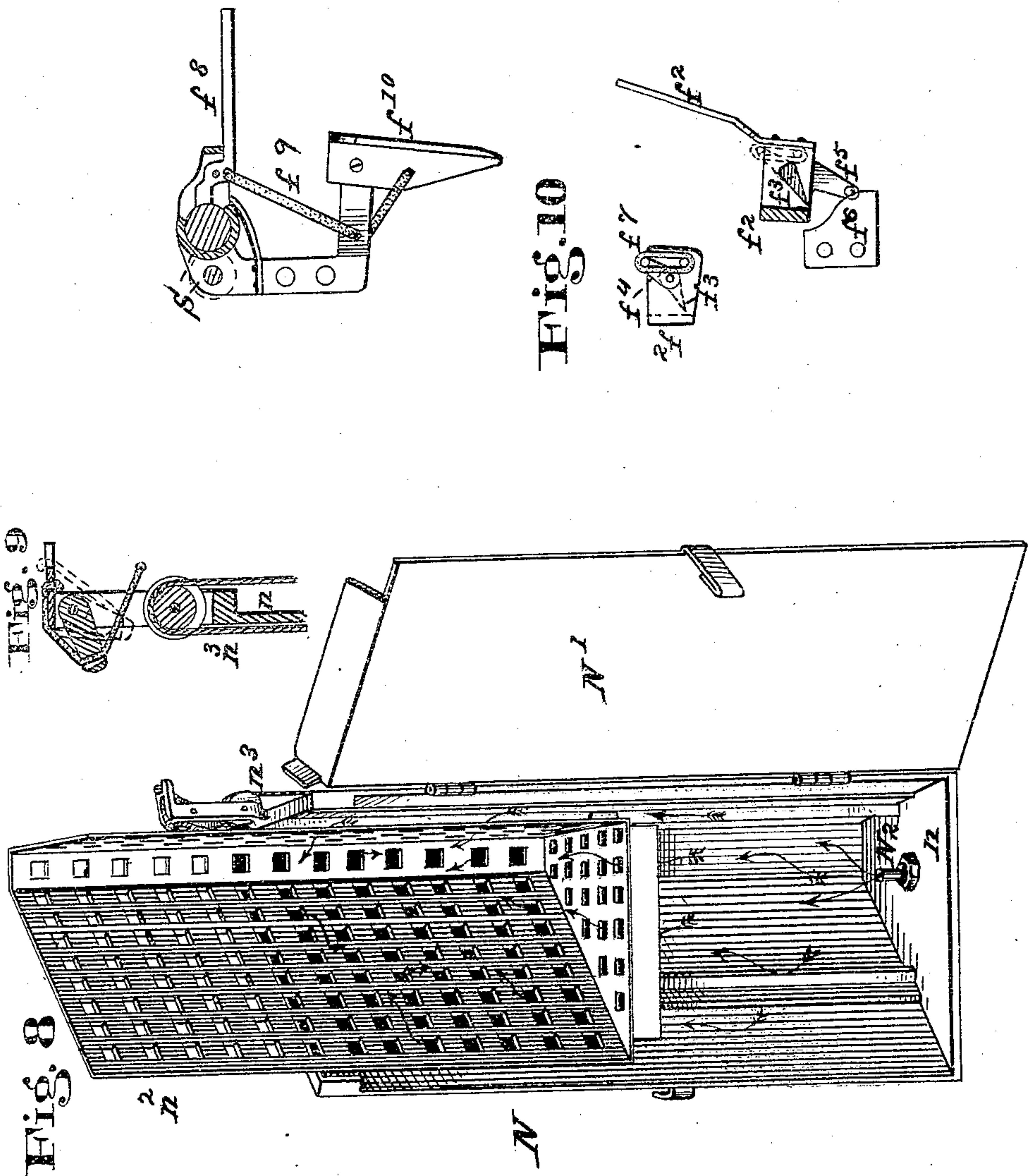
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Fig. 12

