No. 627,397. Patented June 20, 1899.

A. J. DENOYER.

PAPER BAG MACHINE.

(Application filed Oct. 21, 1898.)

(No Model.) 11 Sheets—Sheet 1.

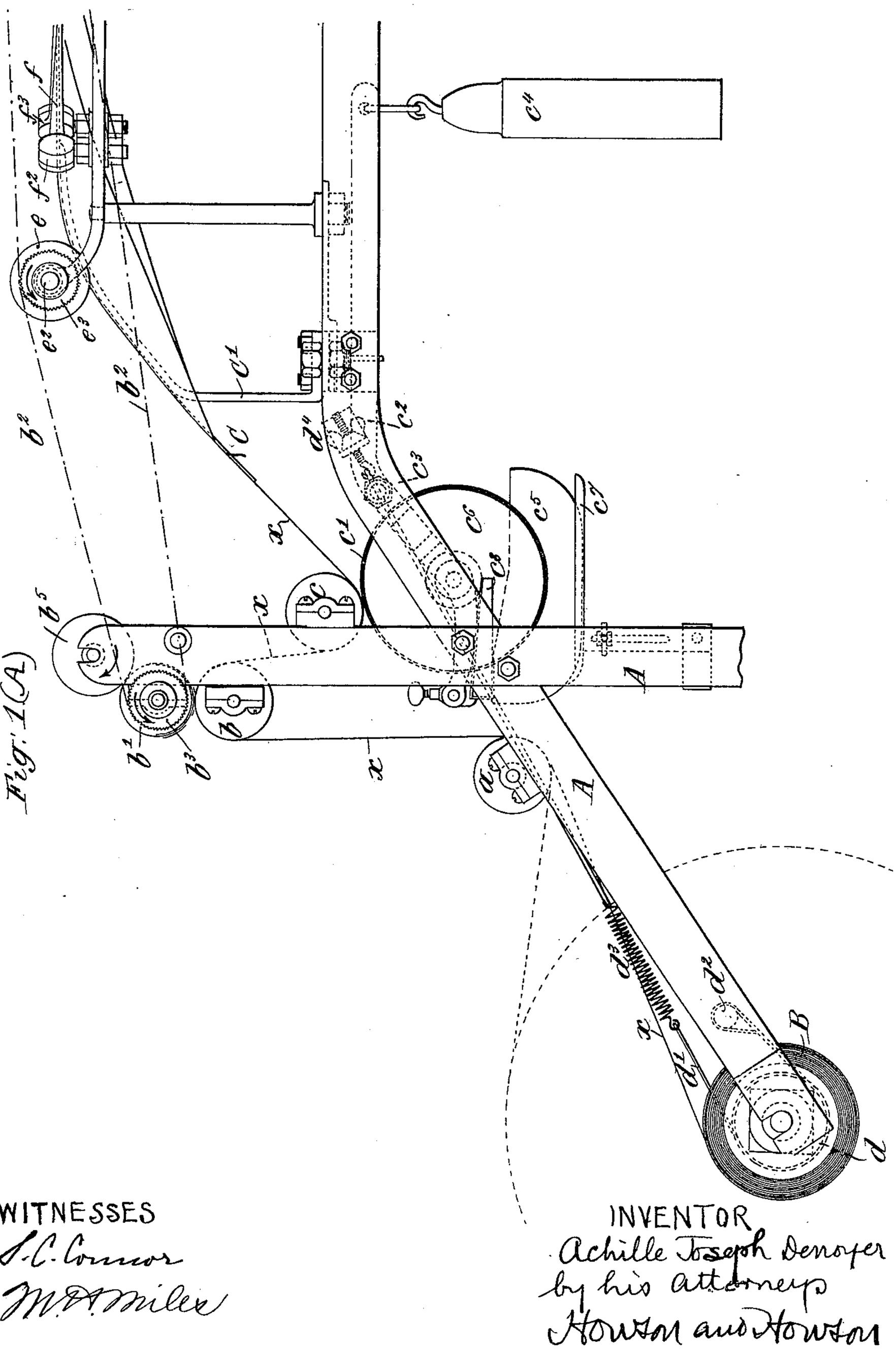

Fig. 1(A)

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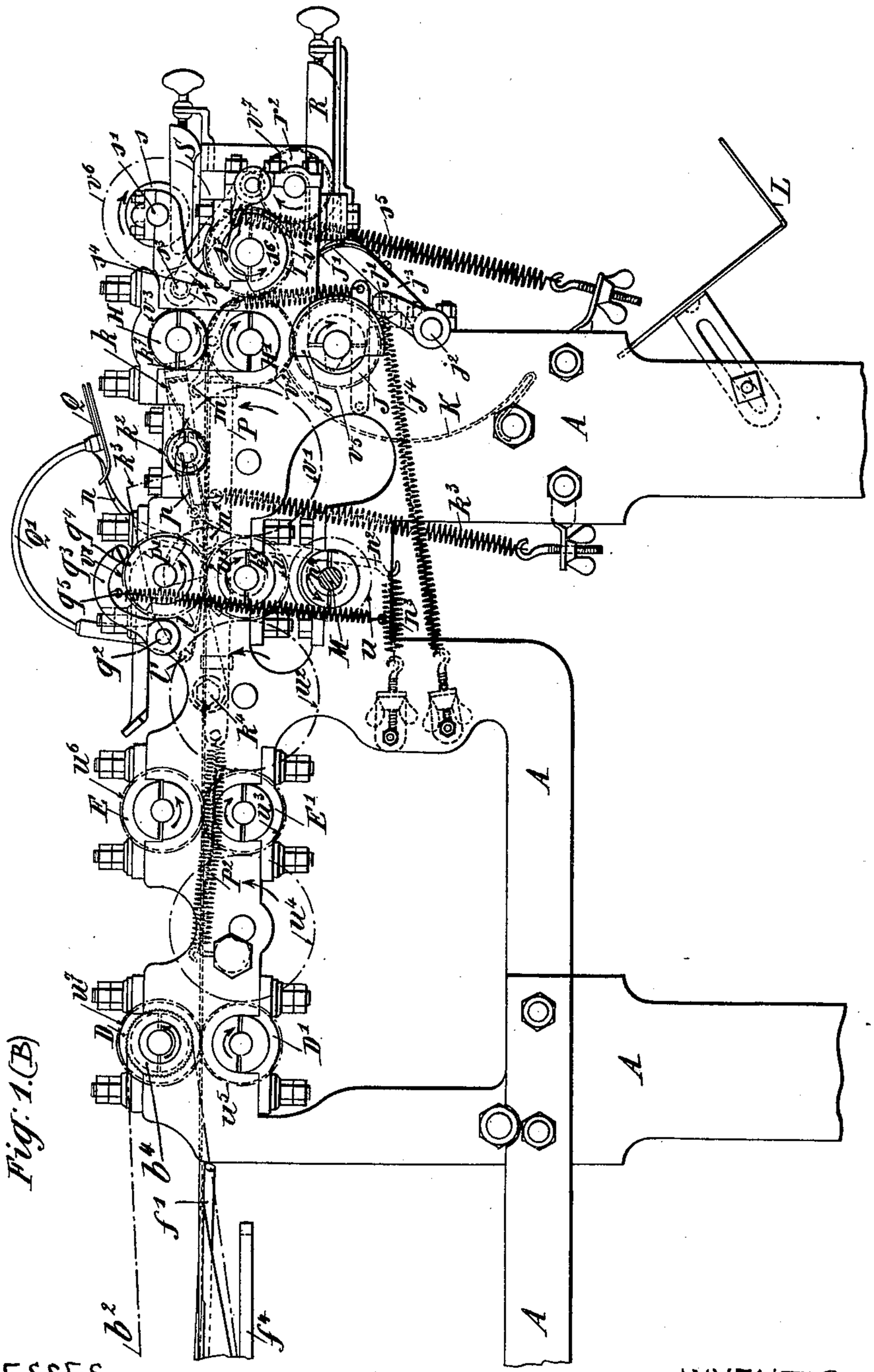

Fig. 1.(B)

