

(No Model.)

8 Sheets—Sheet 1.

L. C. CROWELL.  
NEWSPAPER WRAPPING MACHINE.

No. 486,090.

Patented Nov. 15, 1892.

Fig. 2.

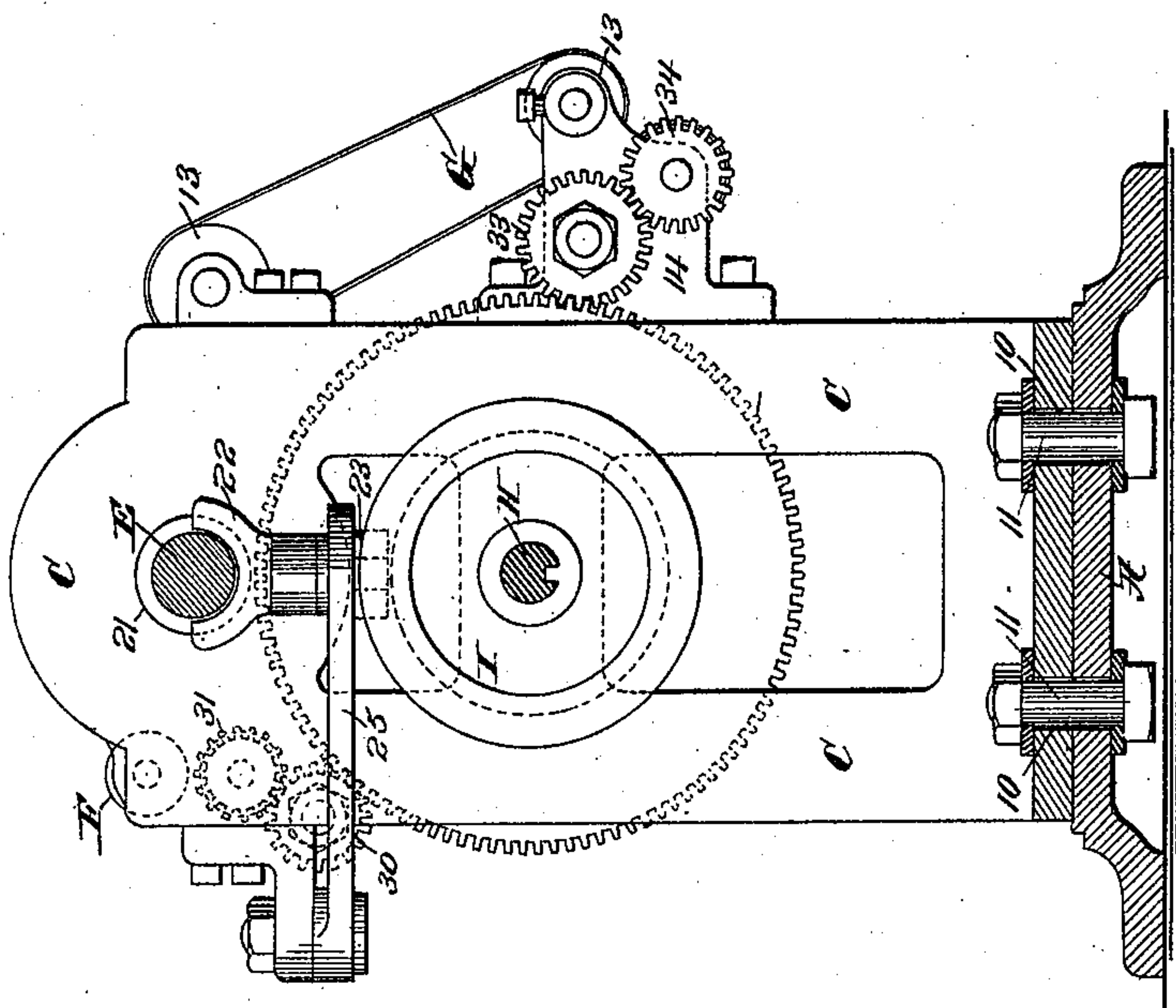
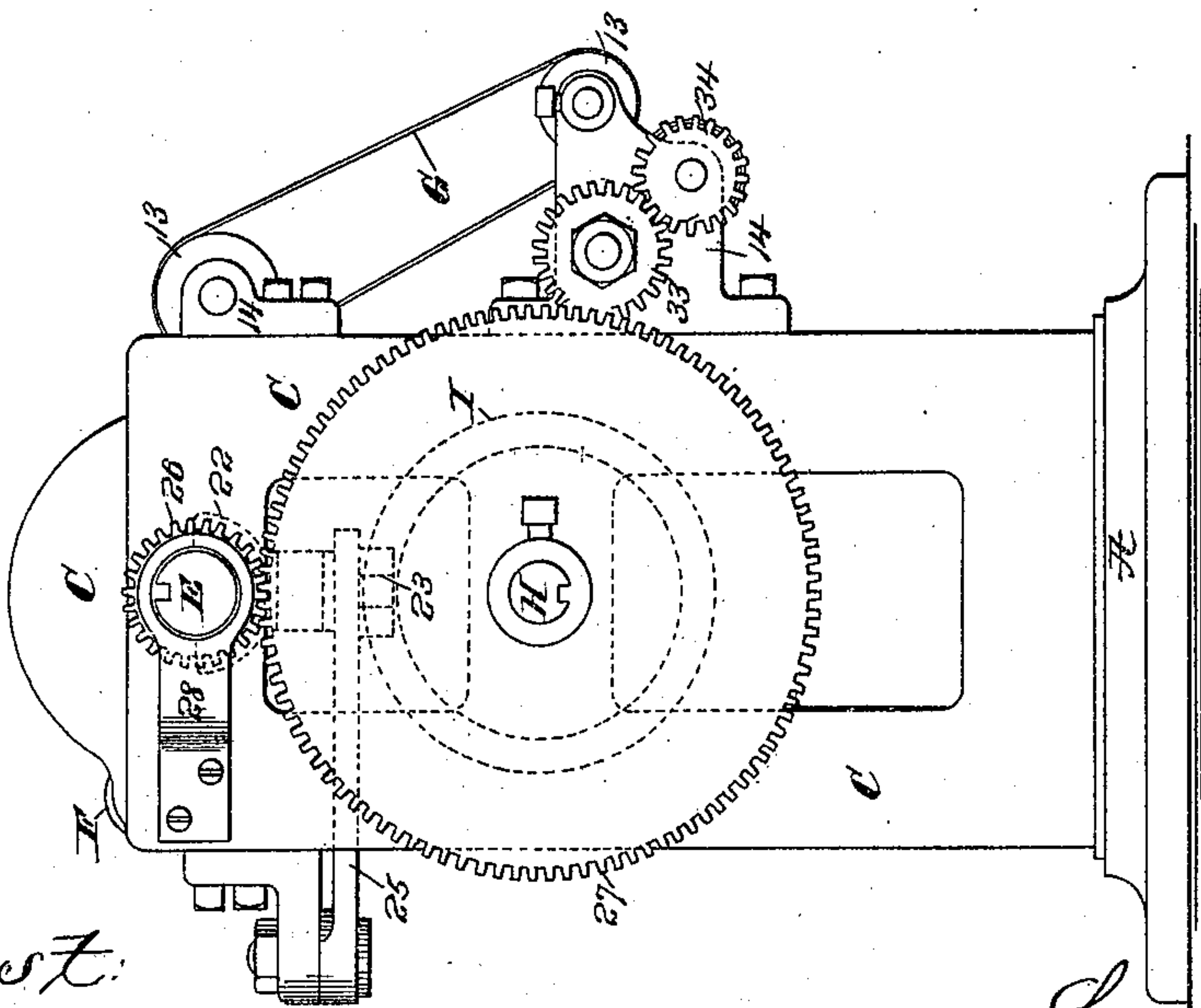


Fig. 1.



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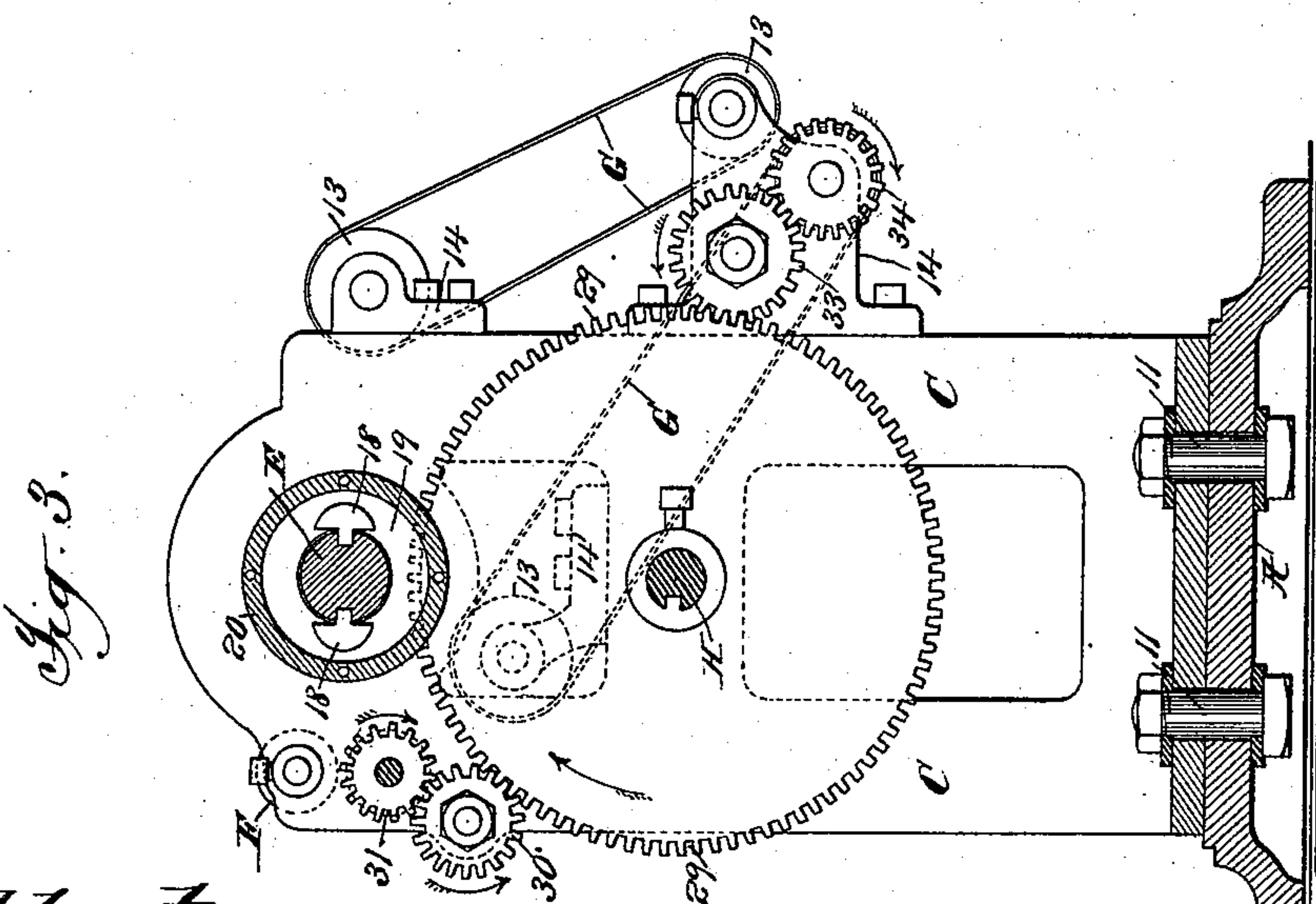
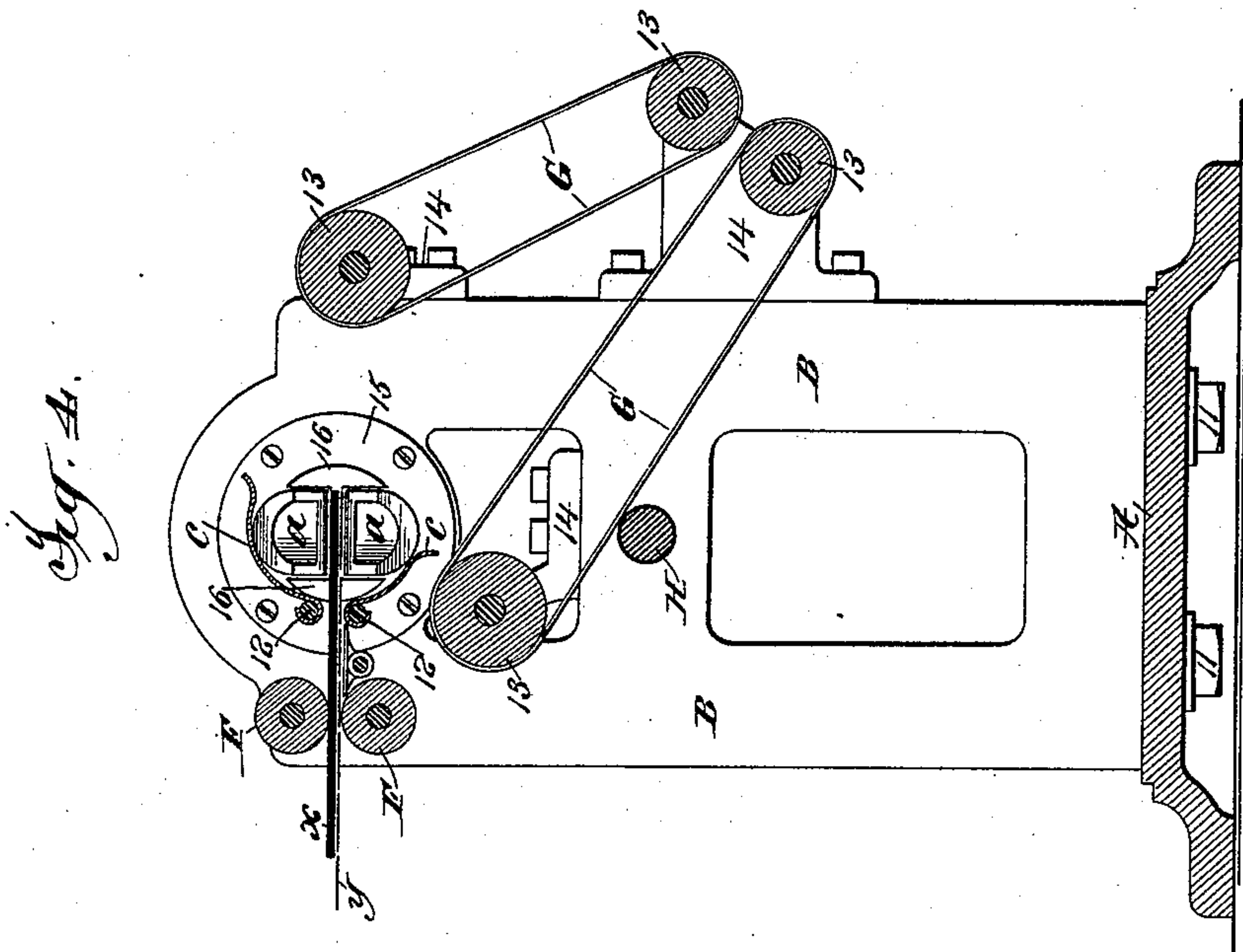
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8 Sheets—Sheet 2.