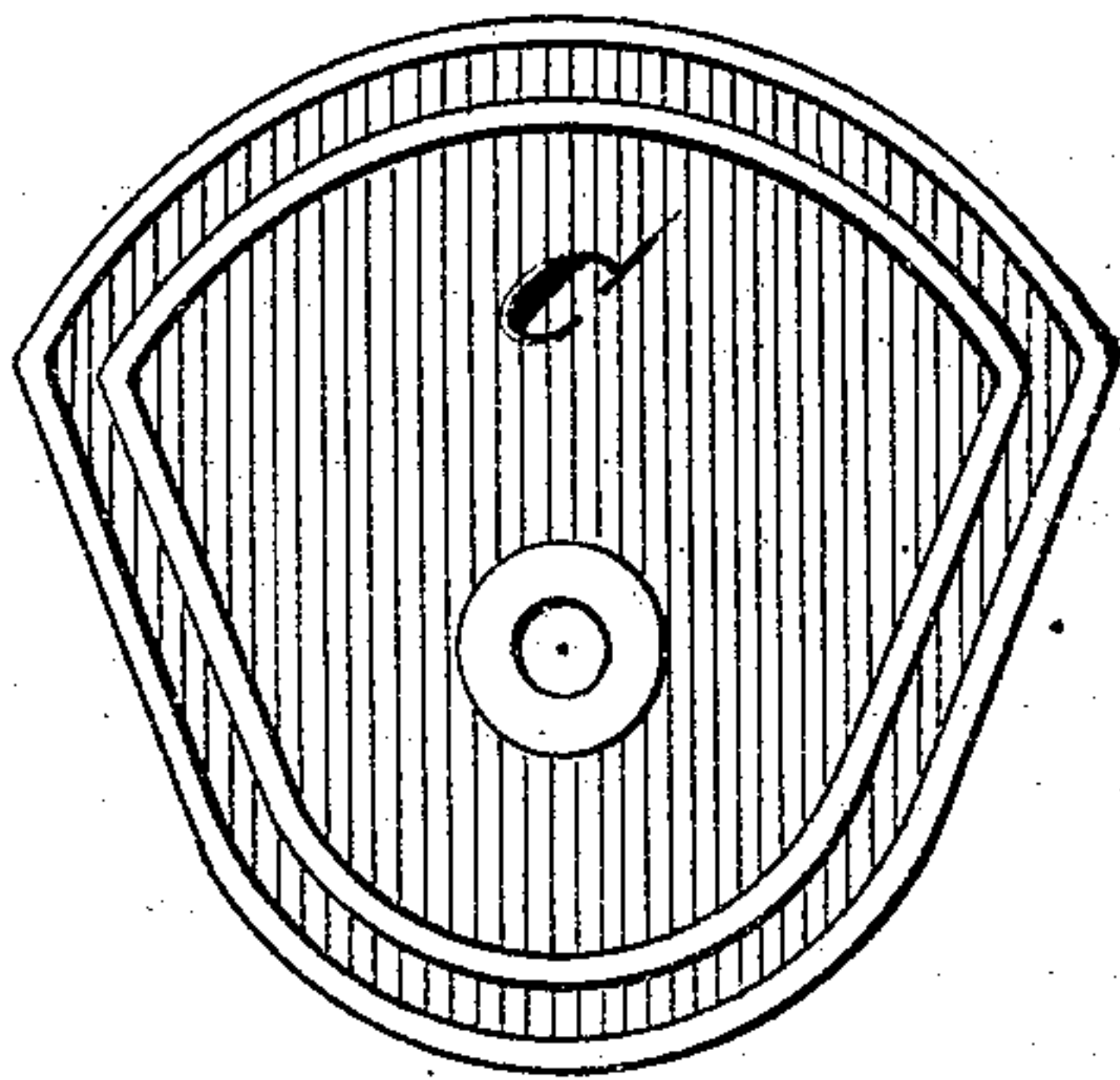


Fig. 13