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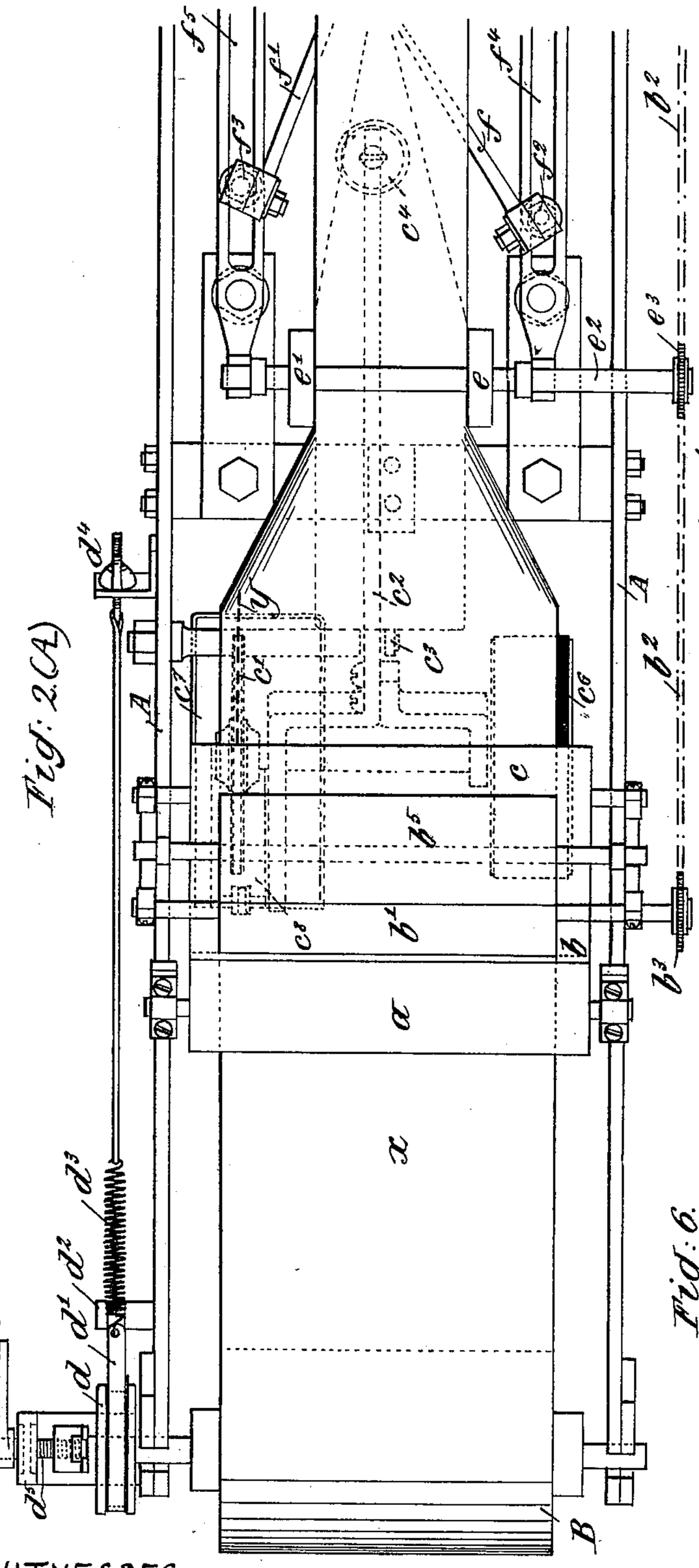


Fig. 2(A)

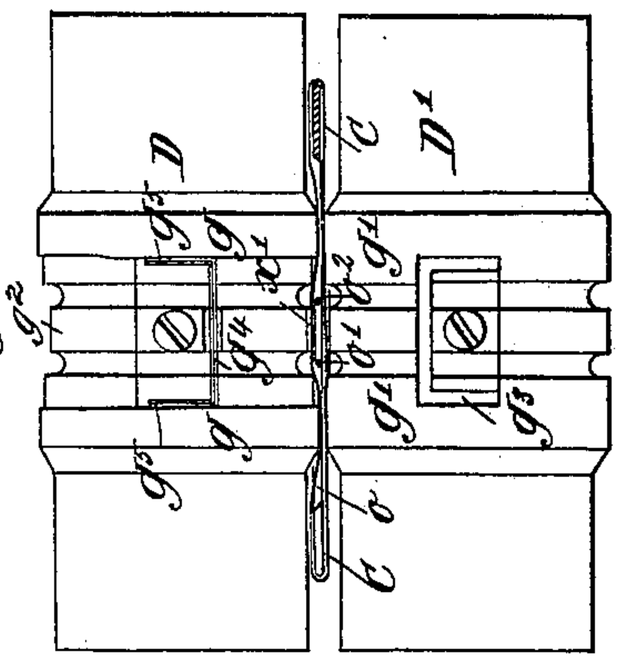


Fig. 5.

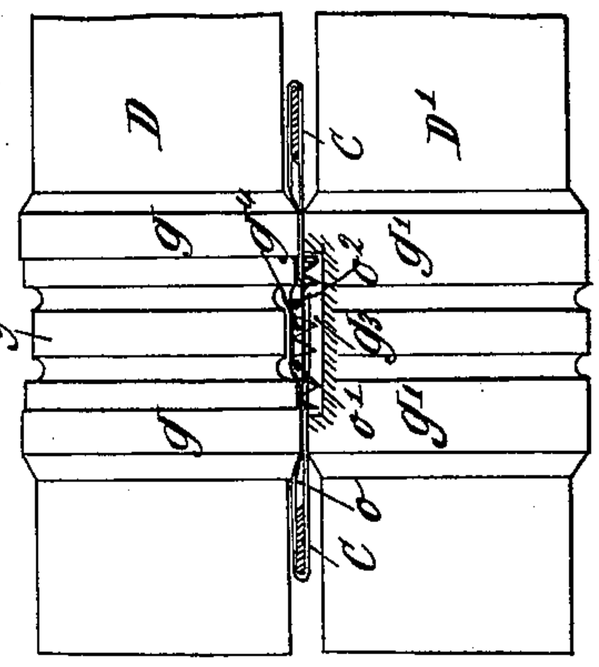
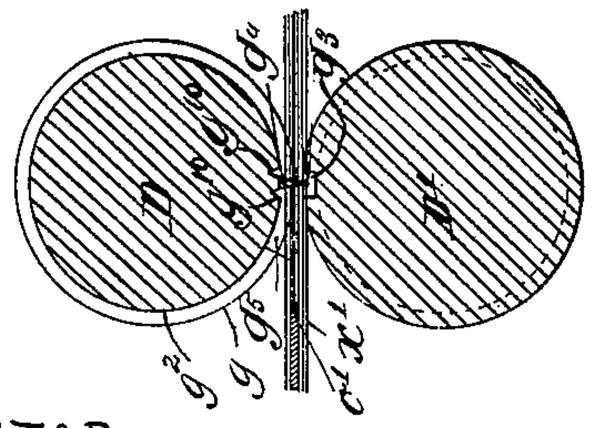


Fig. 6.



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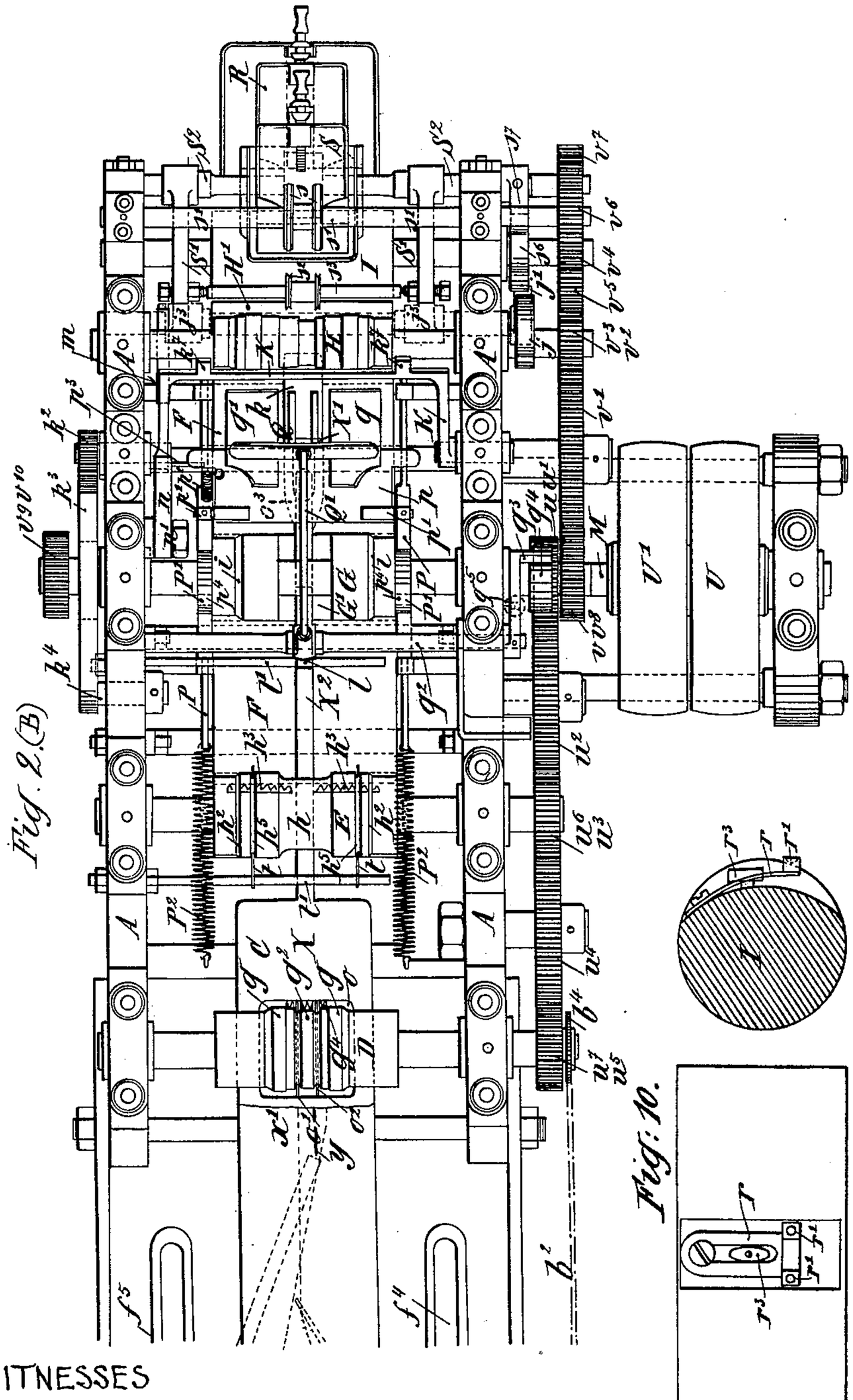

Fig. 2.(B)

Fig: 10.