L. C. CROWELL.  
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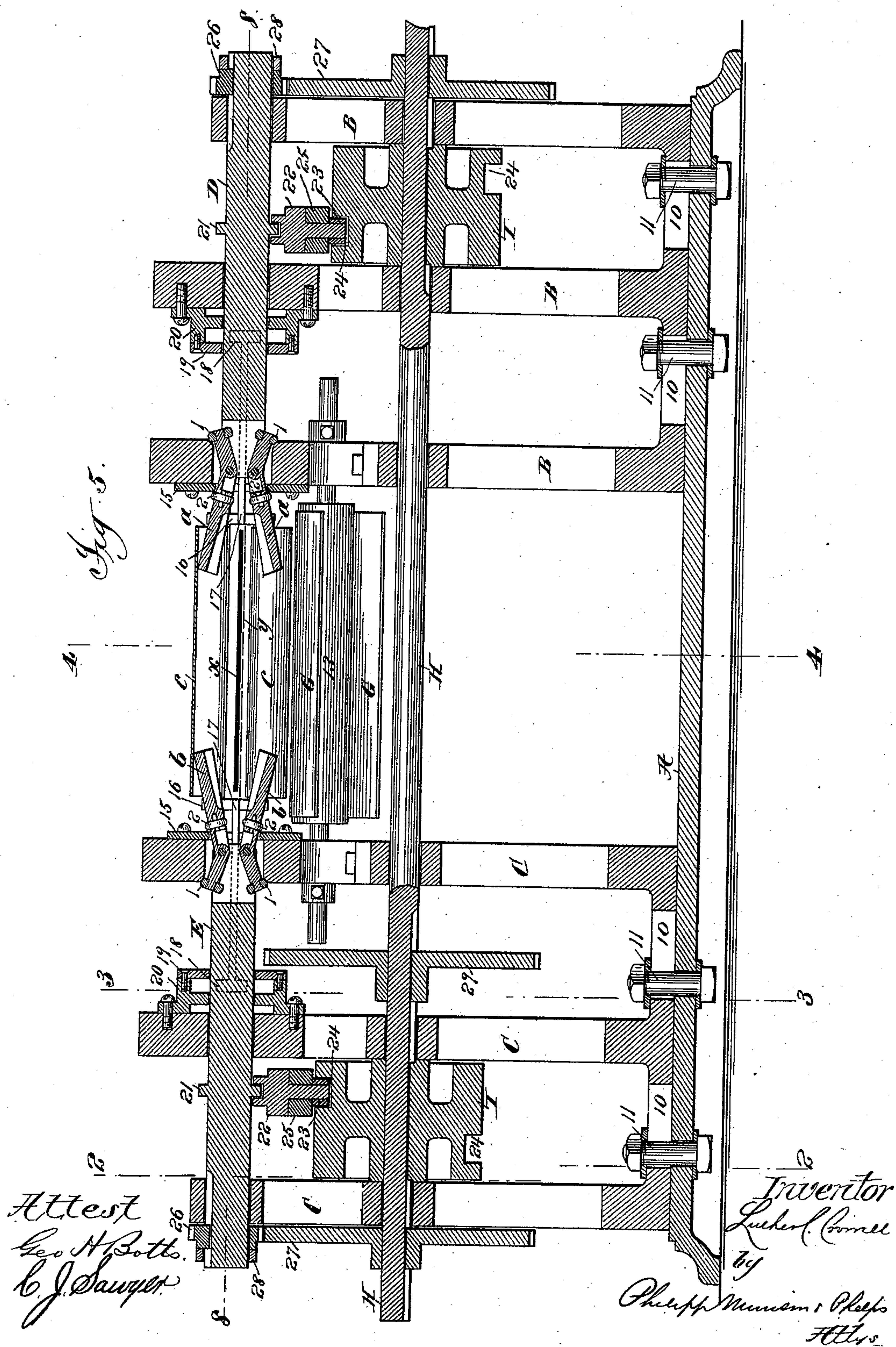
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L. C. CROWELL.  
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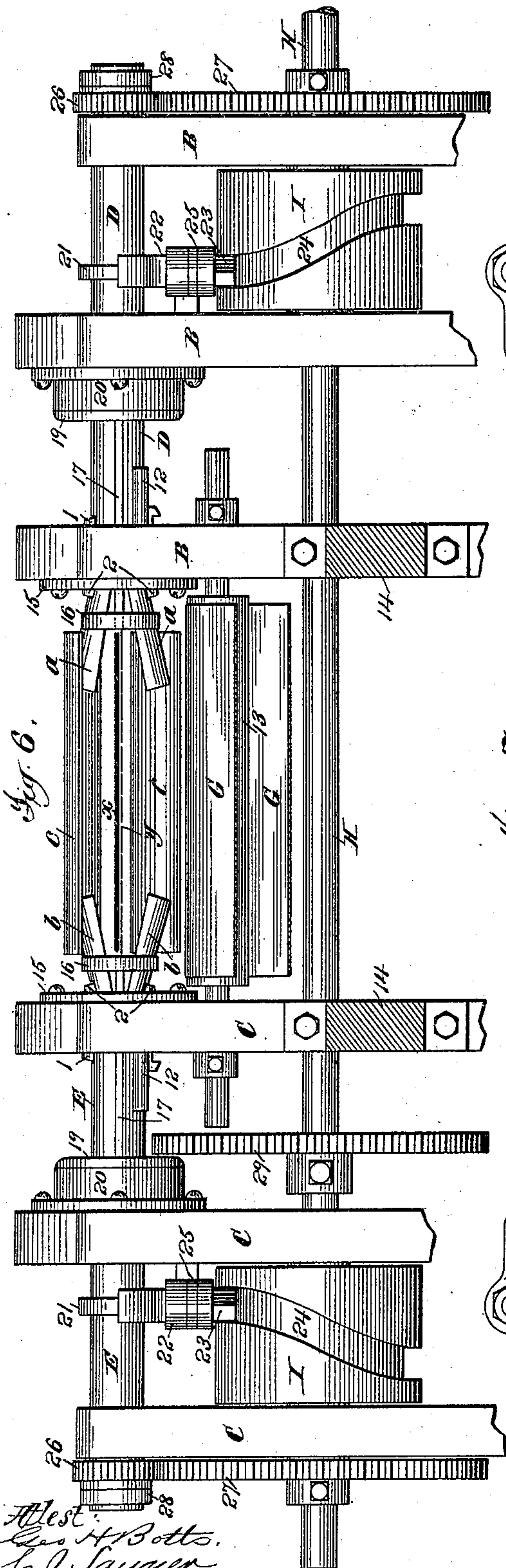
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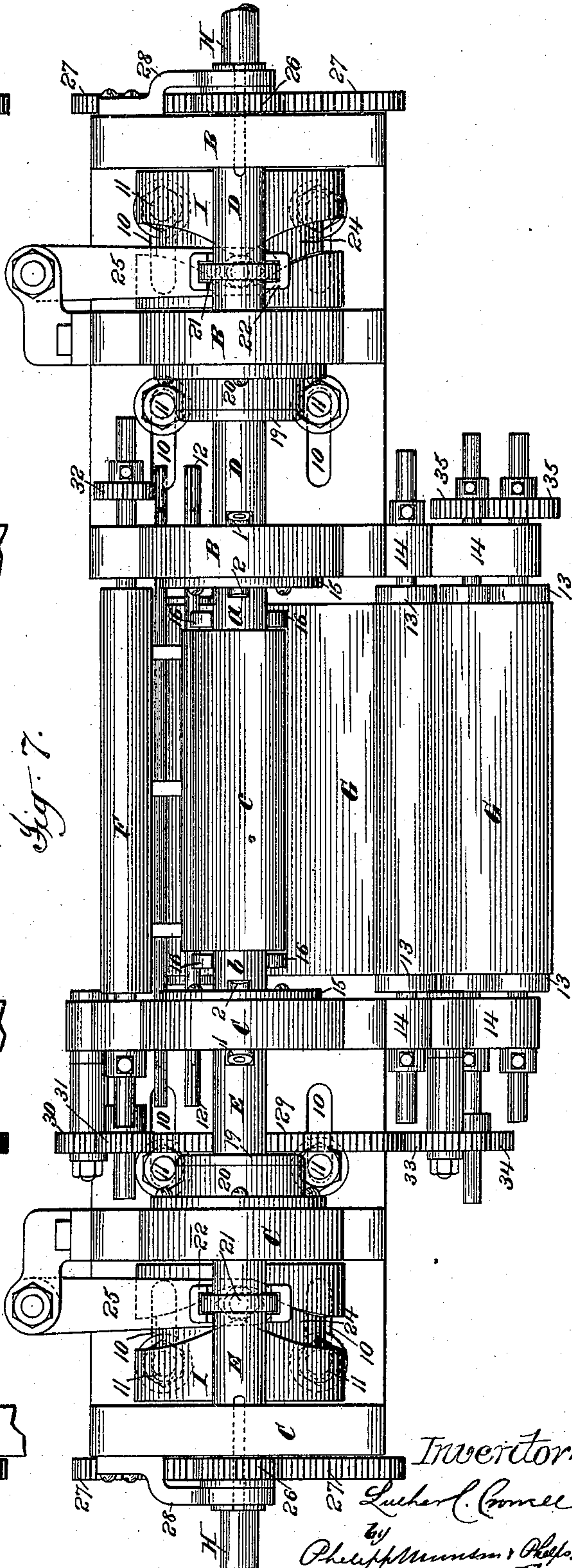
L. C. CROWELL.  
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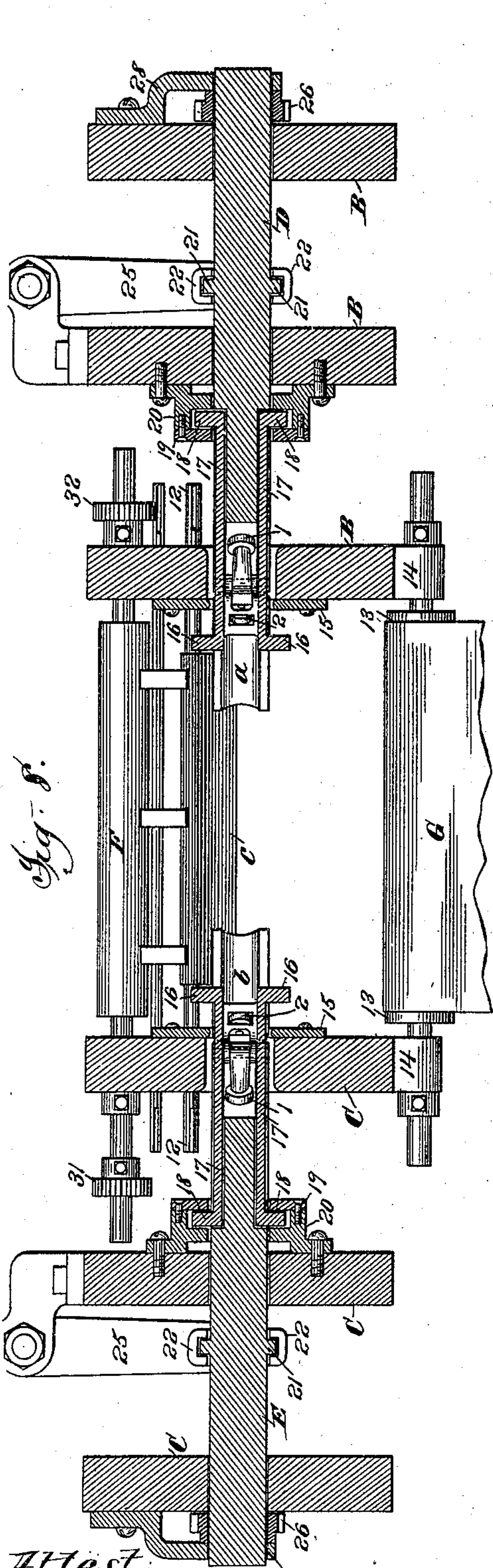
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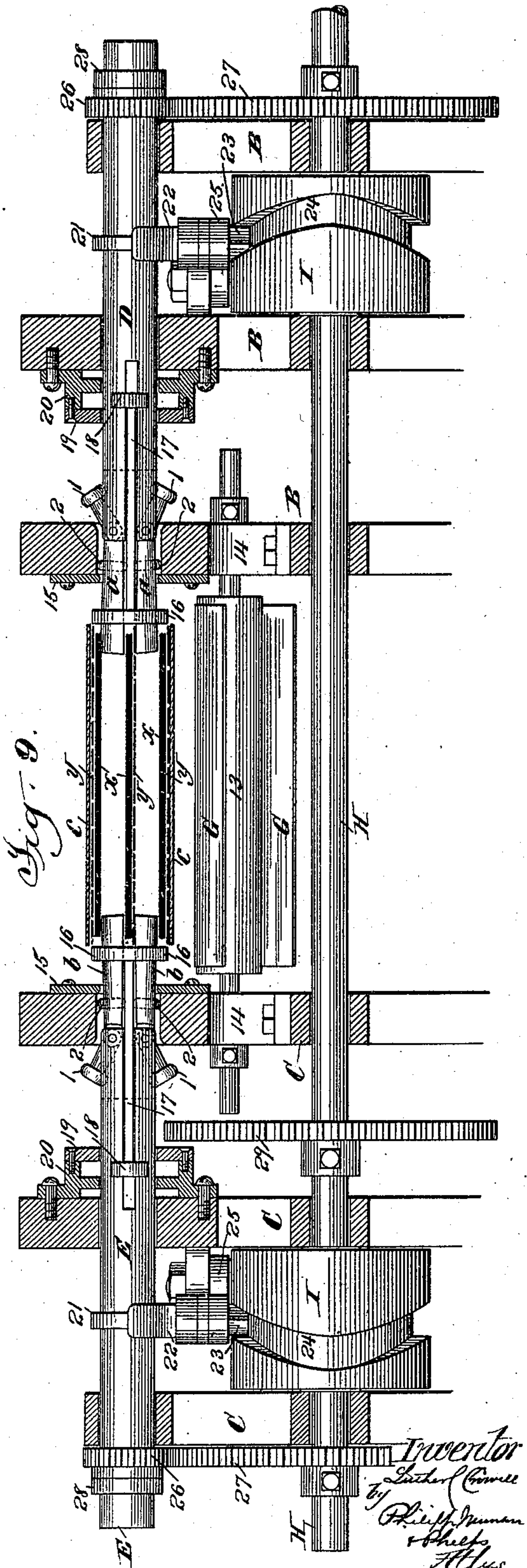
L. C. CROWELL.  
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(No Model.)