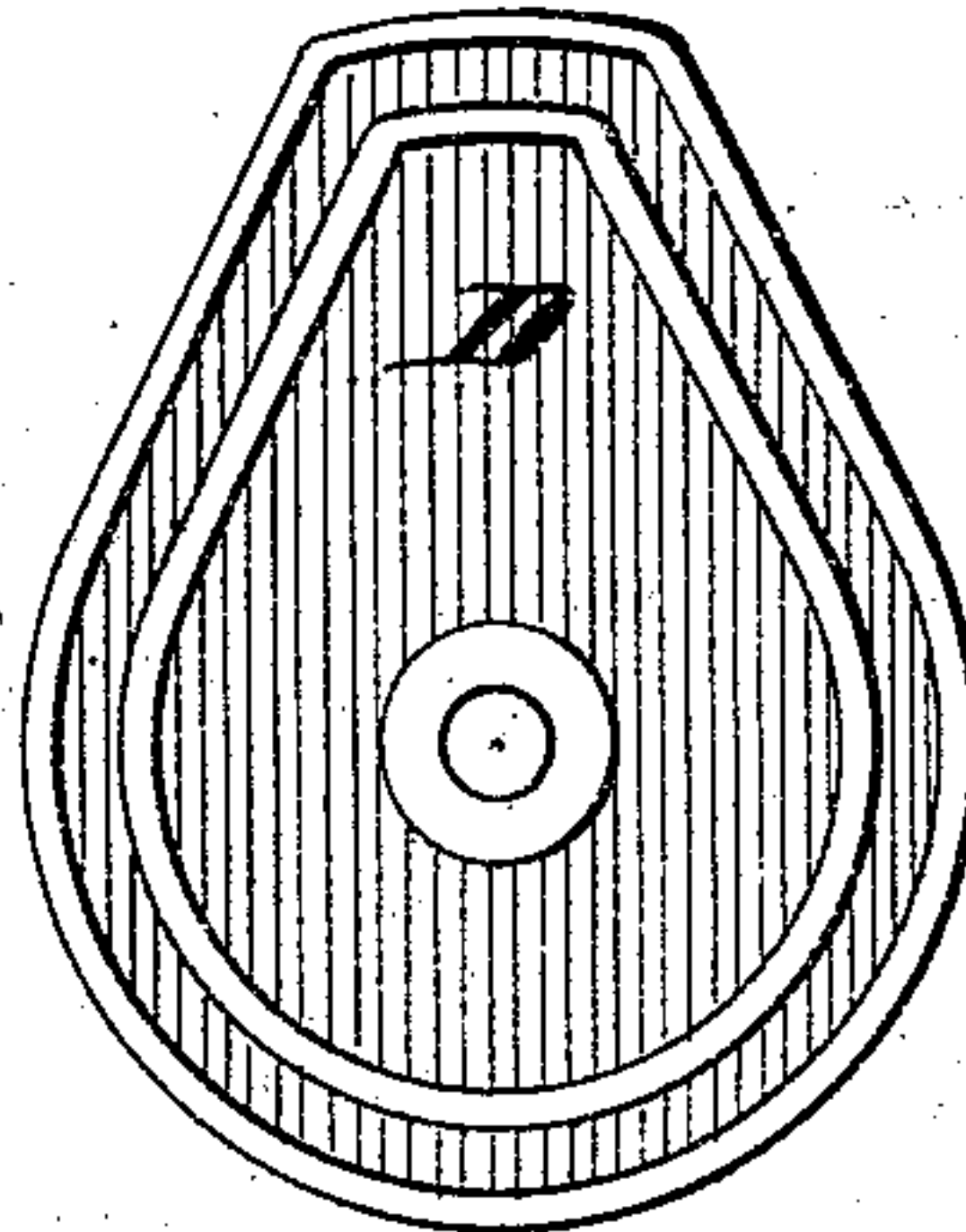