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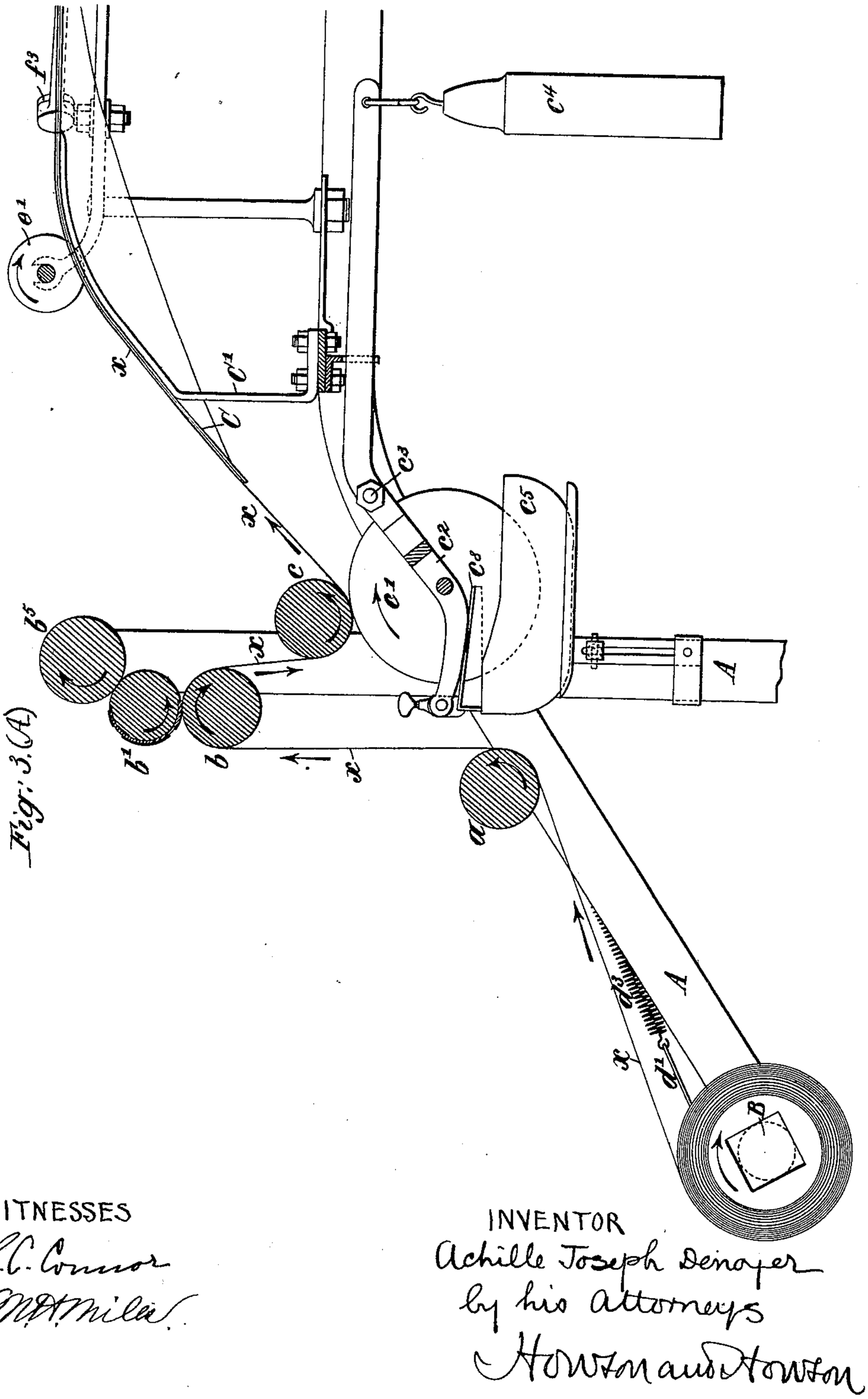

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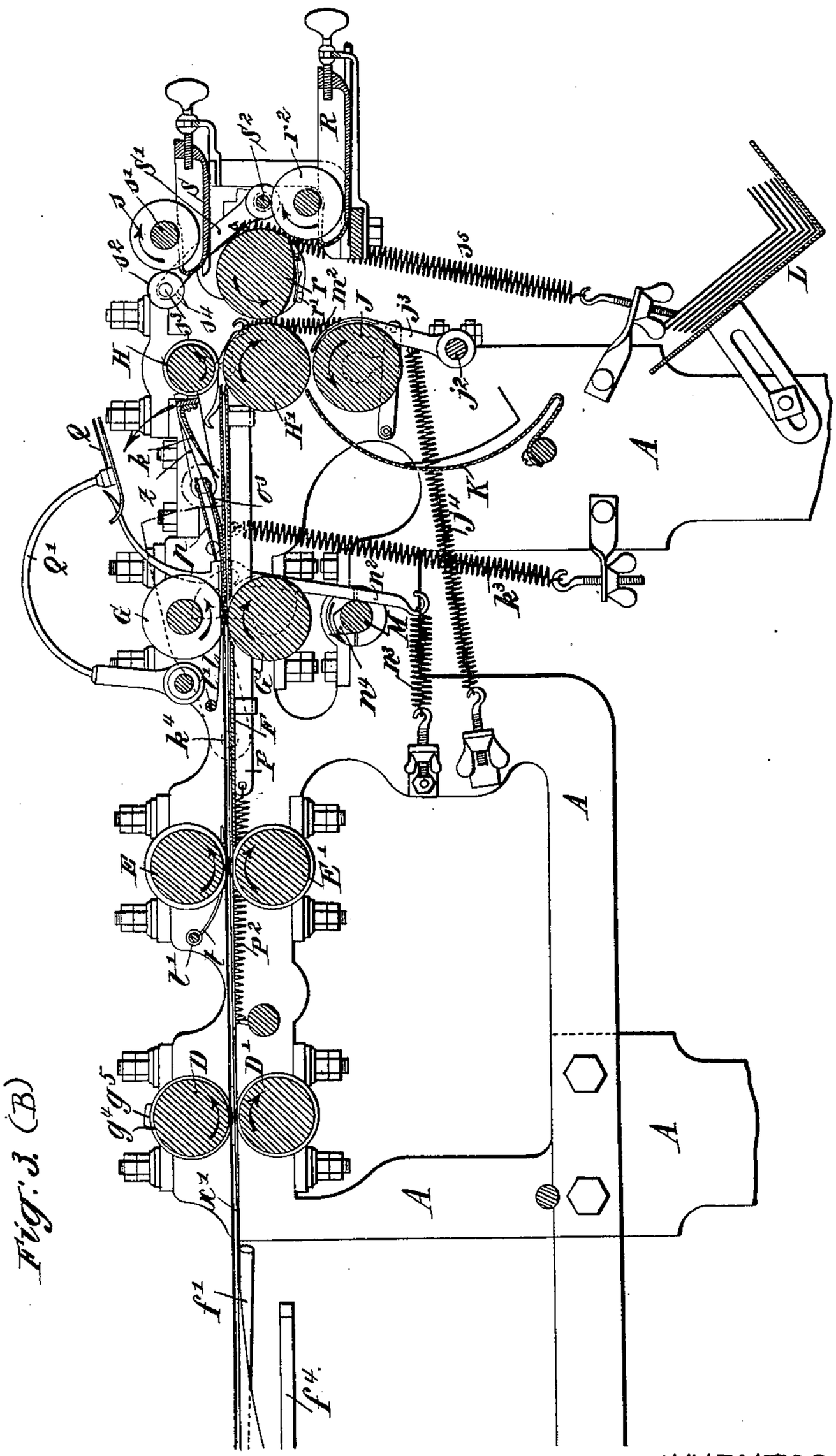

Fig. 3 (B).

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Fig. 4.

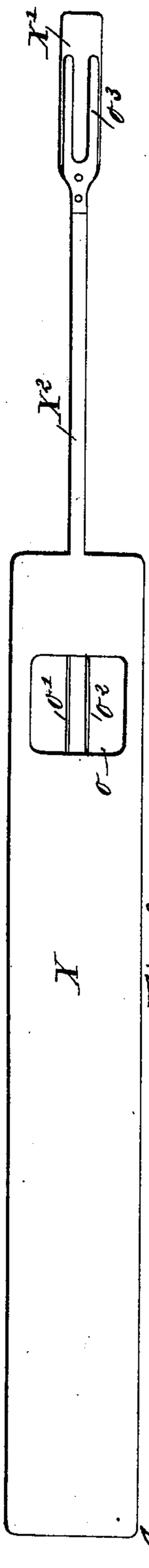

Fig. 5.

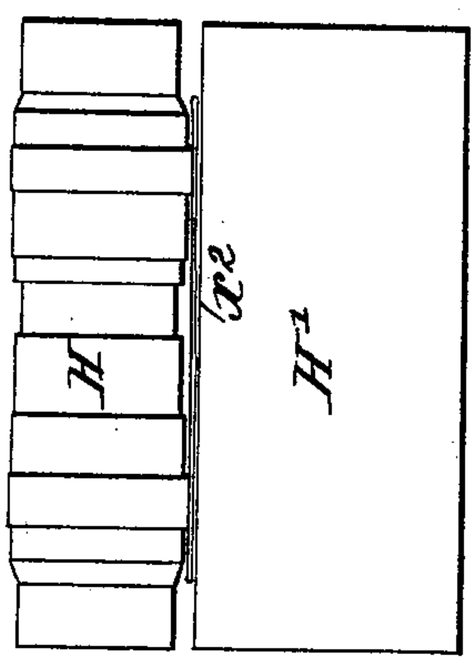

Fig. 9.