8 Sheets—Sheet 6.

L. C. CROWELL.  
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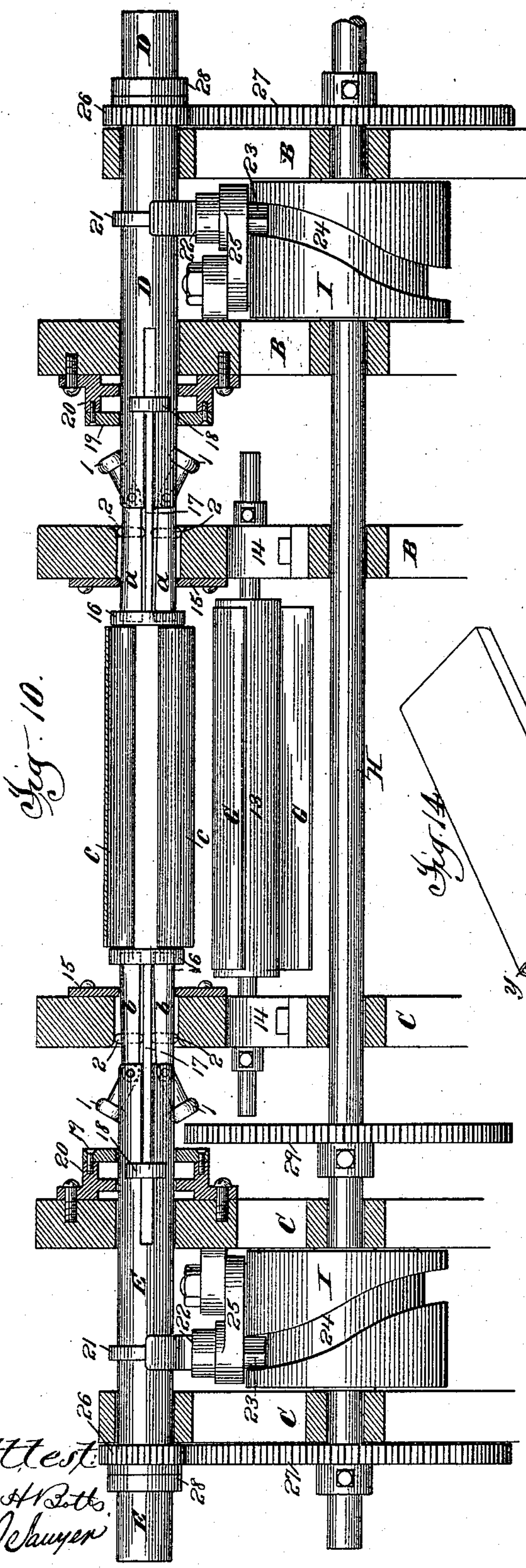


Fig. 10.



Fig. 14.

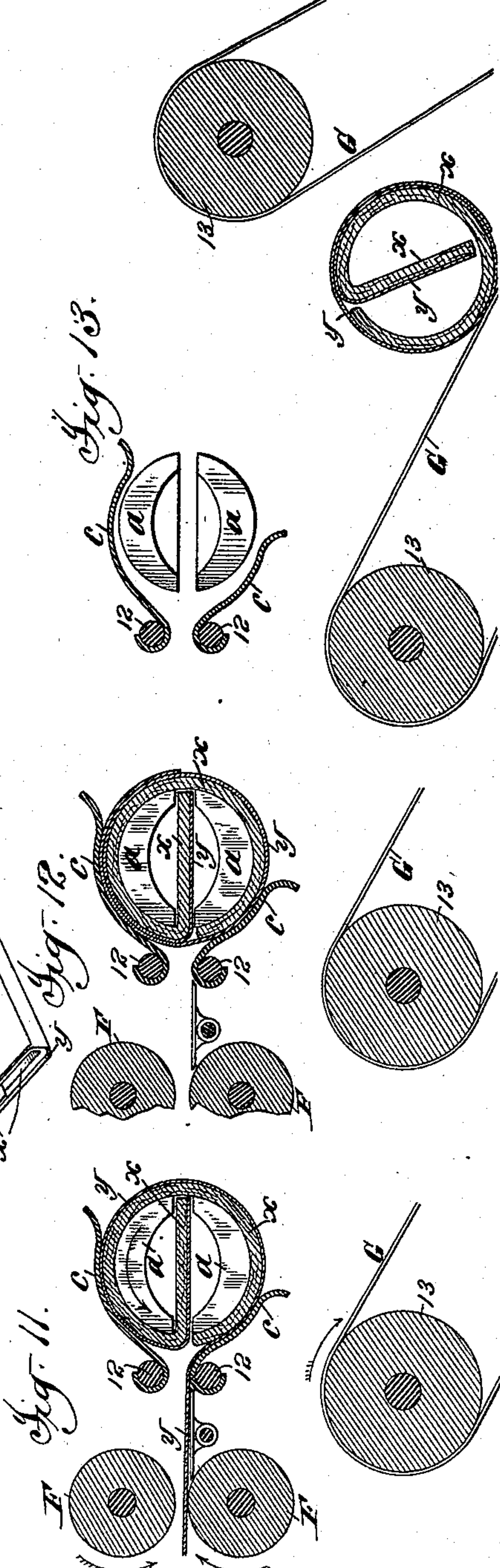


Fig. 11.

Fig. 12.

Fig. 13.