Fig. 14

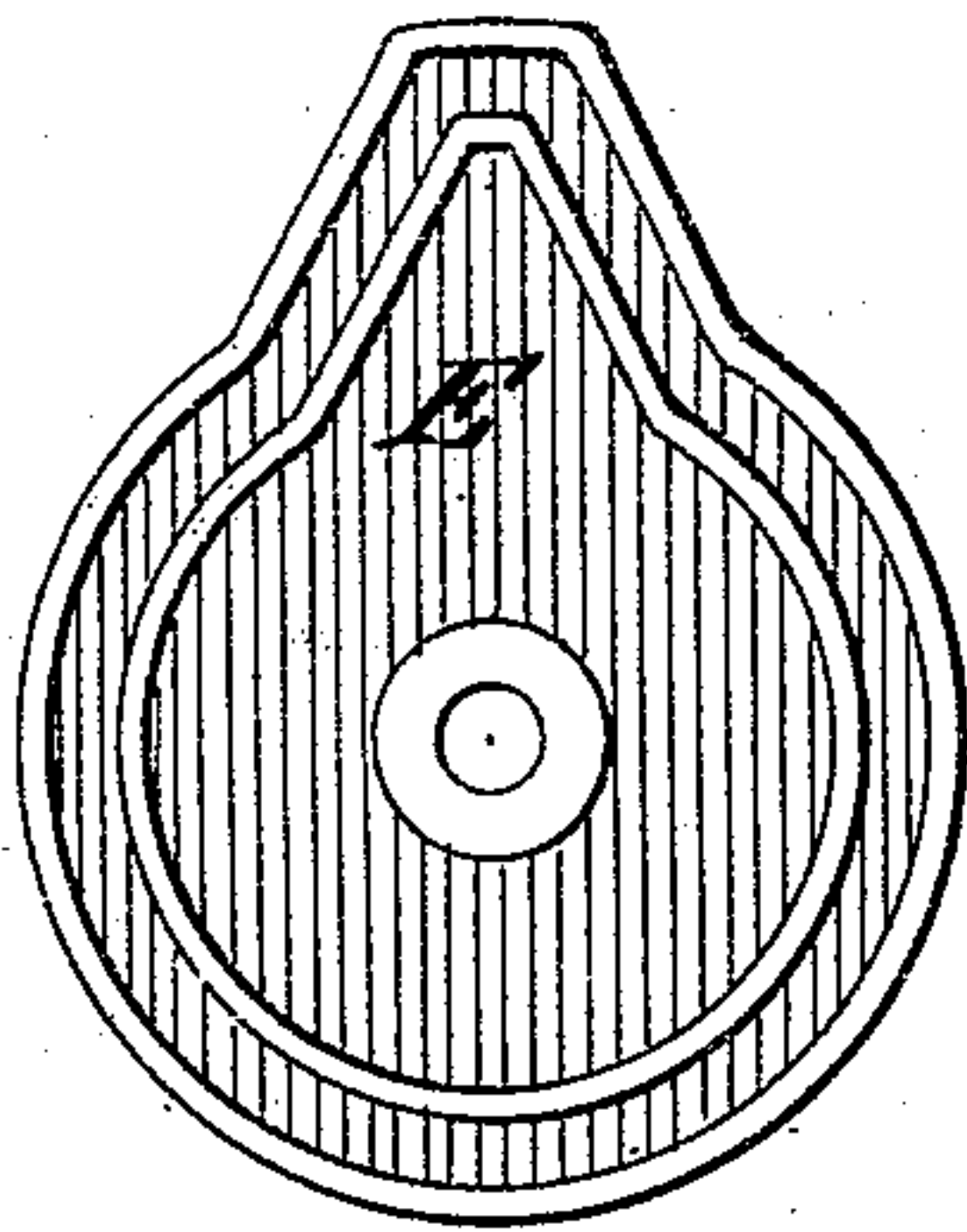