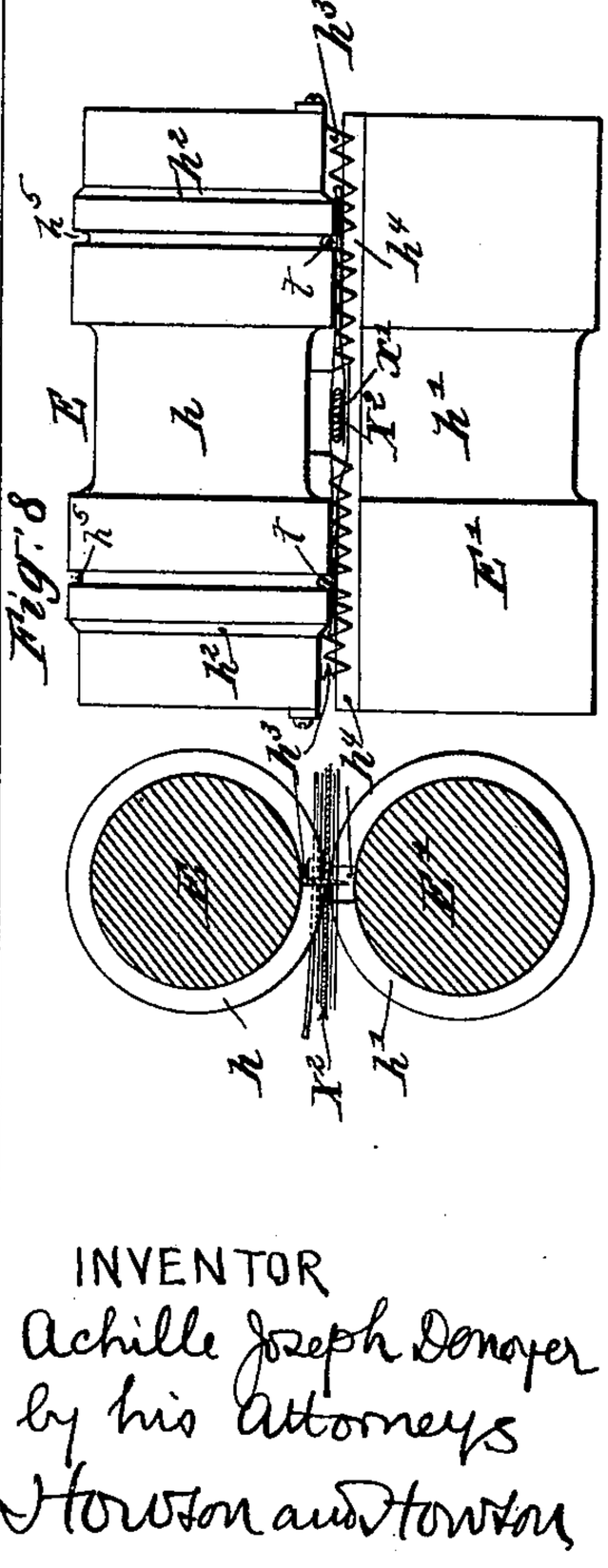

Fig. 8.

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11 Sheets—Sheet 8.

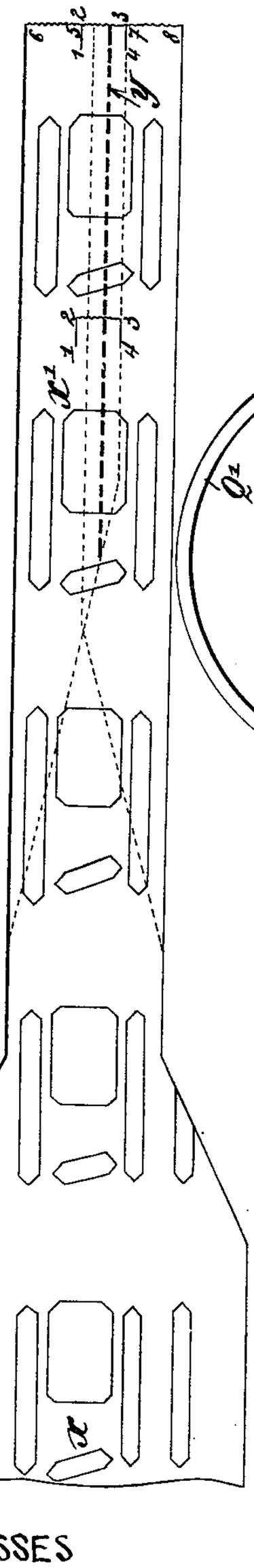

Fig. 18.

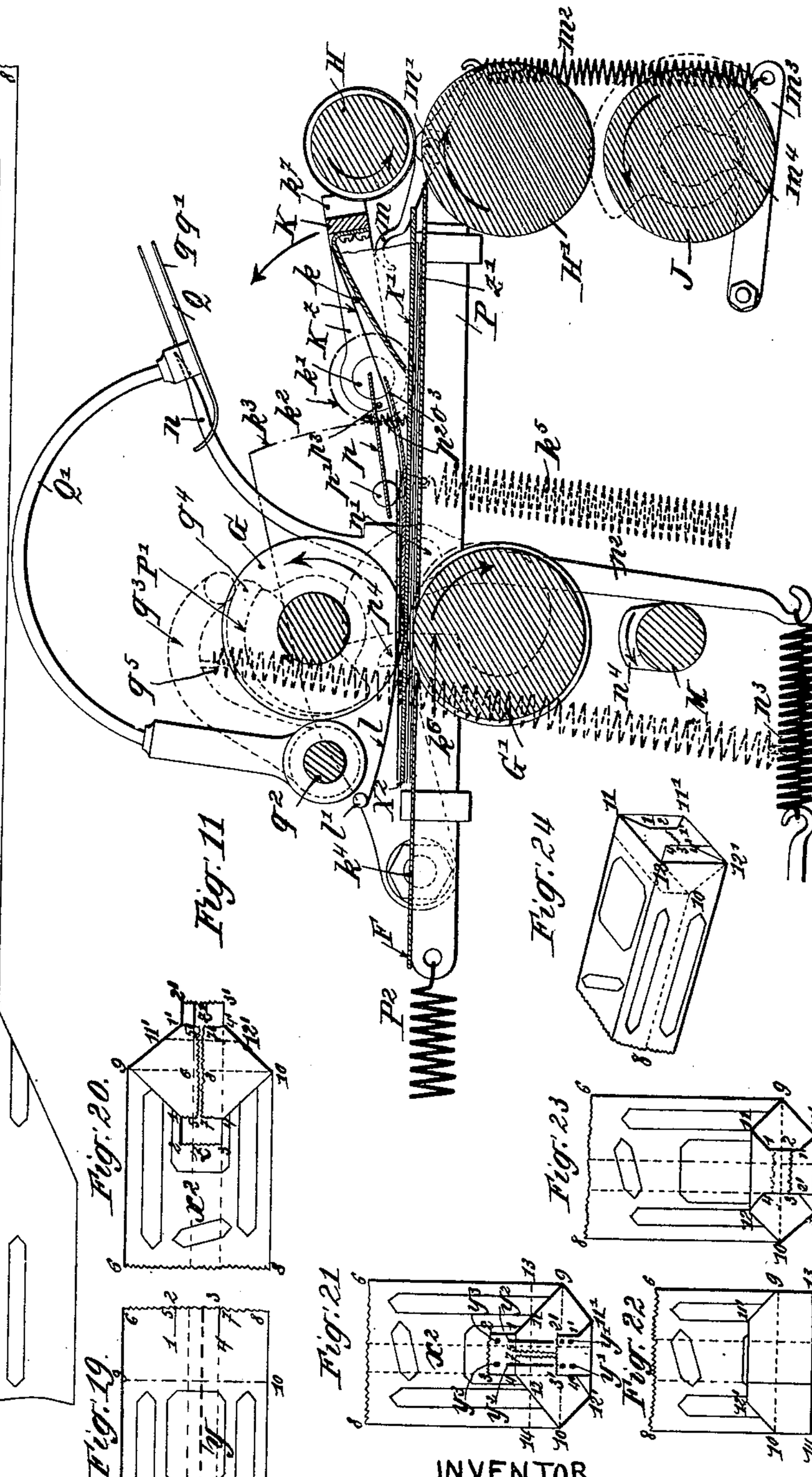

Fig. 11

Fig. 20.

Fig. 19.

Fig. 21

Fig. 22

Fig. 23

Fig. 24

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Fig: 12.