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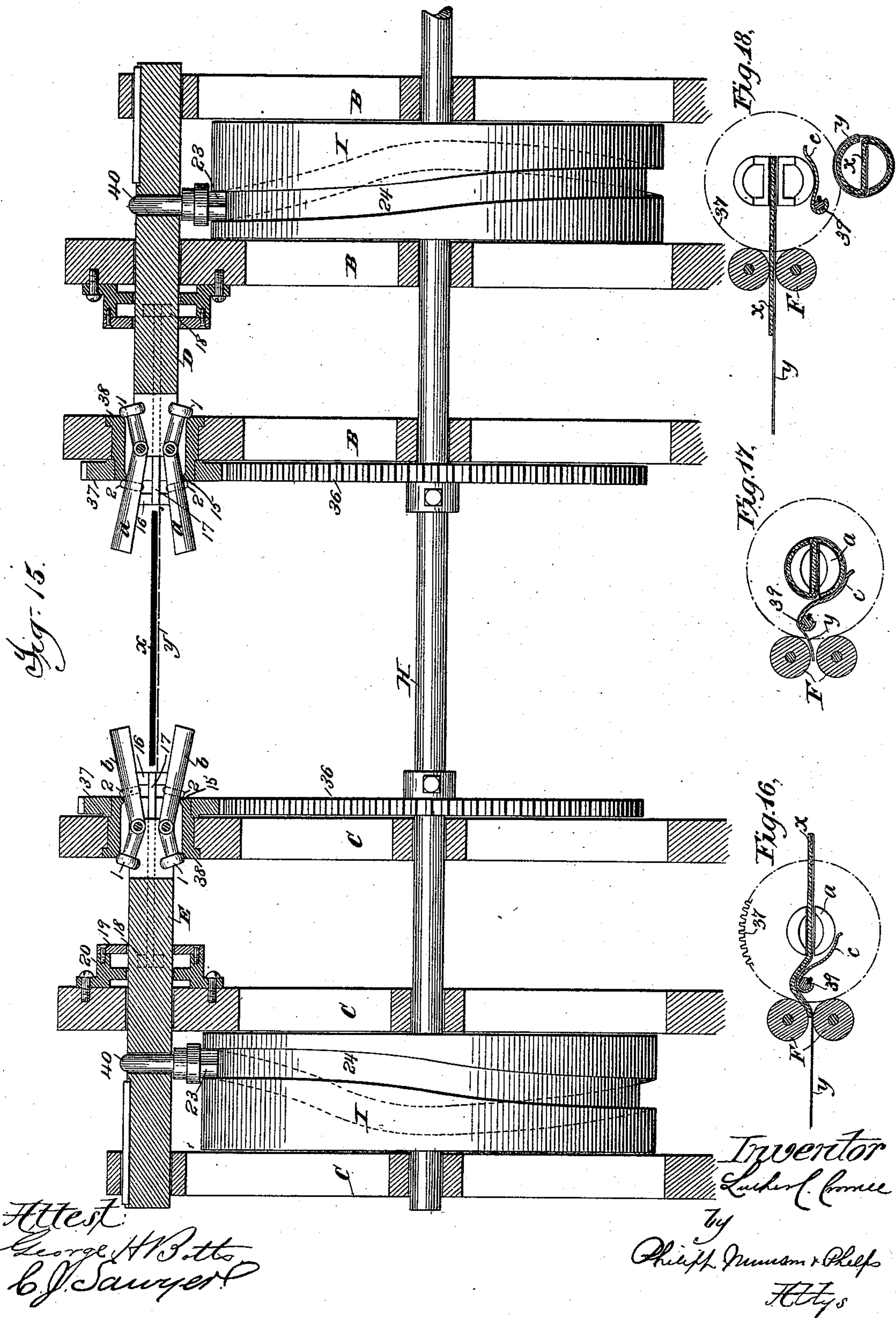
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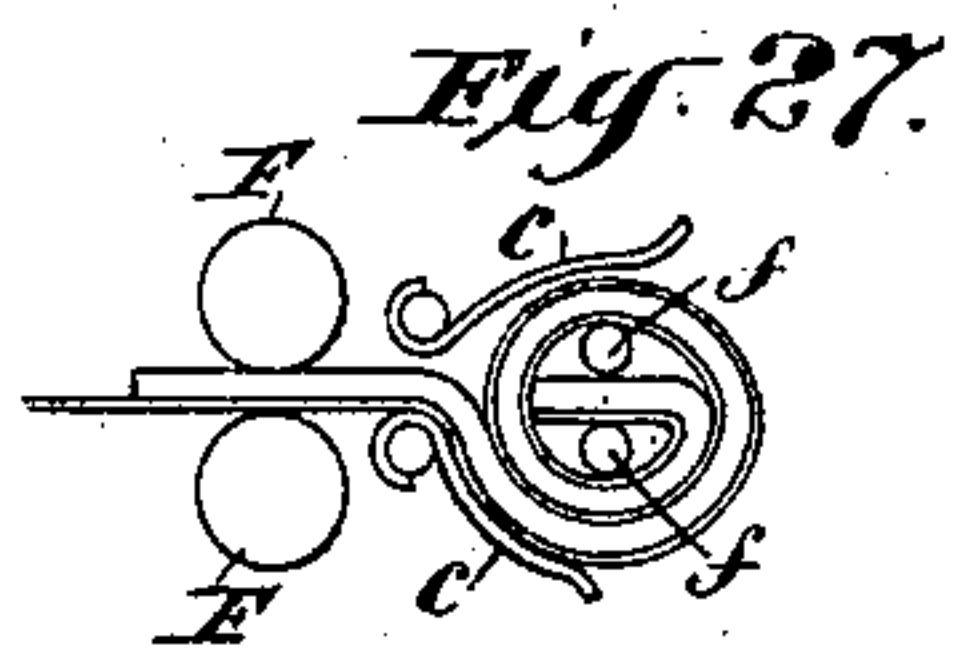
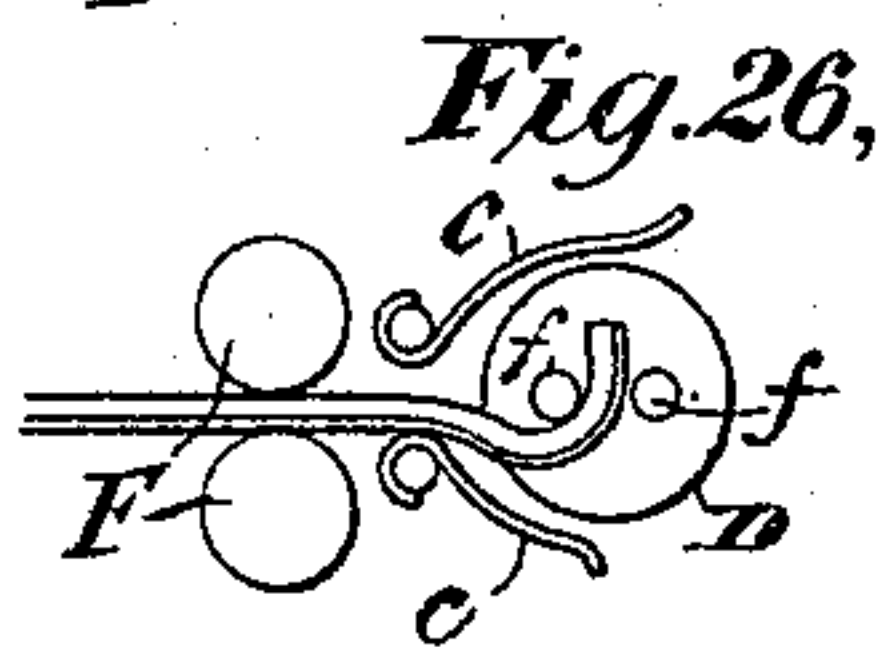
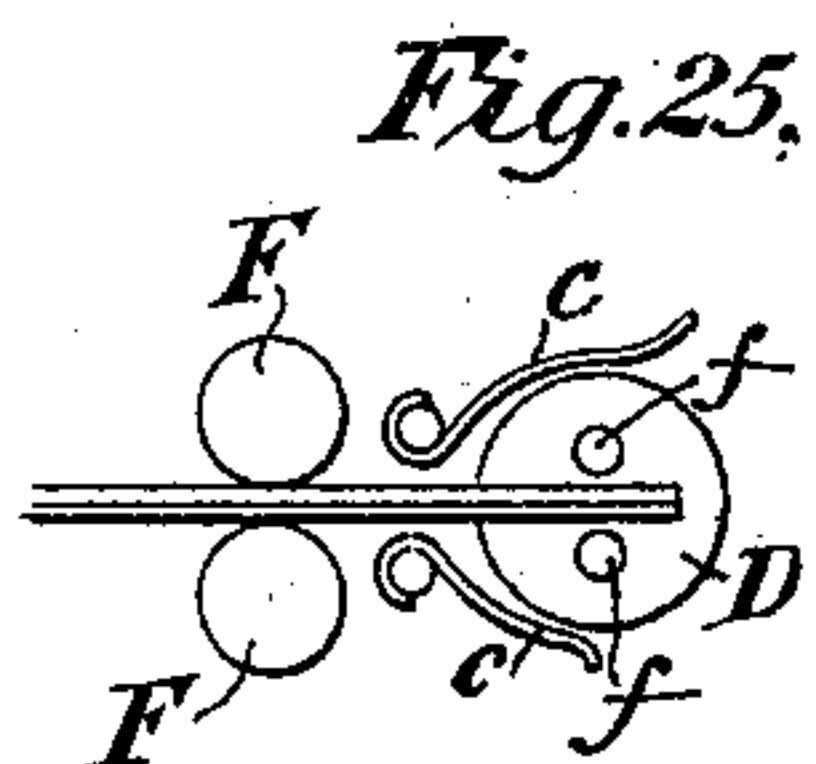