Fig. 15

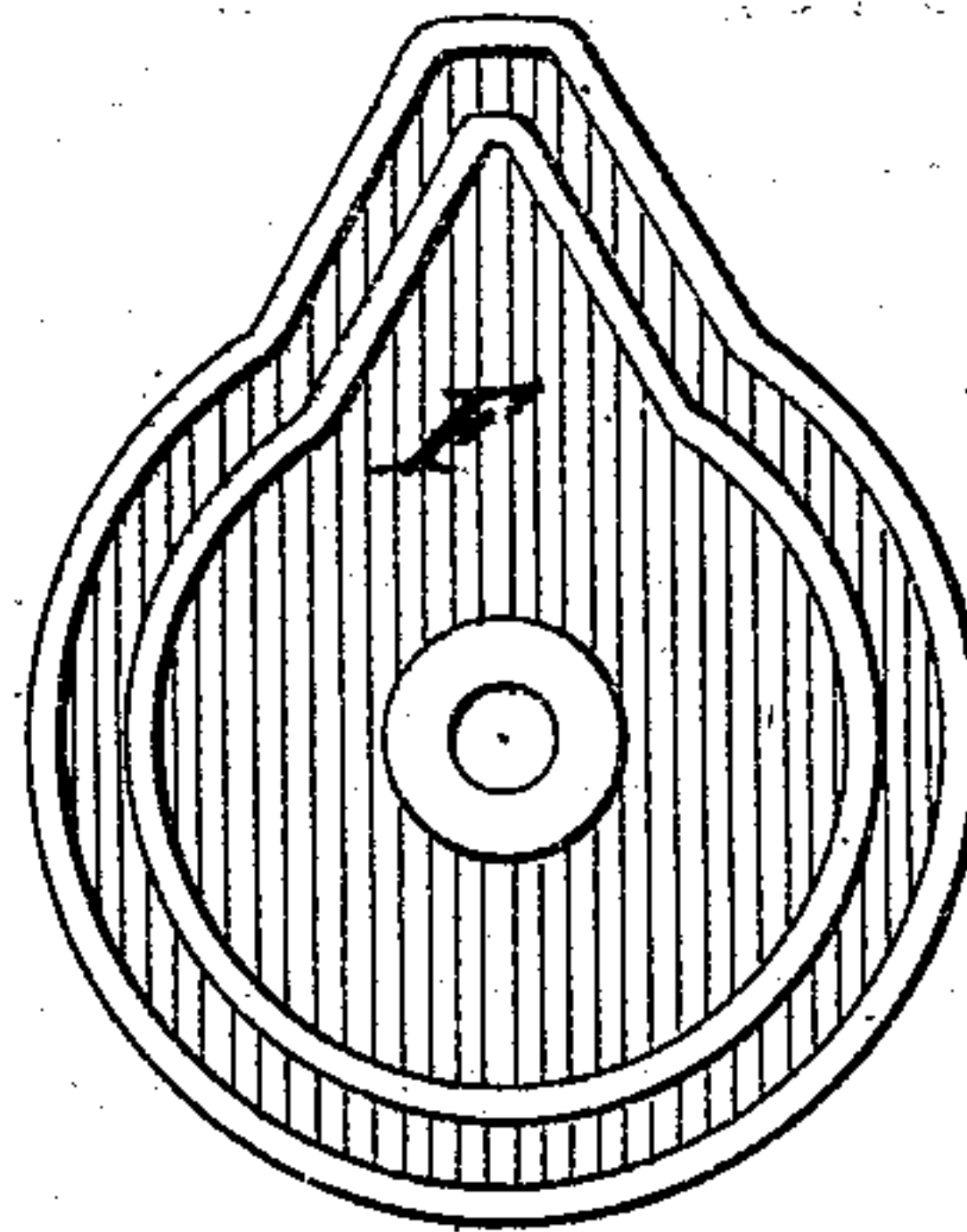