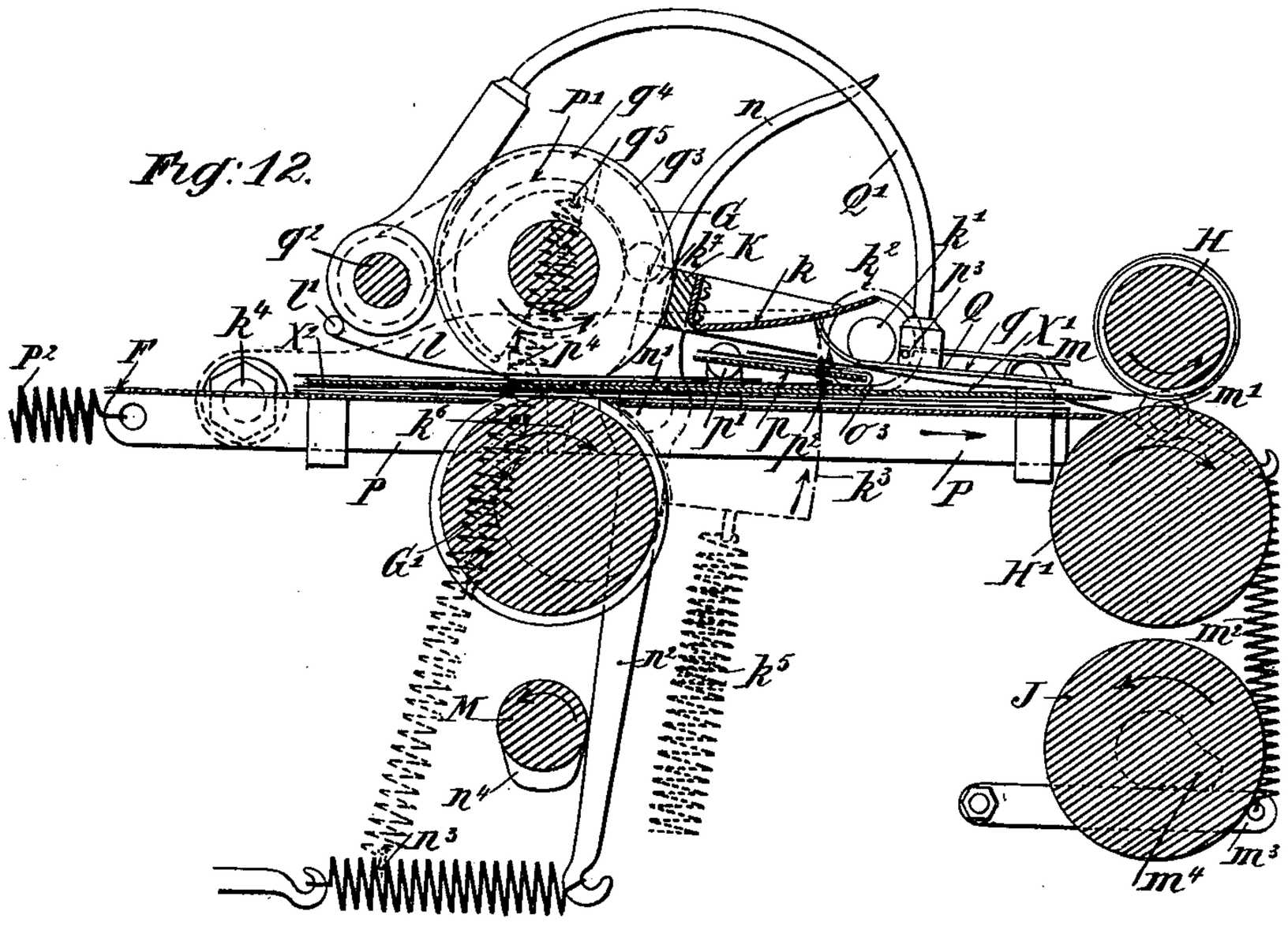

Fig: 15.

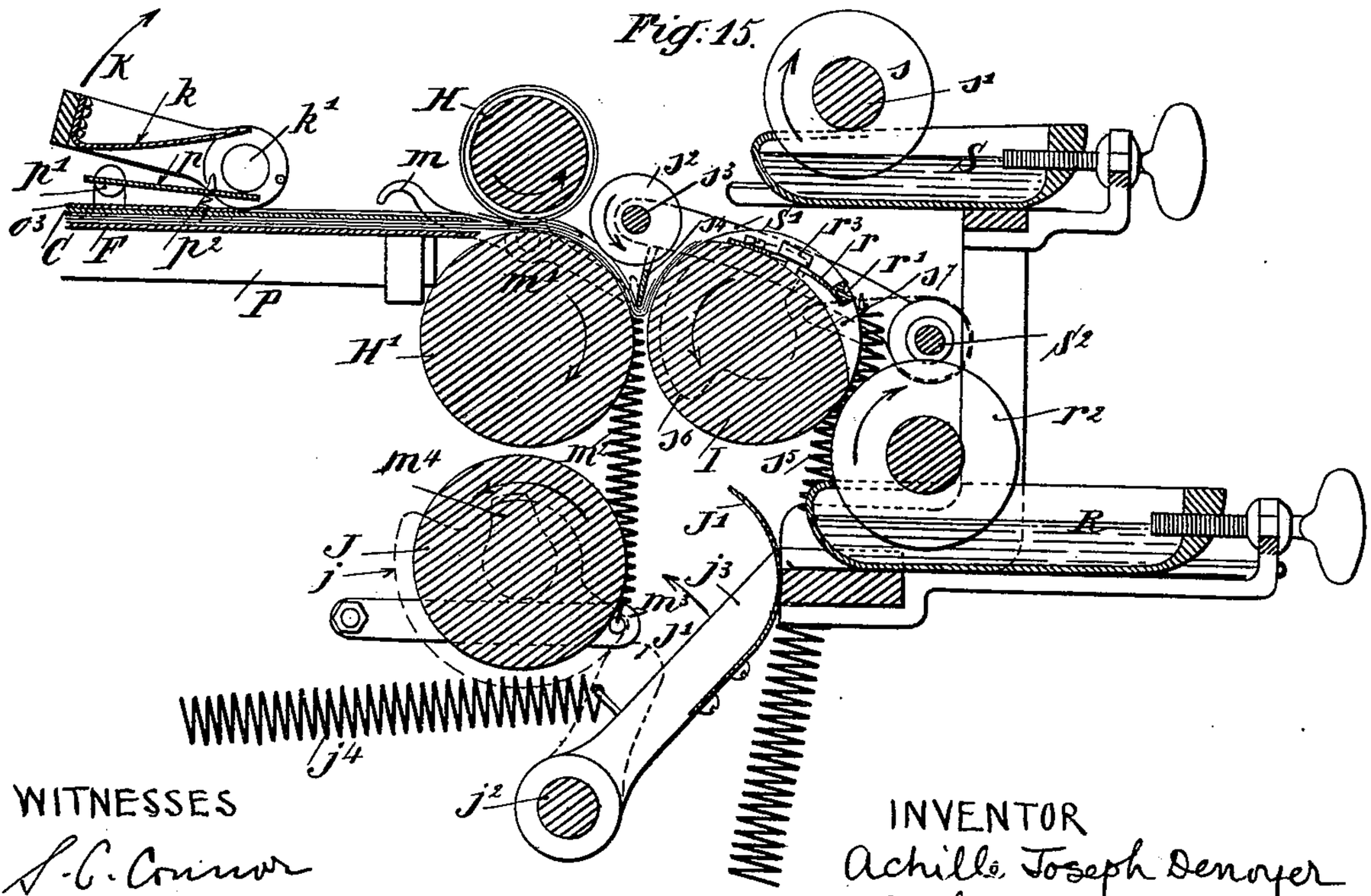

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Fig: 13.