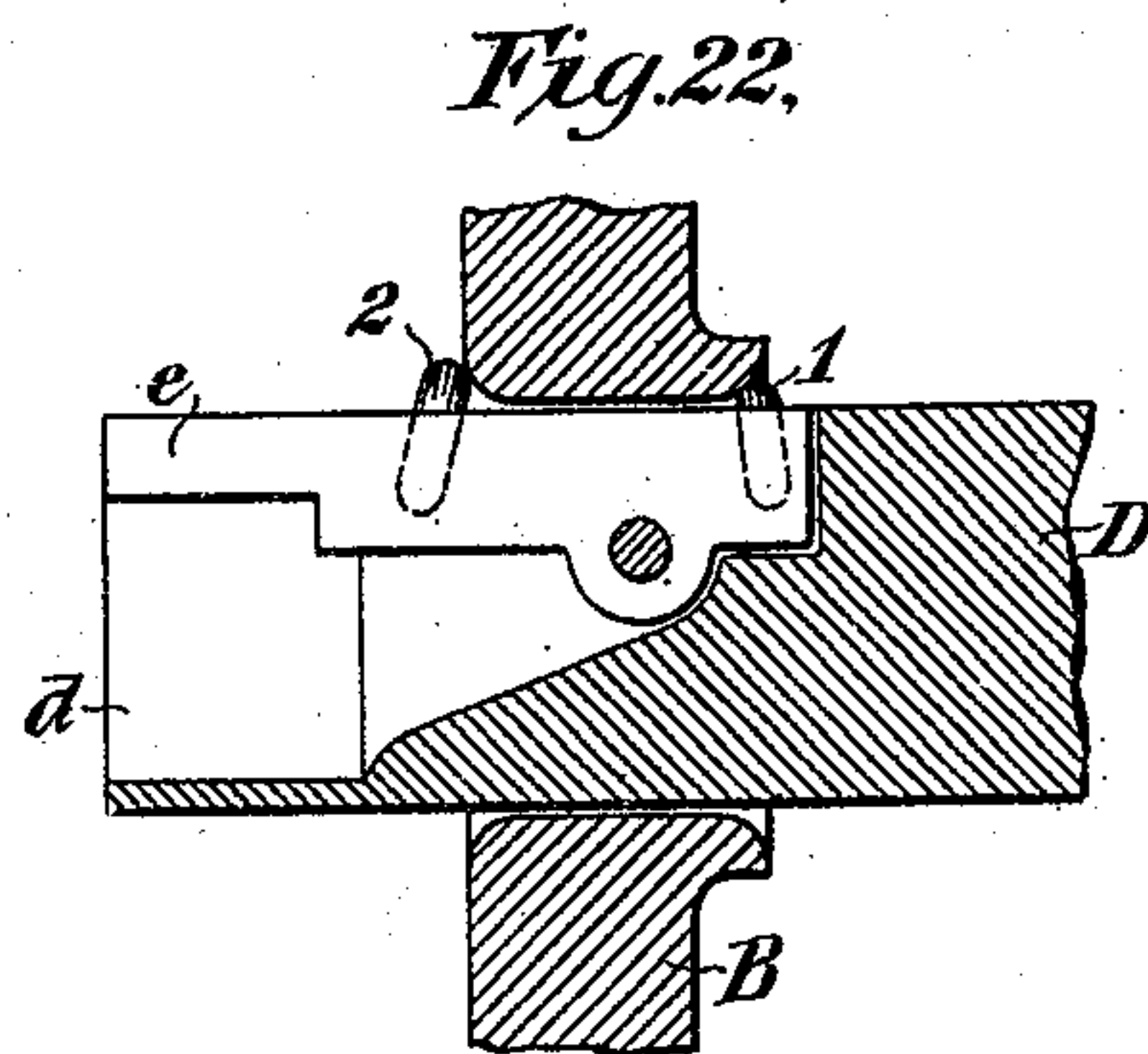
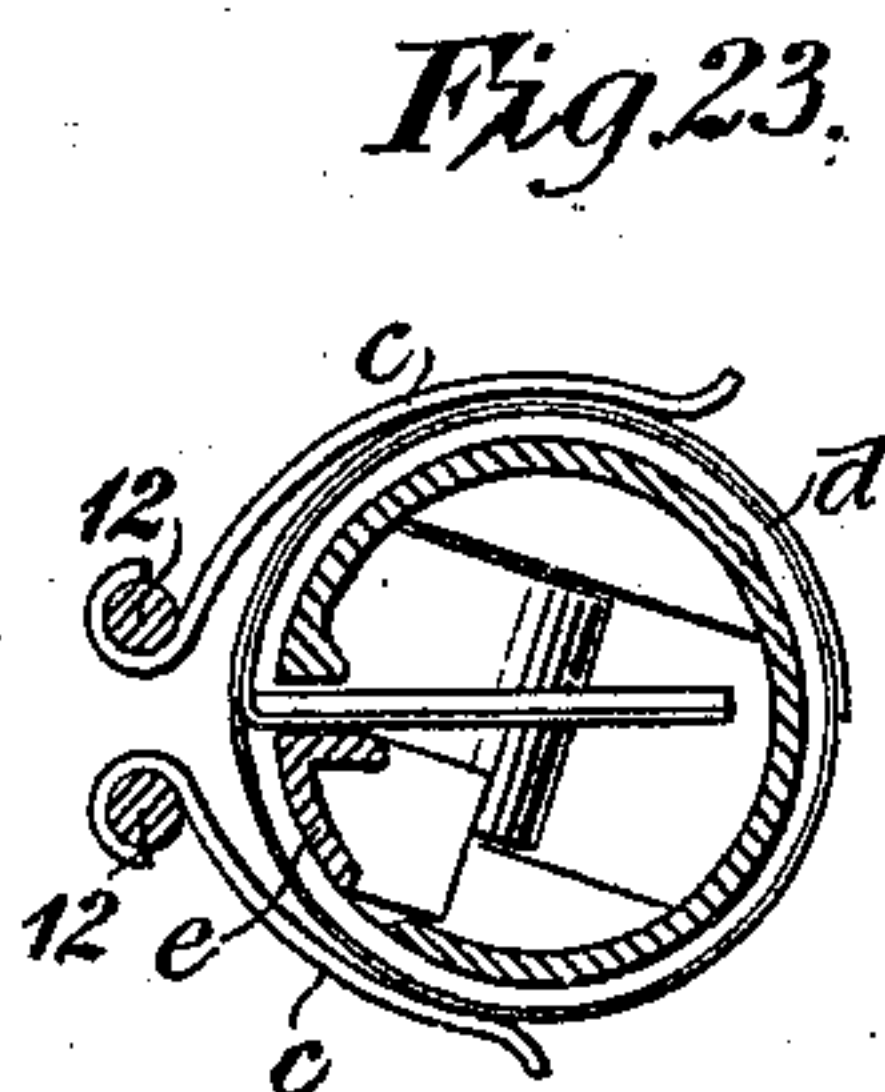
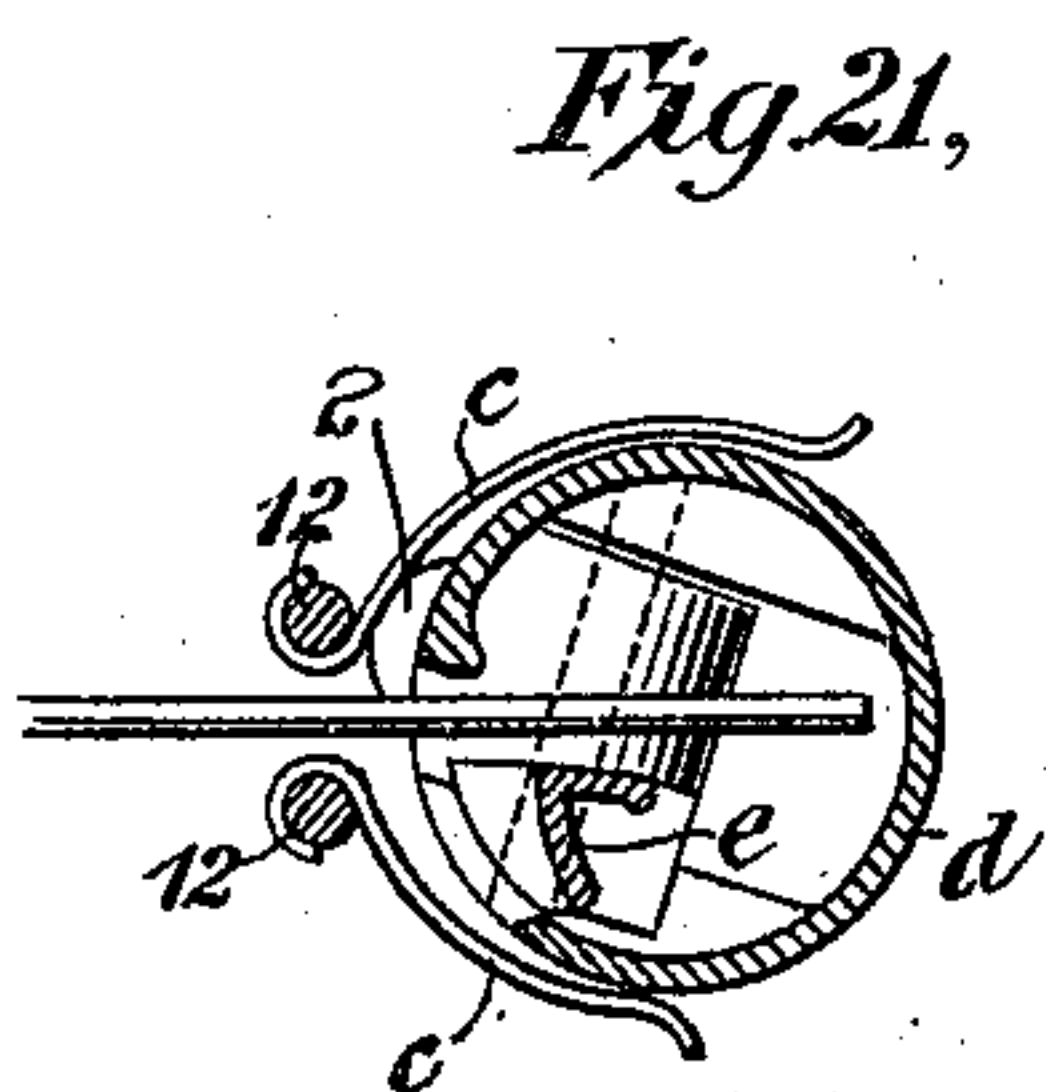
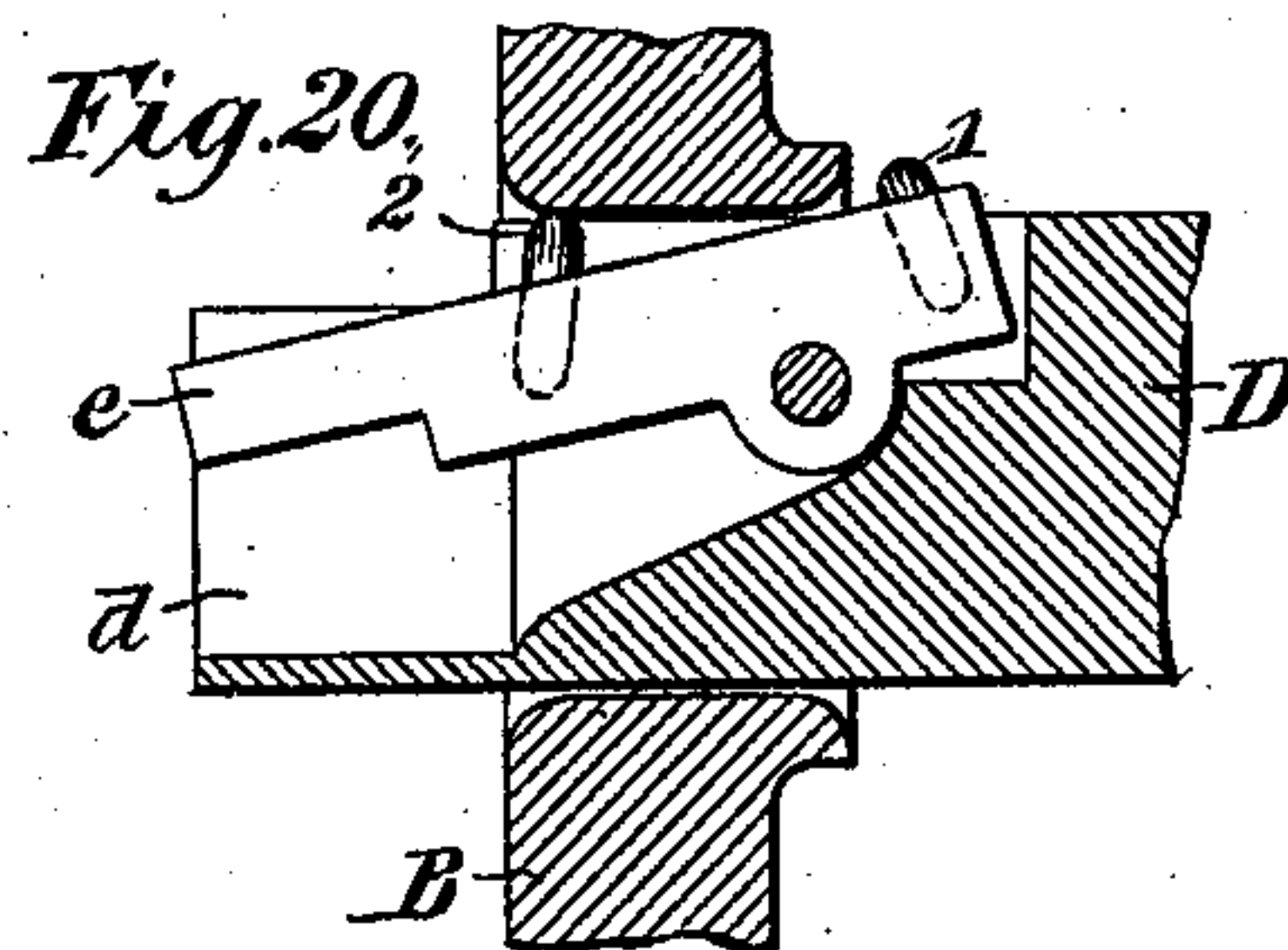
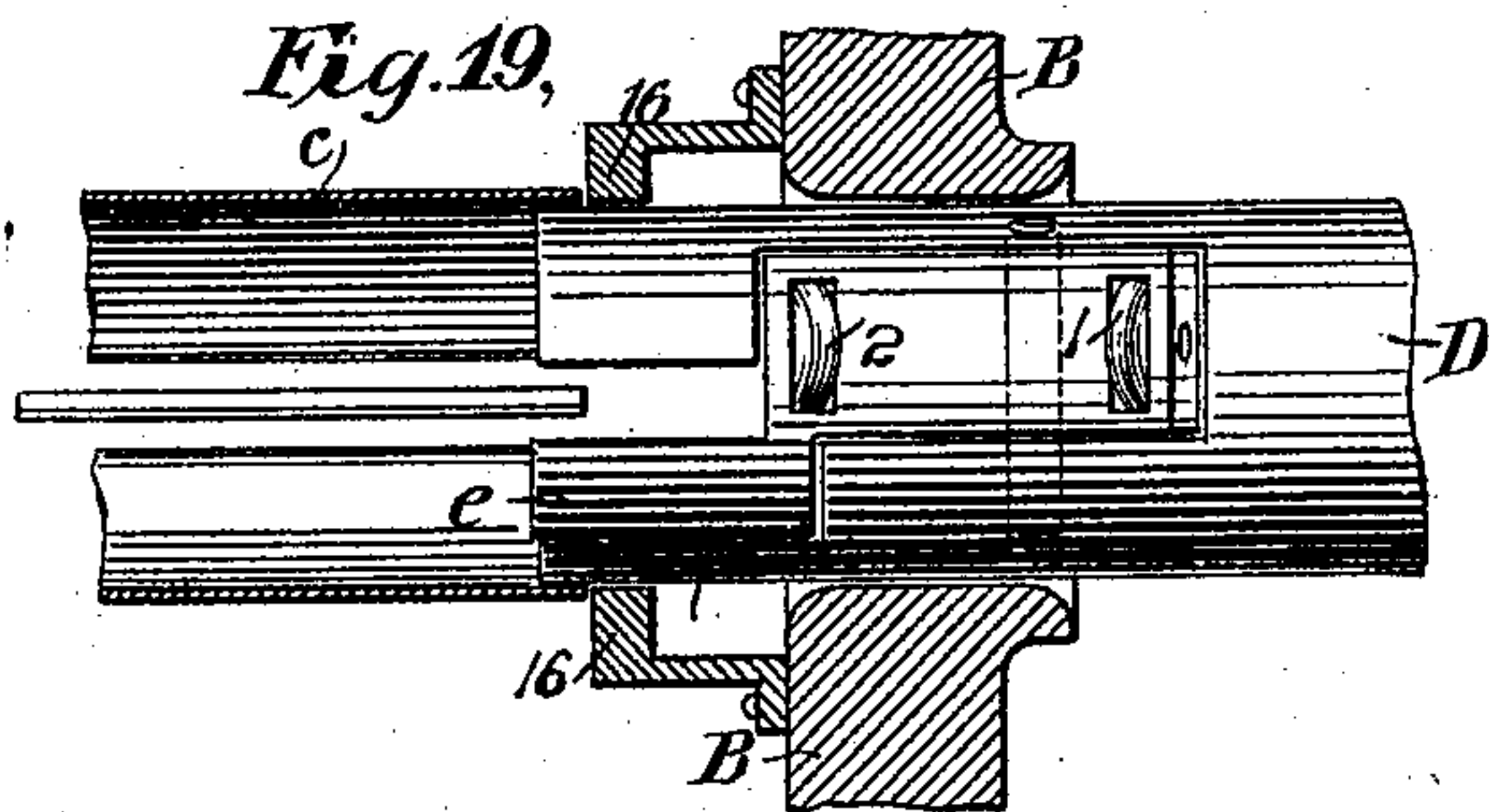
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# UNITED STATES PATENT OFFICE.