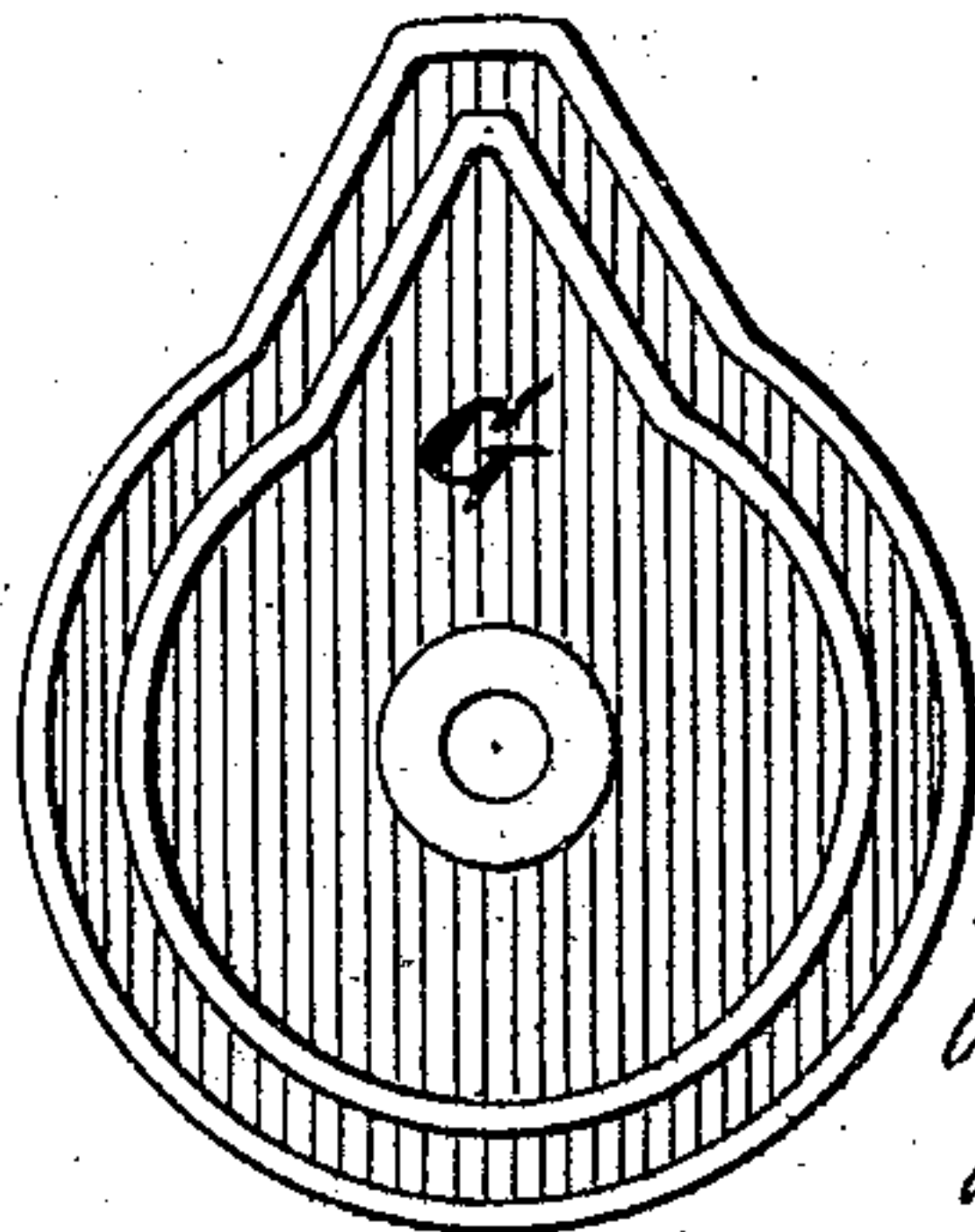