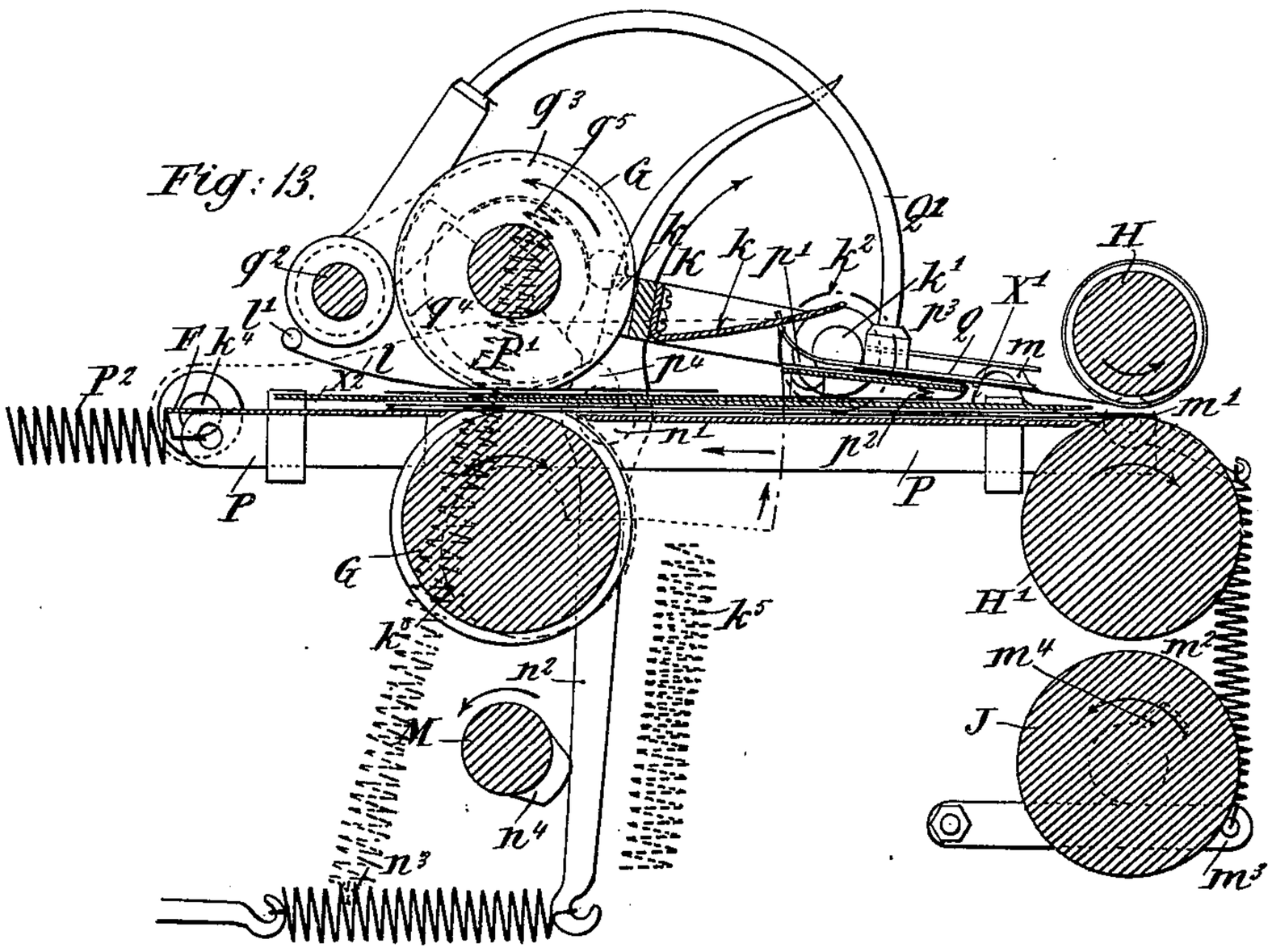

Fig: 16.

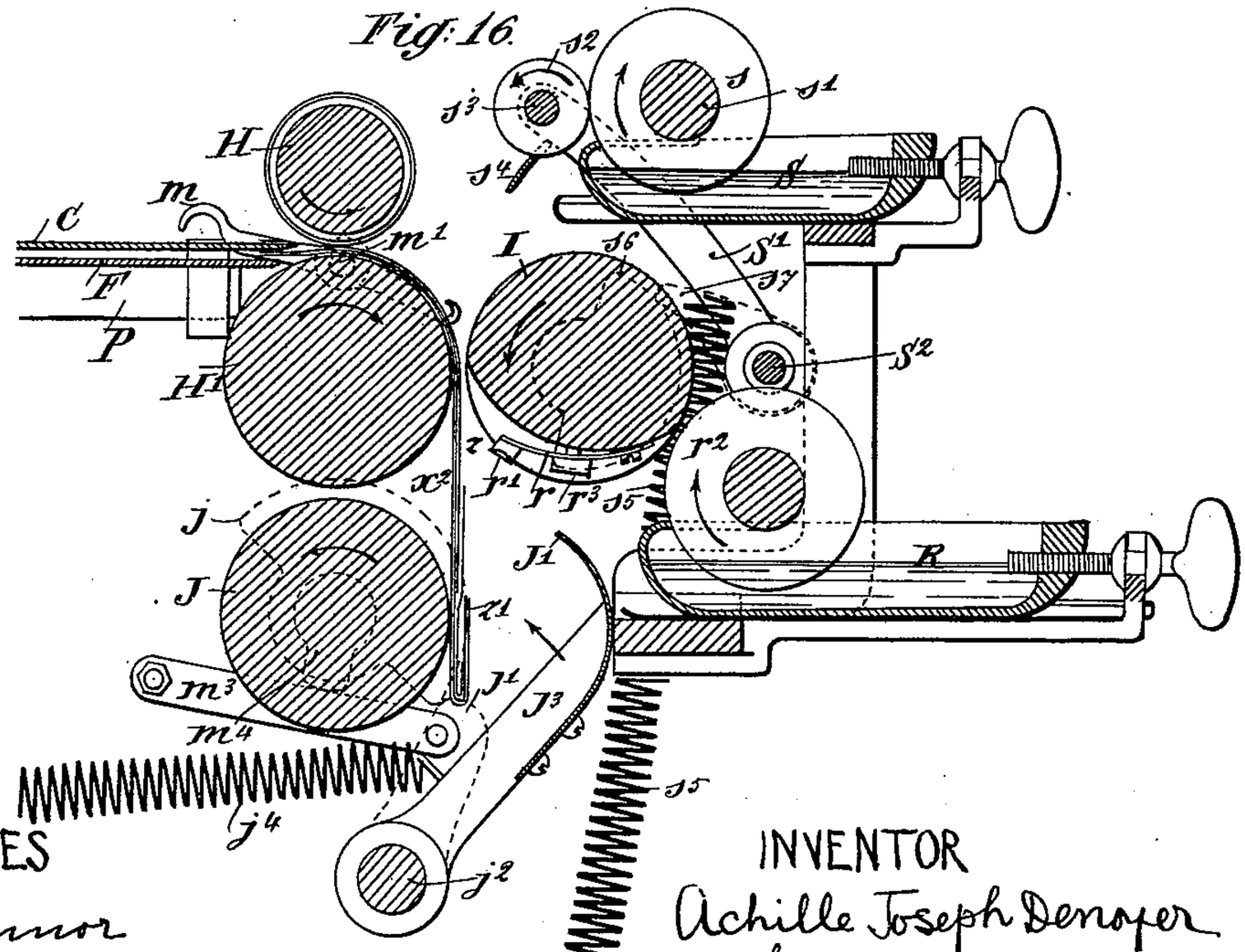

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Fig: 14.

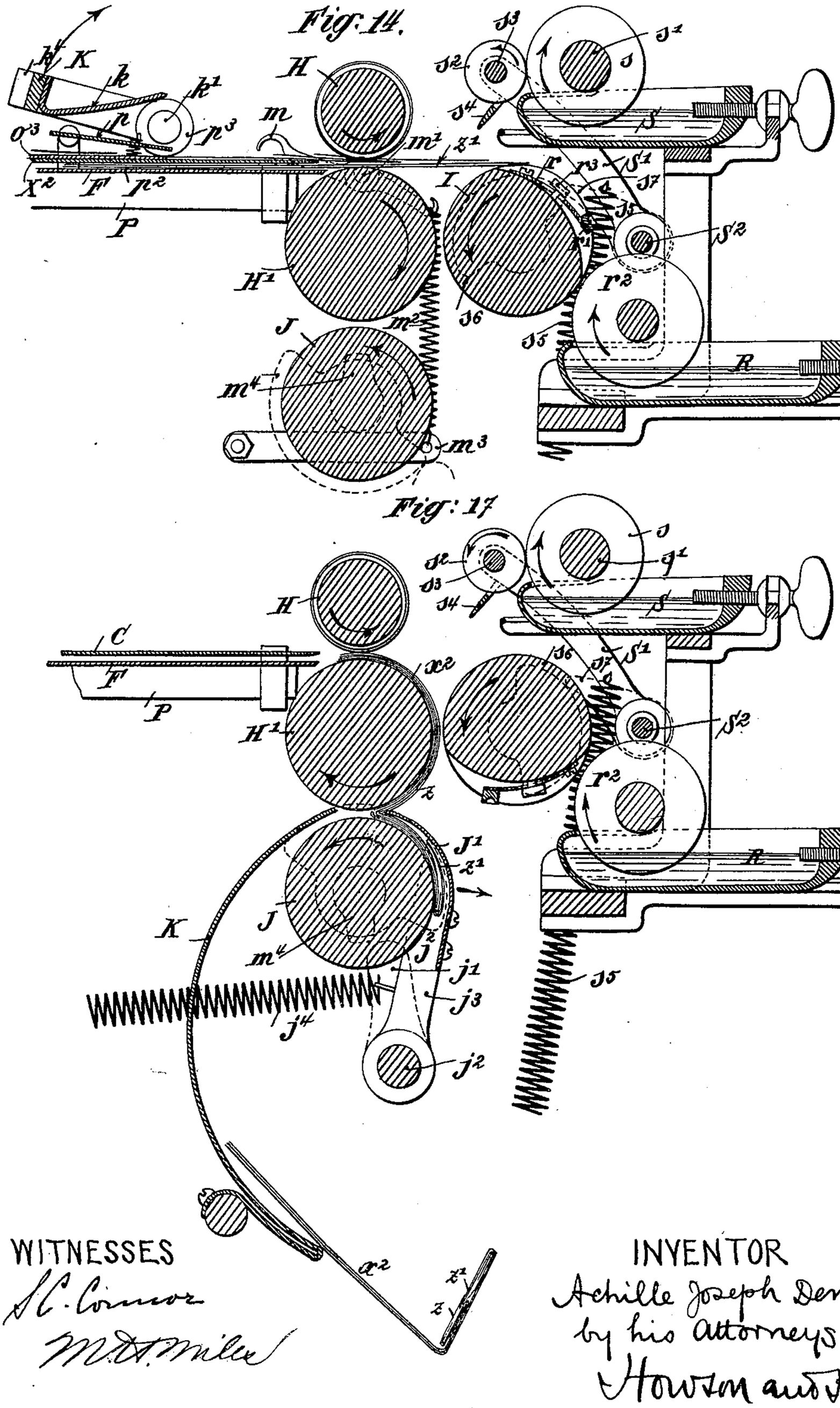

Fig: 17

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UNITED STATES PATENT OFFICE.

ACHILLE JOSEPH DENOYER, OF MORET, FRANCE.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 627,397, dated June 20, 1899.

Application filed October 21, 1898. Serial No. 694,226. (No model.)