LUTHER C. CROWELL, OF BROOKLYN, ASSIGNOR TO ROBERT HOE, STEPHEN D. TUCKER, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF NEW YORK, N. Y.

## NEWSPAPER-WRAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 486,090, dated November 15, 1892.

Application filed April 26, 1892. Serial No. 430,658. (No model.)

*To all whom it may concern:*

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

The object of the present invention is to provide an improved machine of that class used for wrapping newspapers and other publications and generally known as "newspaper-wrapping machines," and especially to increase the speed at which such articles may be wrapped and provide a simple and efficient wrapping-machine of high capacity.

In a prior application, Serial No. 401,842, filed August 6, 1891, I have described and claimed, broadly, a machine for wrapping newspapers and other publications in which the paper and wrapper are wound or rolled upon a central core, the pasted wrapper secured, and the wrapped paper removed from the core either by pushing the paper longitudinally from the core or withdrawing the core from the paper.

The present invention relates to machines operating on this principle, in which the paper is removed from the core by withdrawing the core from the paper, and in the machine embodying my invention in its preferred form the core is formed in two parts, arranged opposite each other, so that the paper is supported at opposite sides and delivered by withdrawing the two parts of the core in opposite directions, a proper support of the paper during the wrapping operation being thus provided without extending the core but a short distance inside the paper, and a small outward movement of the two parts of the core releases the paper. Many of the features of construction forming my invention, however, may be embodied in a machine having but a single-part core. It is evident that the construction of machines operating on this principle may be varied widely and that the core may be of any suitable form, and various means be used for securing the proper winding or rolling of the paper and wrapper there-

on. I prefer, however, to form the core of grippers by which the paper and wrapper are held at opposite sides, and to wind the paper and wrapper upon the grippers against the pressure of a wiper, preferably by rotating the grippers, the leading end of the wrapper being held directly by the grippers or between layers of the partially-wound paper, and means are preferably provided for opening and closing the grippers to seize and release the papers, although the grippers may be stationary relatively to each other and the paper or paper and wrapper between the grippers be seized by their rotation. The grippers are preferably so constructed and a spring-wiper employed and so positioned relatively to the grippers that the paper and wrapper are wound closely upon the core formed by the grippers and the paper supported firmly thereby during the operation of wrapping, the size of the wrapped product being thus determined by the size of the core. With a stiff product, however, this construction may be varied, so that the paper is not wound closely upon the grippers, but is wound and the wrapper secured by the pressure of the paper against the wiper produced by the resistance of the paper to bending; or the paper may be wound closely upon the grippers as it is advanced at substantially the same rate of speed by feeding devices and the wiper pressed against the paper only after the paper is nearly or completely wound, the pasted end of the wrapper thus being secured. The paper may be wrapped in circular form and thus delivered, or flattening mechanism of any suitable form may be used with the wrapping mechanism, or the grippers may be constructed to produce an approximately-flat product.

It is evident that my improved wrapping mechanism may be used in a machine in which either or both the paper to be wrapped and pasted wrapper are fed to the machine by hand, and a practical machine may thus be constructed, especially for wrapping magazines and similar publications; but it will be understood that in practice the machine will preferably be made automatic by combining therewith feeding mechanisms for both the papers to be wrapped and wrappers and past-



ing devices for the latter. Thus the wrapping mechanism may be combined with the delivery mechanism of a printing-press or with a folding-machine of any of the common forms, so that the papers are taken directly therefrom, wrapper feeding and pasting mechanisms being added, so that the paper is automatically wrapped and delivered, or wrapper and paper feeding devices of any suitable form may be combined with the wrapping mechanism to form an independent paper or pamphlet wrapping machine.

In the accompanying drawings, forming a part of this specification, I have shown a machine of the preferred construction for carrying out my invention and certain modifications thereof, and a full description of the same will now be given in connection with the drawings, and the method and features of construction forming my invention specifically pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a vertical section taken inside the frame on the line 2 of Fig. 5. Fig. 3 is a section on the line 3 of Fig. 5. Fig. 4 is a central vertical section between the grippers on line 4 of Fig. 5. Fig. 5 is a vertical longitudinal section taken centrally through the grippers. Fig. 6 is a vertical side elevation of the wrapping mechanism. Fig. 7 is a plan of the complete machine. Fig. 8 is a horizontal section taken centrally through the grippers. Fig. 9 is a vertical sectional elevation of the wrapping mechanism, the parts being shown in the position they occupy just before delivering a wrapped paper. Fig. 10 is a similar view showing the grippers withdrawn to deliver the paper. Figs. 11, 12, and 13 are detail cross-sections taken between the grippers and showing the parts in different positions during the operation of wrapping and delivering a paper, Fig. 11 showing the parts at the end of the first rotation of the grippers, Fig. 12 at the end of the second rotation, and Fig. 13 after the delivery of the paper. Fig. 14 is a perspective view of the product. Figs. 15 to 18 illustrate a machine employing a wiper rotating about the grippers. Fig. 15 is a vertical sectional side elevation. Figs. 16, 17, and 18 are detail cross-sections of the same, taken between the grippers and showing the parts in different positions, Fig. 16 showing the parts in the position they occupy at the beginning of the first rotation, Fig. 17 at the beginning of the second rotation, and Fig. 18 near the end of the third rotation and after the paper has been delivered. Figs. 19 to 23 show a modified form of grippers, forming a collapsible core. Fig. 19 is a sectional elevation showing one pair of the grippers open and core collapsed to receive the paper. Fig. 20 is a horizontal section of the same. Fig. 21 is a cross-section of the same. Fig. 22 is a view similar to Fig. 20, showing the gripper closed and core expanded, and Fig. 23 is a cross-section of the same, showing the wrapped paper

on the core. Figs. 24 to 27 illustrate a machine employing grippers consisting of two fingers stationary relatively to each other. Fig. 24 is a vertical sectional side elevation. Figs. 25, 26, and 27 are vertical cross-sections of the same, taken between the grippers and showing the parts in different positions, Fig. 25 showing the grippers as the paper is being received, Fig. 26 as the first rotation is commenced, and Fig. 27 during the second rotation. Fig. 28 shows a core consisting of a hollow cylinder having an opening on one side to receive the paper the edges of which form the grippers.

Referring to said figures, A is the base-plate, in which are mounted at opposite ends of the machine vertical frames B C, which support the operating parts of the machine and are preferably adjustable on the base-plate A, so as to accommodate papers of different widths, the frames B C being shown as adjustable on the base-plate A by slots 10 and held in position thereon by bolts 11, although any other suitable means may be used for this purpose. The frames B C are shown as each formed of three vertical standards, in which the shafts and other parts of the wrapping mechanism are mounted, and this forms a very simple and efficient framework, providing means for holding the different parts of the mechanism in proper position and permitting their adjustment; but it will be understood that its form may be varied as desired.

In the upper part of the machine shafts D E are mounted in the frames B C, these shafts being mounted to rotate and slide in the frames and carrying at their inner ends the grippers *a b*, by which the paper and wrapper are seized and held during the operation of wrapping. The inner standards of the frames B C are mounted a sufficient distance apart to permit of wrapping the paper between them, and into the space between these two standards the grippers *a b* project at opposite sides. In this space, between the inner standards of the frames, is mounted, also, the wiper *c*, coacting with the grippers *a b* in winding the paper and wrapper thereon, this wiper being shown in the present case as consisting of two spring-plates mounted, respectively, above and below the grippers and carried by rods 12, mounted in the inner standards of frames B C. The paper and wrapper are fed to the wrapping mechanism between the two plates forming the wiper *c* by a pair of feeding-rolls F. On the opposite side of the grippers *a b* from the wiper *c* and below the gripper, so as to allow the wrapped paper to be delivered there-to by falling from the grippers as it is released, is mounted the flattening mechanism, which consists in the form shown of two sets of converging tapes G, carried by rolls 13, mounted in brackets 14, adjustably secured to the inner standards of frames B C. Below the shafts D E is mounted a shaft H, which forms the driving-shaft of the machine and extends entirely through the frames B C.



As the construction and arrangement of the frames B C, shafts D E, and the grippers and operating mechanism therefor are identical at both sides of the machine, the same references will be used for corresponding parts at the opposite ends and a single description will be understood to apply to both.

The grippers *a* are bent at obtuse angles, and at their angles are pivoted in the end of the shaft D on opposite sides, so as to form when closed a cylindrical core, practically a continuation of the shaft. Each of these grippers carries at its outer end a bowl 1 and on the opposite side of the pivot a bowl 2, these bowls being mounted so as to rotate freely and having a surface rounded longitudinally of the grippers. The opening in the inner standard of frame B through which the shaft and grippers slide is made of a size sufficient to permit the passage of bowls 2, but to hold the grippers partially closed during their passage, and this standard is provided on its inner side with a ring 15 of less diameter than the opening in the standard, in passing which the bowls are acted upon so as to press the grippers *a* close together and grip the paper and wrapper tightly as they are received by the grippers, the grippers moving outward at the same time, so that a slight tension is put upon the paper and wrapper. The bowls 1 are acted upon by the rounded rear edges of the opening in the standard to throw the grippers wide open for the reception of the paper and wrapper as the shaft D and grippers *a* reach their innermost position, as shown in Figs. 5 and 6.

While it may be found practicable to deliver the wrapped paper by withdrawing the grippers in opposite directions without the aid of strippers, I preferably employ strippers 16, which in the construction shown are carried by arms 17, which extend longitudinally of the shaft D, lying in grooves formed therein on opposite sides of the shaft, and which are provided with projections 18 at their rear ends, which lie outside the surface of the shaft D and rotate within a groove formed by a ring 19, secured on a bracket 20 on the central standard of frame B. By this construction the stripper 16 is held in position while the shaft D is withdrawn, the grooves in the shaft permitting the shaft to slide backward and forward while the arms 17 are held in position by the projections 18 inside ring 19. The ring 19 is preferably made movable, as shown, so that the arms 17 and strippers 16 may readily be removed.

The following means are provided for reciprocating and rotating the shaft D: A collar 21, formed on the shaft, as shown, or secured thereto, rotates in a grooved segmental sleeve 22, which carries a pivoted bowl 23, running in a cam-groove 24 in a cam-cylinder I, mounted on shaft H and rotating therewith. The sleeve 22 is carried and held in position with the bowl 23, within the cam-groove 24, by means of an arm 25, pivoted to

the frame, as shown in Fig. 8, and slotted so as to permit the sleeve to move to and fro freely with the shaft D, the rotation of the cam I with the shaft H thus operating, through sleeve 22 and collar 21 on the shaft D, to reciprocate the latter with the grippers *a*. The shaft D is rotated from the driving-shaft H by gears 26 27, the shaft D being splined in gear 26 and the latter being held in position to engage gear 27 by a bracket 28, mounted on the frame. The gears 26 27 may be proportioned so as to give any desired number of rotations to the shaft D and the grippers before they are withdrawn for the delivery of the wrapped product. As shown, four rotations of the shaft and grippers are made for each rotation of the shaft D, the paper being wrapped and grippers withdrawn during the time of two rotations and returned during the following two.