Fig. 16



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UNITED STATES PATENT OFFICE.

DANIEL APPEL AND JACOB MATHES, OF CINCINNATI, OHIO.

IMPROVEMENT IN PAPER-BAG MACHINES.

Specification forming part of Letters Patent No. 153,295, dated July 21, 1874; application filed November 20, 1873.

To all whom it may concern:

Be it known that we, DANIEL APPEL and JACOB MATHES, both of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Machines for Manufacturing Paper Bags, of which the following is a specification:

Our invention relates to the class of machines organized to manufacture triangular bags or cornucopias, and consists in the arrangement of a series of machines around a common central shaft, from which all can be conveniently and compactly operated for the purpose of enabling the manufacture of bags of different sizes at one and the same time, and in the provision, upon this central shaft, of a series of spiders by which all the machines are operated, and also in the provision of a single counter-shaft, armed with cams, by which all the vibrating spiders upon the central shaft are operated. Our invention further consists of peculiar combination of mechanisms or instrumentalities by which the paper is operated upon in the successive stages in the manufacture of the bag.

Figure 1 is a perspective view of an entire machine connected to a central shaft, whose spiders have arms or members sufficient to operate five machines arranged radially, and connected each to a single member of each spider. Figs. 2, 3, 4, 5, and 6 represent in perspective the combinations of parts operated by the five cams and spiders necessary to operate either one, two, three, four, or five machines, or, in other words, as many machines as there are members to each spider. Fig. 7 exhibits in perspective the paper roll from which the bags are made, the pasting device for applying paste to the lower edge for the seam of the bag, and the discharging-rolls to carry off the finished bag. Figs. 8 and 9 represent details in perspective and section, respectively, of the receiver for the finished bags. Fig. 10 represents detached views in section and plan of the nippers and feed-rolls by which the paper is carried across the forming-table. Fig. 11 (Sheet 3) is a cross-section of the seam-pasting device. Figs. 12, 13, 14, 15, and 16 are face plans of the grooved cams for operating the five spiders. Fig. 17 is a

perspective sketch of the bag before the side seam is lapped and pasted.

The paper from which the bags are made is taken from the roll or reel a^1 , guided to the pasting device by idler or reel Z, and pasted, as shown in Fig. 17, at k , on the lower edge, by the paste-wheel a^2 , the paper being held in place against the side of the wheel by spring a^3 . From this point the paper passes through the rollers S S, which are operated at intervals to feed the paper sufficiently only for the nippers f^3 to grasp, by which it is carried across the forming-table A^2 . The portion thus carried over is held by the vibratory holder U, and the former-plate c^4 over which (after being cut off by the shears T T') it is folded by the vibrating folding-plate Q. The lap k^2 is then, by the folding-lapper P, laid over the pasted portion k of the folded side k' of the bag. (See Figs. 1 and 17.) The finished bag is then carried up by the former-plate c^4 into the position this plate occupies in Fig. 1, when it is pushed off by the discharging-fingers c^6 into the discharging-rolls M M, by which it is carried into the receiver N and pressed down into the balanced sinking box n^2 by the packing-plate c^9 . When the case n^2 is full the receiver N is swung around and the bags removed therefrom, the time they remain in the receiver being long enough to permit hot air or dry steam through pipe N^2 to dry them. The connecting devices for operating these instrumentalities may be described as follows: The driving-shaft B is fitted with a series of cams, C D E F G, which serve to operate, through arms and pitmen $c^2 c^1$, $d d^1$, $e e^1$, $f f^1$, and $g g^2 g^1$, respectively, the series of spiders H I J K L on shaft A, the spider H being attached to the shaft and operated by arm g^2 , and the other spiders being so attached as to loosely vibrate on shaft A, which is journaled in the stationary casting A^3 , which is a part of the frame A^1 of the machine, and which carries the forming-tables A^2 .

The number of arms or members upon each of the spiders is determined by the number of machines required around the shaft A, as each member drives a separate and distinct machine for making bags.

The former-plate c^4 , of which the crank or

arm c^4 is a part, is operated by the cam C, arm c , pitman c^1 , crank c^2 , spider I, and pitman c^3 , and the arm c^5 upon the shaft of this swinging former operates the bag-discharging fingers c^6 , through the rod c^{11} and bell-cranks c^{10} hinged to the frame A^1 at c^{12} . The arm c^7 , also attached to the shaft of the former c^4 , drives the packing-plate c^9 . (See Fig. 2.)

The lap-folding plate P is operated by cam D, arm d , pitman d^1 , spider J, pitman d^2 , and double crank-rod $d^3 d^4 d^5$. (See Fig. 3.)

The folding-plate Q is operated by cam E, arm e , pitman e^1 , spider K, pitman or swiveling link e^2 , and angular cranks e^3 , the pin of one crank sliding in the slot of the other. (See Fig. 4.)