To all whom it may concern:

Be it known that I, ACHILLE JOSEPH DENOYER, a citizen of the Republic of France, residing at Moret-sur-Loing, (Seine-et-Marne,) France, have invented Improvements in Machines for the Manufacture of Paper Bags, of which the following is a specification.

This invention relates to improvements in machines for manufacturing paper bags having square bottoms, such improvements referring more especially to the machine described in the specification of my former patent, No. 515,199, dated February 20, 1894, the object of such improvements being to simplify the construction, render the operation more certain, and increase the output of the said machines without prejudicially affecting the formation of the bags or their tightness.

In order that my invention may be clearly and readily understood, I have represented the same in the accompanying drawings, in which—

Figures 1^A and 1^B represent together a side elevation of a machine comprising my improvements and intended for the production of square-bottomed bags, Fig. 1 being the left-hand end of the machine. Figs. 2^A and 2^B represent together a corresponding plan view seen from above. Figs. 3^A and 3^B represent a longitudinal section taken through the center of Figs. 2^A and 2^B. Figs. 4 and 5 are views in elevation and in plan, respectively, of a table or form upon which preparation for the formation of the bags takes place. Figs. 6, 7, 8, 9, and 10 are detail views of some of the operative parts of the machine. Figs. 11, 12, 13, 14, 15, 16, and 17 show the different relative positions of the various parts serving for the formation and sticking of the folds of the bag-bottoms. Figs. 18, 19, 20, 21, 22 and 23 illustrate the successive phases of the manufacture of a bag, and Fig. 24 is a perspective view of a finished bag in an open condition.

The machine represented in Figs. 1, 2, and 3 has a frame A supporting all the operative and fixed parts necessary in the manufacture of the bags, at the rear portion of which frame is situated a reel B, carrying the endless band of paper employed in such manufacture. The paper x from this reel B passes successively over rollers a, b, and c before reaching the table or form C, hereinafter referred to. The roller a merely acts as a guide, while the roller b, arranged opposite to a printing-roller b', serves to support the paper while it is being impressed. The roller c, arranged opposite to a milled pasting-roller, also serves to support the paper during the operation of applying the adhesive substance.

The printing-roller b' has a circumferential development equal to the length of the paper required for the formation of the bag. To its surface is applied a rubber stamp bearing the device or matter desired to be impressed, and it is caused to rotate by means of an endless chain b^2 passing over a chain-wheel b^3, rigidly fixed upon one of the extremities of its axis, and on the other hand by a chain-wheel b^4, rigidly fixed upon one of the extremities of the axis of a cylinder D, hereinafter referred to. This printing-roller b' is inked by means of a cylindrical pad b^5, impregnated with ink capable of drying very readily, in the same manner as ordinary universal pads, its rotation being caused by that of the printing-roller. It should be pointed out that the rubber stamp is mounted upon its roller in such a position that the impression is effected at a predetermined place upon the paper corresponding to a fixed position upon the finished bag. It will, however, be understood that such impression may extend over the whole of the surface of the paper which will be visible outside the formed bags and that in so locating the impressions that they are arranged either lengthwise of the bags, across them, or in diagonals, or in any desired manner.

The pasting-roller c' is mounted at one of the extremities of a lever c^2, pivoted at c^3, and loaded at its opposite extremity with a counterweight c^4, serving to constantly apply the said roller beneath the band of paper x. This roller or disk is partly immersed in a vessel c^5, containing an adhesive substance, and deposits, owing to its free rotation, a narrow strip y of the adhesive substance, Fig. 18, at a small distance from the edge of the paper x opposite to which it is situated. It should be noticed that the extremity of the lever c^2 which carries the milled disk c' is forked and that the branches of this fork support the axis of the said disk, opposite to which is rigidly

fixed a roller c^6 of the same diameter as the disk c' and provided with an india-rubber covering at its periphery, the said roller resting upon the edge of the band of paper x opposite to that which receives the adhesive strip y. This roller c^6 owing to its adherence to the band of paper x necessarily turns when this latter is displaced and causes the disk c' to participate in its movement of rotation. On the other hand, it counterbalances the pressure exerted by the said disk upon the band of paper in such a manner that this band has no tendency to oblique displacement, as might otherwise be the case. It will also be noticed that the vessel c^5, containing the adhesive substance, is mounted upon a plate c^7, the height of which may be so adjusted that the disk is immersed in the adhesive substance to any desired extent, and, further, that one of the arms of the forked lever c^2 is provided with a scraper c^8, which embraces the disk and frees it from any excess of the adhesive substance which it may carry on its sides. Before proceeding further it should be pointed out that the axis of the reel B is provided with a brake which may be formed of a pulley d, surrounded by a band of leather d', attached on the one hand to a fixed point d^2 and on the other hand to a spiral spring d^3, the tension of which may be regulated as desired by means of a nut d^4. This brake serves to check the too rapid unwinding of the reel. In addition to this the axis of the reel B may be displaced laterally in such a manner as to regulate the position of the band of paper x so that it corresponds to the axis of the machine. This displacement may be effected by means of a screw d^5 traversing a nut and provided with a handle d^6. After having been provided with this adhesive strip at y adjacent to one of its edges the band of paper x passes onto the table or form C, beneath which the lateral edges of the said band are folded in such a manner as to produce a kind of flattened pocket x', Fig. 18. This form C, Figs. 4 and 5, consists of a thin metal plate, which at its rear portion, slightly inclined toward the disk c', is of a width X equal to one-half that of the band of paper x less the covering of the lateral edges, and which at its front portion is reduced to a width X′ equal to the width of the flaps hereinafter referred to. For a certain portion of its length the form C is of a greatly-reduced width X^2, in order to permit of the transverse cutting hereinafter described. The form C is fixed at its rear portion to a support C′, while at its front portion it is entirely free. It is provided in front of its wide portion with an aperture o, through which pass two wires o' and o^2, arranged longitudinally. The function of these wires will be hereinafter explained. To its front portion is fixed a flat forked spring o^3, the branches of which constantly tend to separate the said table or form. Upon each side of this table C are arranged rollers e e', serving to turn down the edges of the band of paper x projecting beyond the edges of the said table. These rollers e e' are mounted upon a transverse axis e^2, arranged above the table, and to which motion is imparted by the endless chain b^2, already mentioned, which is in engagement with a chain-wheel e^3, fixed to one of the extremities of the said axis. Following these rollers are provided fixed rods f and f', arranged beneath the table C and which serve to raise beneath this latter the edges of the band x which are turned down by the rollers e e' in such a manner that the band x completely envelops the table and constitutes a flattened sheath or pocket x', as indicated in Fig. 18. It will be noticed that on the one hand the width X of the table C is such that the edges of the band of paper cover each other by a certain amount and that on the other hand the rods f and f' act successively in such a manner that the said edges are superposed beneath the table in such order that the edge provided below with adhesive substance along the line y comes over the edge not so provided and adheres thereto. It will further be noticed that the rods f f' are pivotally secured at one end upon guides f^2 f^3, so that they may be radially turned, thereby vertically adjusting their opposite ends. The rods are also capable of being fixed at a suitable position in the slides f^4 f^5, which also form the supports of the axis e^2. It will be seen that these rods f and f' may be adjusted in any direction, (vertically, longitudinally, and transversely,) thereby enabling perfectly-accurate folding and raising of the edges of the band of paper beneath the table or form C to be effected and the production of a flattened pocket x'.

Opposite to the aperture o of the table or form C are two cylinders D and D′, arranged transversely, one above and the other below the said aperture, and being of a circumferential development equal to the length of the bags to be formed. The axes of these two cylinders are mounted, respectively, in bearings and are caused to rotate in the direction of the arrows, Figs. 1^B and 3^B, in the manner which is hereinafter explained. They are each provided with annular reliefs g g and g' g', Figs. 6 and 7, which, owing to their contact through the aperture o, press between them to the pocket or sheath of paper x', so as to displace it longitudinally upon the form C. Within these reliefs are formed annular grooves arranged opposite the wires o' o^2, and between these grooves there exists a central relief g^2, which projects to a less extent than the reliefs g g'. The object of these grooves and of this relief is that no obstacle may be opposed to the displacement of the sheath at the place where the superposed and adhering edges are situated and at the same time to avoid crushing the strip of adhesive substance y which is between these latter. Finally, the cylinder D′ is provided with a U-shaped cav-

ity g^3 and the cylinder D with a cutting-blade g^4 of corresponding form, the return portions g^5 of which are plain cutters, while the middle portion g^4 is serrated. The cylinders D and D′ are fixed in such a manner that the blade g^4 of one engages in the cavity g^3 of the other in such a manner as to form shears and to produce in the sheath or pocket x' at each of their revolutions U-shaped cuts 1 2 3 4, forming in the said sheath superposed flaps z and z'. It should be noticed that upon each side of the middle portion of the blade g^4 is provided a cavity g^{10}, in which the cut edges of the paper lodge, so that the flap z' possessing a portion of the adhesive strip y does not touch the cylinder D, which is thus protected from accidental contact with the adhesive substance. It should further be noticed that the wires o' and o^2 serve to separate while the sheath of paper x' is advancing the lower portion of the said sheath from the upper and to destroy any adherence which might exist between the superposed flaps z and z' in line with the cut 2 3 produced by the serrated blade. The sheath of paper x' is then presented in this condition in front of two other cylinders E and E′, arranged transversely one above the other near the reduced portion X^2 of the table or form C. These two cylinders, of the same circumferential development as the cylinders D and D′, have their respective axes mounted in bearings and are caused to rotate in the direction of the arrows, Fig. 3B, in the manner hereinafter indicated. They are provided with grooves h h', respectively, Fig. 8, intended to avoid the reduced portion X^2 of the table or form and to permit of contact between the external portions of the said cylinders. The upper cylinder E is chamfered near its extremities at h^2 h^2 in order not to crush the lateral folds of the sheath of paper x', so that these latter have no tendency to cut ultimately—that is to say, when the manufactured bags are opened. It is provided with two serrated blades h^3 h^3, arranged upon the same generating line and intended to form in the paper sheath x' cuts 5 6 and 7 8, Fig. 18, which form continuations of the portion 2 3 of the preceding cut 1 2 3 4 in such a manner as to form a transverse cut 6 8. It should be noticed that the serrated blades h^3 h^3 cut in combination with a corresponding cavity or notch h^4 formed in the lower cylinder E′ and that the cylinder E is provided with two annular grooves h^5 h^5, into which pass tangentially beneath the said cylinder two metal rods t t, which are mounted by one of their extremities upon a fixed cross-piece t', the purpose of which is to detach from the shears or serrated blades h^3 h^3 the paper sheath cut by these latter.