The feeding-rolls F and belts G are driven from a large gear 29 on shaft H, as follows: The gear 29 drives the lower feeding-roll F through an intermediate gear 30 and gear 31 on the shaft of the feeding-roll, and the rolls are geared directly together at their opposite ends by gears 32. The gear 29 also drives one of the belt-rolls 13 through intermediate gear 33 and gear 34 on the shaft of the roll, and the corresponding roll 13 for the other belt is driven directly from this roll by gears 35.

The machine will operate to wrap papers varying somewhat in width without adjustment of any of the parts, as it is evident that the grippers *a b* may seize the paper and wrapper by surfaces of greater or less extent, and with the grippers constructed as shown a considerably narrower paper than that shown may be wrapped. It is preferable, however, that the machine should be constructed so that the range of the widths of paper which may be wrapped by the machine shall be as large as possible, and I have shown the machine adjustable, as follows, to take papers of greater width than that shown.

As above stated, the vertical end frames B C are mounted adjustably on base-plate A, and it is necessary only to provide means by which the parts shall be properly driven in their different positions to complete the adjustability of the machine. In the construction shown this object is attained by mounting the gears and cams to slide upon the shaft H and by extending the shafts of the belt-rolls 14 and feeding-rolls F outside the inner standards of frames B C, on which they are mounted, so that these frames may be separated further and the belts and feeding-rolls still properly supported. As the shafts D E, grippers, and other parts of the wrapping mechanism at opposite ends of the machine are independent of each other and carried entirely by the supporting-frames B C, no special construction of these parts is necessary for the adjustability of the machine.

The operation of the machine is as follows: As shown in Figs. 4 to 8, a paper *x* and wrap-



per *y* are just being received by the grippers, the wrapper *y* being preferably a little wider than the paper, as shown, in order to overlap and protect the edges of the latter. In this position of the parts the shafts D E are in their innermost position, the bowls pressing against the outer sides of the inner standards of the frames B C, so as to open the grippers *a b* to their fullest extent, and the bowls 2 lie inside the collars 15. As will be seen from Fig. 7, the cam-grooves 24 are so formed that the outward movement of the shafts D E is now just about to commence. As the cams I and shafts D E, therefore, rotate forward from this position the shafts D E are withdrawn slightly, and just as the leading ends of the paper and wrapper reach the position shown in Fig. 4 the bowls 2 on the grippers *a b* come in contact with the collars 15 on the frames B C, and as these bowls pass the collars the grippers *a b* are closed together tightly upon the paper and wrapper and seize their leading ends as the movement of rotation commences, the paper and wrapper then being wound about the core formed by the closed grippers and against the spring-wiper *c*. As the shafts D E rotate they also are drawn outward in opposite directions, sliding over the bars 17, carrying the strippers 16, which are held in place by the projections 18, within the collar 19, as previously described, the pivotal slotted connection between the arms 25 and the sleeve 22 permitting the latter to move freely with the shafts D E while being held in position with the bowls 23 in the cam-grooves 24.

As the rotation of the cams and shafts continues and the paper and wrapper are wound about the grippers the shafts and grippers are withdrawn by the cams, so that the bowls 2 pass the collars 15 and then move along the inner surface of the openings in frames B C, the grippers then being opened slightly, as shown clearly in Fig. 9, so as to permit them to be withdrawn from the paper as the shafts move outward, the slight withdrawal of the grippers while the paper is tightly gripped thereby serving to put a tension upon the side edges of the paper and wrapper, which smoothes them out, avoiding wrinkles. As the grippers *a b* rotate with the shafts D E the paper carried thereby is pressed against the wiper *c*, and it is evident that the paper and wrapper will thus be rolled into cylindrical form and the previously-pasted rear end of the wrapper secured by pressure between the wiper and paper supported by the grippers.

At the end of the first rotation of the grippers the parts are in the position shown in Figs. 9 and 11, with the paper wound once about the grippers and the projecting rear end of the wrapper just about to be drawn in for overlapping upon the layer of wrapper already upon the paper, the grippers at this time having been withdrawn through about half of their outward movement, the paper being held

in position against any pull of the grippers by the strippers 16.

Upon the second rotation of the grippers the rear end of the wrapper is drawn in and pressed down upon the layer of wrapper upon the paper for pasting, and at the end of this rotation the grippers are entirely withdrawn from the paper, so as to release the latter and allow it to pass to the delivery-belts G, forming the flattening mechanism. The position of the parts at the end of the second rotation of the grippers and with the paper released from the grippers and just about to be delivered is shown in Figs. 10 and 12.

The spring-plates *c*, forming the wiper, being placed on the opposite side of the grippers from the flattening mechanism, tend to return to their normal position as the grippers are withdrawn and by their return movement force the wrapped paper outward, so as to assist in its delivery to the belts G, as shown in Figs. 12 and 13. The wrapped paper thus delivered from the grippers to the belts G in circular form is flattened thereby and delivered as the flat product of Fig. 14.

Upon the further rotation of the cams I and shafts D E after the delivery of the wrapped paper the shafts D E and grippers *a b* are returned to the position shown in Fig. 5, while the shafts D E are making the next two rotations, and the grippers thus opened for receiving another paper and wrapper by the engagement of the bowls 1 with the outer edges of the openings in the inner standards of frames B C, and thus the operation is repeated.

While I have shown a construction in which the wrapping operation is performed in two rotations of the grippers, the paper being rolled during one rotation of the grippers and the wrapper pasted down during the second rotation, it will be understood that the construction may readily be varied, so that the paper shall be rolled during more than one rotation and a longer paper be wrapped or the paper be wrapped in smaller compass, so as to be delivered as a closely-rolled circular product, the size of the core formed by the grippers being varied, as desired. If a round product be desired, as is usual with thick pamphlets, the flattening mechanism will be omitted and the wrapped pamphlet be finally delivered directly from the grippers by dropping it into a box. I have shown the wrapper as fed in simultaneously with the paper, so that the leading ends of both the paper and wrapper are seized by the grippers; but it will be understood that the wrapper may be fed in after the paper is partially wrapped and its leading end held between two layers of the paper on the grippers.

While I prefer to rotate the grippers and employ a stationary wiper, as in the construction thus far described, I may use a construction in which the paper and wrapper are



is expanded and contracted by the gripping and releasing movements of the gripper *e*, and the paper may be wound tightly upon the core and loosened by the collapsing of the core when the gripper is to be withdrawn from the wrapped paper for delivery. In this construction the cylinders or stationary grippers *d* are rigidly secured to the shafts D E of the construction previously described, and the movable grippers *e*, coacting therewith, are pivoted thereto, substantially as in the construction previously described, and operated by similar means, the gripper *e* being provided with the bowls 1 and 2, by which the gripper is actuated in one direction or the other as the shafts D E move through the inner standards or frames B C. It is necessary, however, that the movements of the shafts D E should be modified, and the form of the cam-grooves 24 will be changed accordingly. The construction and operation of the parts at opposite ends of the machine being identical, it will be understood from a description of one end, as shown in Figs. 19 to 22. The parts are so timed and the bowls 1 2 so positioned relatively to the frame B that the leading ends of the paper and wrapper pass inside the cylinder *d* just before the shaft D and grippers reach their innermost position, and while the movable gripper *e* is held depressed by the engagement of the bowl 2 with the inner side of the openings in frame B, this position of the parts being shown in Figs. 19 to 21. The shaft D being now advanced inward slightly by the cam-groove 24, the bowl 2 passes off the inner edge of the opening in frame B, and as the shaft reaches its innermost position the bowl 1 engages the outer edge of the opening in frame B and the inner end of the gripper is rocked upward and outward, so as to complete the periphery of the cylinder *d* and grip the paper and wrapper firmly against the edge of the same, this position of the parts being shown in Figs. 22 and 23. The cam-groove 24 is so shaped that the shaft D remains in its innermost position during the winding of the paper and wrapper for one or more rotations, according to the length of the paper to be wrapped, and as the winding of the paper and wrapper and securing of the wrapper are completed the shaft D is withdrawn, and as the bowl 2 passes inside the opening in the frame B and the bowl 1 is released from the outer edge of said opening the gripper *e* is thrown inward and downward to release the paper, and this withdrawal of the gripper reduces the periphery of the cylinder *d*, so as to loosen the paper and wrapper upon the cylinder, thus allowing the latter to be withdrawn readily. The stripper 16 may be supported directly on the frame B, as shown in this construction.

In Figs. 24 to 27 I have shown a construction in which the grippers are stationary relatively to each other, the seizing of the paper being secured by the rotation of the grippers

with the paper between them. In this construction the grippers consist of fingers *f*, of any suitable form, placed at the proper distance apart to permit the leading ends of the paper or paper and wrapper to be advanced between them by the feeding mechanism and to seize the same as they are rotated or the wiper rotated about them. In the construction shown these fingers *f* are mounted rigidly on the ends of the shafts D E, and the operation of winding and withdrawal may be identical with that previously described in connection with Figs. 1 to 14, except that the opening and closing movements of the grippers are omitted. These fingers *f* are shown, however, as forming a core of such size relatively to the wiper *c* that the paper and wrapper are not pressed against the wiper during the entire operation of wrapping, but only on the last rotation, during which the winding of the paper is completed and the wrapper secured by pressing down the pasted rear end on the previous layer of wrapper. In this construction the paper and wrapper are fed forward by the feed-rolls F at substantially the same rate of speed as they are wound by the rotation of the gripper-fingers *f*, so that the paper and wrapper are wound closely on the gripper-fingers, the upper roll F being driven by friction only, so that the paper may be drawn in more rapidly on the second rotation of the grippers.

In Figs. 24 and 25 the parts are shown in the position they occupy when the paper and wrapper have been fed between the gripper-fingers *f* and the operation of wrapping is about to commence. As shown in Fig. 26, the paper and wrapper are being seized by the rotation of the fingers and the winding of the paper and wrapper has just commenced. As shown in Fig. 27, the winding of the paper is just being completed and the rear end of the wrapper is just about to be drawn in and pressed against the wiper for pasting when the wrapped product will be delivered as in the constructions previously described. It is evident that with this construction of gripper-fingers, forming a small core, a stiff magazine or other publication may be wrapped without being supported directly by the core or its rear end being held by feeding devices during the operation of wrapping, the pressure of the paper against the wiper produced by the resistance of the paper to bending being depended upon to secure the circular form of the product and press down the pasted end of the wrapper for pasting.

In Fig. 28 I have shown a desirable form of core for forming a circular or flattened product, this consisting of hollow cylinders *g*, carried rigidly by the shafts D E, as in the case of the fingers *f*, the cylinders being provided on one side with slots, through which the leading ends of the paper and wrapper are fed into the cylinders, and the edges of which form the grippers by which the paper and wrapper are seized as the cylinders ro-



wound about the grippers during the process of wrapping by rotating the wiper about them, and I have shown such a construction in Figs. 15 to 18. In this construction the gears 26 27, connecting shafts D E with shaft H, are omitted and gears 36 are carried by the shaft H inside the inner standards of the frames B C, these gears 36 meshing with gears 37, mounted concentrically with the shafts D E and rotating freely in bearings in the frames B C. These gears 37 may be mounted and the collar 15 of the construction previously described be formed in any suitable manner. A simple construction is shown, however, in which the gears 37 are carried by sleeves 38, mounted in openings in the frames B C, the inner surface of the sleeve forming the surface over which the bowls 1 2 move during the longitudinal movement of the grippers, the collar 15 being formed upon the inner ends of the sleeves, as shown. A single wiper will preferably be used, this wiper consisting of a spring-plate *c*, as in the construction previously described, and being carried by a rod 39, secured at opposite ends to the gears 37, so that the gears are thus held in position in the frames B C, and the rod and wiper are carried about the grippers by the gears. The shafts D E are moved longitudinally by means of the bowls 23 and cam-grooves 24, as before, the cam-grooves, however, being shown as timed so that the paper is wrapped and shafts withdrawn during the time of three rotations of the wiper, and the shafts returned to position by a quicker movement during a single rotation. In this construction the pivoted bowls 23 may be secured to the shaft by the stud 40, as shown, and the collar 22 and arms 25 be omitted. The operation of this construction is substantially the same as that of the machine previously described, and will be understood from a brief general description in connection with Figs. 15 to 18. The feeding and wrapping mechanisms are shown as arranged so that the paper and wrapper are advanced through the grippers and beyond them substantially a half circumference of the core formed by the grippers before the wrapping operation commences, thus making the length of the paper to be carried about the core by the wiper equal only to one-half of the circumference of the core, the paper being delivered, preferably, in circular form. It will be understood, however, that in this construction, as in that previously described, the leading end of the paper and wrapper may be advanced between the grippers only sufficiently to be seized by the latter and the rear end of the paper then wound about the core one or more times by the wiper, the feeding mechanism being so timed as to feed the paper forward at the same or a slightly-higher speed than that at which the paper is taken up by the rotating wiper.