The feeding-nippers, composed of feeding-arm f^2 and vibrating nipper f^3 , are driven by cam F, arm f , pitman f^2 , and spider L, the nipper f^3 being opened when about to receive the paper from the rolls S S by the crank f^5 , which strikes against the hinged spring-projection f^{10} so as to open the nippers, the arm f^2 at the same time striking the ratchet-arm f^8 , which causes the rolls S to push the paper into the mouth of the nippers, which are closed on the return stroke by the crank f^4 and spring f^7 . The ratchet-arm is returned by the spring-cord f^9 , and the crank f^5 returns at the back stroke inside of the hinged plate f^{10} , and when this return stroke has carried the paper over the face of table A^2 the crank f^5 strikes a projection, f^6 , (seen only in Figs. 5 and 10,) on the frame A^1 of the machine.

The cutting-off shears T T¹ are operated by cam G, arm g , pitman g^1 , arm g^2 , shaft A, spider H, pitman g^3 , and arm g^4 , and the shaft g^5 of these shears, which passes through the hollow shaft of plate c^4 , operates the blank-holder U. The shear T' is stationary, and T alone vibrates.

The bag-discharging rolls M M are operated by pulley V, cords $y y^1$, idlers W and X, and pulley Y, and the paste-roller is driven by pulleys a^5 and cord or belt a^4 , the paste-wheel revolving in a vat, a , of paste.

The receiver N has a door, N, from which the finished bags are removed, and this receiver is made to swing, after the stoppage of the machine, on a center, so as to face the door outside, for convenience of removing the bags. The bags are supported, as they come from the machine, on the bottom of the descending case n^2 , which slides within the outer case n , and is balanced by cords n^3 and weights O, the packing-plate c^9 acting to force down the case n^2 by successive steps the thickness of each bag.

We claim—

1. A series of paper-bag machines, the parts of which are operated by swinging spiders H I J K L fitted to a central shaft, A, common to all, and actuated by cams C D E F G, sub-

stantially in the manner and for the purpose specified.

2. A series of paper-bag machines, the parts of which are operated by swinging spiders H I J K L, actuated by cams C D E F G upon the same shaft B, substantially in the manner and for the purpose specified.

3. The combination of cam C, arm c , pitman c^1 , crank c^2 , spider I, pitman c^3 , and swinging former c^4 , connected and operating substantially in the manner and for the purpose specified.

4. The combination of cam C, arm c , pitman c^1 , crank c^2 , spider I, pitman c^3 , swinging former c^4 , and arm c^5 , and arms c^{10} and c^{11} , connected and operating the discharging-fingers c^6 , substantially in the manner and for the purpose specified.

5. The combination of cam C, arm c , pitman c^1 , crank c^2 , spider I, pitman c^3 , swinging former c^4 , crank c^7 , pitman c^8 , swinging packing plate or board c^9 , arm c^5 , fingers c^6 , arms c^{10} and c^{11} , discharge-rolls M, and receiver N, connected and operating substantially in the manner and for the purpose specified.

6. The combination of cam D, arm d , pitman d^1 , spider J, pitman d^2 , shaft $d^3 d^4 d^5$, and swinging lapper P, connected and operating substantially in the manner and for the purpose described.

7. The combination of cam E, arm e , pitman e^1 , spider K, pitman e^2 , slotted arm e^3 , and swinging folder Q, connected and operating substantially in the manner and for the purpose specified.

8. The combination of cam F, arm f , pitman f^1 , spider L, feeding-arm f^2 , swinging nipper f^3 , double arm $f^4 f^5$, projection f^6 , spring f^7 , ratchet-arm f^8 , feed-rolls S, spring f^9 , and swinging spring-guide f^{10} , connected and operating substantially in the manner and for the purpose specified.

9. The combination of cam G, arm g , pitman g^1 , arm g^2 , shaft A, spider H, pitman g^3 , crank g^4 , and knives or cutters T T', connected and operating substantially in the manner and for the purpose described.

10. The combination of cam G, arm g , pitman g^1 , arm g^2 , shaft A, spider H, pitman g^3 , crank g^4 , shaft g^5 , and swinging paper-holder U, connected and operating substantially in the manner and for the purpose specified.

11. The receiver N, composed of swinging outer case n , interior case n^2 , cords n^3 , and balance-weights O, connected and operating substantially in the manner and for the purpose specified.

In testimony of which invention we hereunto set our hands.

DANIEL APPEL.
JACOB MATHES.

Witnesses:
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F. MILLWARD.