In Fig. 15 the grippers are shown as in their innermost position and just about to be closed to seize the paper and wrapper, as previously

described in connection with Fig. 5, except that, as described above, the paper and wrapper are advanced beyond the grippers a half circumference of the core formed by the closed grippers. As shown in Fig. 16, the paper and wrapper have been seized by the grippers *a*, and the wiper *c* has just commenced to wind the paper and wrapper about the grippers. As the wiper winds the paper and wrapper about the grippers during the first rotation, the paper is fed forward at substantially the same or a slightly higher speed by the feeding-rolls F, and at the end of the first rotation of the wiper, when the paper has been rolled once about the grippers, the two ends lie at opposite sides thereof and the rear pasted end of the wrapper is just about to be lapped over the previous layer of wrapper on the paper and pressed down by the wiper for pasting, all as shown in Fig. 17. During the second rotation the wrapper is secured and the wiper then makes another rotation around the wrapped paper, so as to secure the wrapper more firmly upon the paper. Meanwhile the shafts D E have been withdrawn by the action of the cam-grooves 24, as in the construction previously described, and at the end of the third rotation the wrapped paper is released and delivered. During the next rotation of the grippers the shafts D E are returned to position to seize the next paper by the action of the cam-grooves 24, and at the same time the next paper and wrapper are fed forward by the feeding-rolls F, as shown in Fig. 18, and at the end of this rotation the parts are again in the position shown in Fig. 16, with the leading ends of the paper and wrapper advanced beyond the grippers, as previously described.

It is evident that the construction and method of operation of the grippers used for holding the paper during the wrapping operation may be varied very widely, and that while in the constructions thus far described I have shown the grippers as composed of two parts, both of which are movable for the gripping and releasing operation, (and I prefer this construction, as it gives a large opening for the paper with a slight movement of the grippers,) this is not necessary; but constructions may readily be devised in which one of the parts is stationary and the other movable, or in which the grippers do not open and close, but both parts retain fixed positions relatively to each other, and the gripping action is secured by the rotation of the grippers inside the wiper or of the wiper outside the grippers.

In Figs. 19 to 23 I have shown a construction in which the leading ends of the paper and wrapper are received within a hollow cylinder *d*, forming a stationary gripper, and gripped against the edge of the slot through which the paper passes by a gripper *e*, movable relatively thereto, and which forms a section of the periphery of the cylinder, so that a collapsible core is thus formed, which



tate inside the wiper or the wiper outside the cylinders. While I prefer to use two pairs of grippers mounted opposite each other, so as to seize and hold the paper at opposite sides, the required movement of the grippers being reduced thereby, as a proper support of the paper may be afforded with short grippers, it is evident that I may omit the parts of the wrapping mechanism at one end of the machine shown and use one pair of grippers and operating devices therefor, the wrapped paper being held in position during the withdrawal of the grippers by the stripper 16 and delivered as previously described, the only change required from the construction shown being to increase the length of the grippers in accordance with the width of the paper to be wrapped, so as to support the paper properly.

It is obvious that many other modifications may be made in the construction of my preferred form of core, consisting of grippers by which the paper and wrapper are held, and that other means may readily be devised for advancing and withdrawing the grippers to receive and deliver the paper without departing from my invention; and I am not to be limited to the specific form of any of the constructions shown.

What I claim is—

1. In a machine for wrapping newspapers and other publications, the combination of a core, means for winding the paper and wrapper upon the core and securing the wrapper, and means for removing the wrapped paper from the core by withdrawing the core from the paper, substantially as described.

2. In a machine for wrapping newspapers and other publications, the combination of a core formed of two parts arranged opposite each other, means for winding the paper and wrapper upon the core and securing the wrapper, and means for withdrawing the two parts of the core in opposite directions to release the paper, substantially as described.

3. In a machine for wrapping newspapers and other publications, the combination of a collapsible core, means for winding a paper and wrapper upon the core and securing the wrapper, means for removing the wrapped paper from the core by withdrawing the core from the paper, and means for expanding and contracting the core to loosen the paper for the withdrawal of the core, substantially as described.

4. In a machine for wrapping newspapers and other publications, the combination of a collapsible core provided with grippers for seizing a paper, means for winding the paper and wrapper upon the core and securing the wrapper, means for withdrawing the core to release the wrapped paper, and means whereby the grippers are closed to seize the paper and the core expanded and the grippers opened and core contracted to release and loosen the wrapped paper for the withdrawal of the core, substantially as described.

5. In a machine for wrapping newspapers and other publications, the combination of grippers, means for winding a paper and wrapper into tubular form while held by the grippers, and means for withdrawing the grippers from the paper, substantially as described.

6. In a machine for wrapping newspapers and other publications, the combination of grippers, means for winding a paper and wrapper into tubular form while held by the grippers, means for withdrawing the grippers from the paper, and means for opening and closing the grippers to seize and release the paper, substantially as described.

7. In a machine for wrapping newspapers and other publications, the combination of grippers by which the paper and wrapper are held, a wiper outside the grippers, pressing against the paper, means for rotating one of the members, and means for withdrawing the grippers from the paper, substantially as described.

8. In a machine for wrapping newspapers and other publications, the combination of grippers by which the paper and wrapper are held, means for rotating the grippers, a wiper outside the grippers, pressing against the paper, and means for withdrawing the grippers from the paper, substantially as described.

9. In a machine for wrapping newspapers and other publications, the combination of two sets of grippers by which the paper and wrapper are held at the opposite side edges, means for winding the paper and wrapper into tubular form while held by the grippers, and means for withdrawing the grippers in opposite directions to release the paper, substantially as described.

10. In a machine for wrapping newspapers and other publications, the combination of two sets of grippers arranged opposite each other, means for winding a paper and wrapper into tubular form while held by the grippers, and means for withdrawing the grippers in opposite directions to release the paper, substantially as described.

11. In a machine for wrapping newspapers and other publications, the combination of two sets of grippers arranged opposite each other, a wiper outside the grippers, pressing against the paper, means for rotating one of the members, and means for withdrawing the grippers in opposite directions to release the paper, substantially as described.

12. In a machine for wrapping newspapers and other publications, the combination of two sets of rotating grippers arranged opposite each other, a wiper outside the grippers, pressing against the paper, and means for withdrawing the grippers in opposite directions to release the paper, substantially as described.

13. In a machine for wrapping newspapers and other publications, the combination of two sets of rotating grippers arranged opposite each other, a wiper outside said grippers, pressing against the paper, means for rotating



one of the members, means for withdrawing the grippers in opposite directions to release the paper, and means for opening and closing the grippers to seize and release the paper, substantially as described.

14. In a machine for wrapping newspapers and other publications, the combination of two sets of grippers arranged opposite each other, means for winding a paper and wrapper into tubular form while held by the grippers, means for withdrawing the grippers in opposite directions to release the paper, and means for opening and closing the grippers to seize and release the paper, substantially as described.

15. In a machine for wrapping newspapers and other publications, the combination of two sets of rotating grippers arranged opposite each other, a wiper outside the grippers, pressing against the paper, means for withdrawing the grippers in opposite directions to release the paper, and means for opening and closing the grippers to seize and release the paper, substantially as described.

16. The combination, with a paper-wrapping core and means for winding a paper and wrapper upon the core, of means for withdrawing the core from the paper and a stripper coacting with the core to deliver the paper, substantially as described.

17. The combination, with a paper-wrapping core and means for winding a paper and wrapper upon the core, of means for withdrawing the core from the paper and a flattening mechanism receiving the paper as it is released from the core, substantially as described.

18. The combination, with a paper-wrapping core formed in two parts arranged opposite each other and means for winding a paper and wrapper upon the core, of means for withdrawing the two parts of the core in opposite directions to release the paper and a flattening mechanism receiving the paper as it is released from the core, substantially as described.

19. In a machine for wrapping newspapers and other publications, the combination of grippers by which the paper and wrapper are held, means for rotating the grippers, a wiper outside the grippers, pressing against the paper and curved substantially concentric with the path of movement of the grippers, and means for withdrawing the grippers from the paper, substantially as described.

20. In a machine for wrapping newspapers and other publications, the combination of two sets of rotating grippers arranged opposite each other, a wiper outside the grippers, pressing against the paper and curved substantially concentric with the path of movement of the grippers, and means for withdrawing the grippers in opposite directions to release the paper, substantially as described.

21. In a machine for wrapping newspapers and other publications, the combination of

two sets of rotating grippers arranged opposite each other, a wiper outside said grippers, pressing against the paper and curved substantially concentric with the path of movement of the grippers, means for withdrawing the grippers in opposite directions to release the paper, and means for opening and closing the grippers to seize and release the paper, substantially as described.

22. The combination, with grippers, of a wiper outside said grippers, means for rotating one of the members, a cam and connections for moving said grippers transversely to the plane of rotation, and means for opening and closing said grippers, substantially as described.

23. The combination, with grippers, of a wiper outside said grippers, means for rotating said grippers, a cam and connections for moving said grippers transversely to the plane of rotation, and means for opening and closing said grippers, substantially as described.

24. The combination, with two sets of grippers arranged opposite each other, of a wiper outside said grippers, means for rotating one of said members, cams and connections for moving said grippers transversely to the plane of rotation, and means for opening and closing said grippers, substantially as described.

25. The combination, with two sets of grippers arranged opposite each other, of a wiper outside said grippers, means for rotating said grippers, cam and connections for moving said grippers transversely to the plane of rotation, and means for opening and closing said grippers, substantially as described.

26. The combination, with grippers, of wiper c, outside said grippers, shaft H and connections for rotating one of the members, and cam I, carried by and rotating with said shaft H, and connections for moving the gripper transversely to the plane of rotation, substantially as described.

27. The combination, with two sets of grippers arranged opposite each other, of wiper c, outside said grippers, shaft H and connections for rotating one of the members, and cams I, carried by and rotating with said shaft H, and connections for moving said grippers transversely to the plane of rotation, substantially as described.

28. The combination, with grippers, of wiper c, outside said grippers, shaft H and connections for rotating the grippers, and cam I, carried by and rotating with said shaft H, and connections for moving the grippers transversely to the plane of rotation, substantially as described.

29. The combination, with longitudinally-moving shaft D and a gripper pivoted thereon, of frame B, having an opening through which said gripper moves, and bowls carried by said gripper and engaging said frame to operate the gripper, substantially as described.



30. The combination, with longitudinally-moving shaft D and a gripper pivoted thereon transversely to the shaft, of frame B, having an opening through which said gripper  
5 moves, and bowls 1 2 on said gripper on opposite sides of its pivot and engaging said frame to operate the gripper, substantially as described.

31. The combination, with longitudinally-  
10 moving shaft D, of hollow cylinder *d*, carried by said shaft and having an opening on one side, gripper *e* on said shaft, coacting with the edge of said opening and forming a collapsible section of the cylinder, and means for  
15 actuating said gripper as the shaft is moved, substantially as described.

32. The combination, with longitudinally-  
20 moving shaft D, of hollow cylinder *d*, carried by said shaft and having an opening on one side, gripper *e*, pivoted on and transversely to said shaft, said gripper coacting with the edge of said opening and forming a collapsible section of the cylinder, frame B, having an opening through which said gripper moves  
25 with the shaft, and bowls 1 2, carried by said gripper on opposite sides of its pivot and engaging said frame to operate the gripper, substantially as described.

33. A paper-wrapping core consisting of a

hollow cylinder having an opening on one 30 side to receive the end of the paper and a movable gripper for seizing the paper, pivoted transversely to the axis of the cylinder, substantially as described.

34. A paper-wrapping core consisting of a 35 hollow cylinder having an opening on one side to seize the end of the paper and a movable gripper for seizing the paper, pivoted transversely to the axis of the cylinder and forming a collapsible section of the cylinder, 40 substantially as described.

35. The combination, with two sets of grippers arranged opposite each other, of means for closing and opening the grippers to seize and release the paper, means for winding a 45 paper and wrapper upon the grippers, and means for withdrawing the grippers in opposite directions to stretch the paper as the wrapping is commenced and while the grippers are closed, substantially as described. 50

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

LUTHER C. CROWELL.

Witnesses:

THOMAS F. KEHOE,  
C. J. SAWYER.