Beyond the cylinders E E′ the sheath of paper x' is not only supported by the reduced portion X^2 of the form C which traverses it longitudinally, but also rests upon a fixed tablet F. It then reaches a third pair of cylinders G G′, arranged transversely one above and the other near the said reduced portion X^2, the upper cylinder preferably being formed of two rollers mounted upon the same axis and having their external edges chamfered at i i in order not to crush the lateral folds of the sheath of paper, with the object already stated. The axes of these cylinders are mounted in bearings and are caused to rotate in the direction of the arrows, Fig. 3B, in the manner hereinafter indicated. They are slightly larger in diameter than the above-named cylinders D D′ and E E′, so as to impart to the portion of the sheath which passes between them a greater velocity, in order that this portion may be detached from the remainder of the sheath, the said portion being separated upon the cutting-line 6 8 and being the portion x^2, Fig. 19, intended for the formation of a bag. This increase of velocity, which continues until the termination of operations, serves to produce between the sheath x' and the detached portion x^2 and all the detached portions x^2 which follow each other in the machine the separation necessary for the different phases of the formation and of the sticking of the folds of the bottom of each of the bags in course of manufacture. The detached portions will hereinafter be designated as "sheath" x^2. The sheath x^2 thus detached and separated from the sheath x' reaches the end of the table or form C—that is to say, the part X′. The forked spring o^3, which is arranged at this point, raises the upper flap z, Fig. 3, of this sheath x^2 and guides it toward an inclined plane k, arranged above the form C. This inclined plane k is fixed upon a frame K, mounted upon pivots k' k', one of which carries a toothed pinion k^2, gearing with a toothed sector k^3, pivoted at k^4 and constantly maintained depressed by means of a counter-spring k^5. A cam k^6 of suitable configuration, which is rigidly fixed upon the axis of the cylinder G′, acts upon the said sector in such a manner as to raise it progressively until the moment at which it releases it, in order that it may be depressed by the action of the said spring k^5. It will be noticed that an idle period caused by the form of the said cam itself exists both before and after the lifting of the sector k^3. Under the influence of this latter and of the pinion k^2, arranged upon the frame K of the inclined plane k, this latter describes an arc of a circle around the point k', so as to become depressed from the front to the rear, and vice versa, as will be seen hereinafter.

Beneath the frame K of the inclined plane k is arranged a lever m, intended to react upon the said frame at the commencement of its depression from front to rear, and consequently to facilitate its actuation. This lever is pivoted at m', and its opposite arm is attached to the extremity of a spring m^2, connected with a lever m^3, which is in contact with a cam m^4, keyed upon one of the extremi-

ties of the axis of a cylinder J, hereinafter referred to. This cam owing to its form extends the spring m^2 just at the moment at which the lever m should react upon the frame K, while the spring m^2 has ordinarily no effect upon the lever m.

Above one of the arms of the frame K is provided a circular part n, which is eccentric with respect to the point of oscillation k' of the frame K and which is intended to progressively reduce the fall of the said frame in its depression from front to rear. This compensating part n is merely a lever pivoted at n', of which the opposite arm n^2 is attached to a spring n^3, imparting to the said compensating part the elasticity necessary to its action. In contact with the arm n^2 of this compensating part n is a cam n^4, arranged upon the driving-shaft M of the machine and which owing to its configuration acts upon the said arm so as to raise the compensating part n in such a manner that it offers no resistance to the frame K when the inclined plane k is depressed from the rear to the front—that is to say, when this inclined plane returns to its original position.

Until the moment at which it is lifted by the forked spring o^3 of the form C the upper flap z is maintained by a flexible blade l, mounted upon a fixed transverse rule l', the width of which is equal to that of the reduced portion X^2 of the form C. This flexible blade l offers resistance to any accidental raising of the said flap until this latter is opposite the forked spring o^3. Above this flexible blade l and the forked spring o^3 of the form C is arranged a pallet p, mounted in such a manner as to oscillate upon pins p' and which is submitted to the action of a spring p^2 constantly tending to cause it to oscillate in a downward direction, but which has no effect so long as this pallet is maintained by a pin p^3 upon one of the arms of the said frame K. On the other hand, the pins p' of the pallet p are supported in longitudinal slides P P, which are suitably guided and submitted to the action of corresponding cams P' P' upon the axis of the cylinder G and which when they encounter the projections p^4 of the said slides impel these latter and likewise the pallet p toward the front of the machine. The backward return of these parts is effected suddenly by means of a spring P^2, attached to the slides P. It should be remarked that the cams P' P' act also upon the noses k^7 k^7 of the frame of the inclined plane k in such a manner as to assist the operating mechanism of this latter when it is depressed from rear to front. They act at the commencement of such depression.

The pallet p when at rest in its rear position, Fig. 3^B, is so adjusted that its fore edge is opposite to a line 9 10, Fig. 19, of the sheath x^2. Above this pallet p is arranged a presser Q, formed of two small plates q q', Fig. 2^B, which are separated by an interval such that they escape or fit upon the inclined plane k and are mounted upon the cross-piece of a lever Q' of a transverse axis q^2, one of the extremities of which is provided with an arm q^3 in contact with a cam q^4, keyed upon the axis of the cylinder G. (See Fig. 13.) A spring q^5 constantly tends to depress the said presser Q, the purpose of which is hereinafter explained.

The different parts which have just been described—namely, the inclined plane k, the pallet p, and the presser Q—serve exclusively for the formation of a portion of the folds of the bottom of the bags—that is to say, the transition of the sheath x^2 from the form indicated in Fig. 19 to that indicated in Fig. 20. In order that this formation may be readily understood and likewise the action of the parts which coöperate to produce it, reference should be had to Figs. 11, 12, and 13 of the drawings.

Fig. 11 shows the upper flap z of the pocket x^2 raised and engaged upon the inclined plane k at the moment at which this latter is about to be depressed from front to rear. It also shows the pallet p raised with its edge opposite the line 9 10 and the presser Q in its raised position.

Fig. 12 shows the inclined plane k depressed toward the rear, the pallet p released from the pin p^3, which is displaced by reason of the depression of the inclined plane k, the front edge of this pallet being lowered in the direction of the table or form C in contact with the line 9 10, and the presser Q being likewise lowered in the direction of the said table or form C. Under these conditions the inclined plane k has turned down the upper part of the sheath x^2 toward the rear, folding the said upper portion upon the line 9 10, upon which rests the front edge of the pallet p, while the lower portion of the sheath x^2 is retained by the reduced portion X' of the table or form C. The depression of the pallet p toward the rear produces not only a fold along the line 9 10, but also and in a perfectly natural manner the folds 1 9 and 4 10, as well as those starting from the points 9 and 10 and terminating at the points 1' and 4' of the lower fold z'. This folding is such that the doubled cuts 5 6 5' and 7 8 7' open and rejoin each other at the middle, Fig. 20. This turning down is produced in a very rapid and practically instantaneous manner, as it will be noticed that the sheath x^2 is constantly drawn toward the front of the machine by the feeding and detaching cylinders G and G'.

Fig. 13 shows the sheath x^2 occupying a more advanced position in the machine. It shows that the pallet p accompanies this sheath until the lower fold z' is seized by the feed-cylinders H and H', which have not hitherto been referred to, while the presser Q secures the folds formed and opposes their deformation or the accidental raising of the portion turned down toward the rear.

The cylinders H and H′, Fig. 9, are arranged transversely and their circumferential velocity is equal to that of the detaching or spacing cylinders G G′, so that the sheath x^2, folded in the manner above described, passes from the one pair to the other without any prejudicial traction or retrogression. The upper cylinder H presents the peculiarity that its extremities are chamfered in order to avoid any crushing of the lateral folds of the pocket, as above stated. When the sheath x^2 is sufficiently engaged between the cylinders H and H′, the inclined plane k, the presser Q, and the pallet p resume their initial position in order to act upon the following sheath x^2.

In advance of the feed-cylinders H H′ is arranged a cylinder I, rotating in the opposite direction, as indicated by the arrows, Fig. 3B, and in a cavity of which is mounted a flexible blade r, to the extremity of which are fixed small cups r', projecting slightly from the said cylinder, which become filled with adhesive substance in their contact with a roller r^2, taking up such adhesive substance from a vessel R. The flexible blade r is combined with a button r^3, which enables it to be maintained at the bottom of the cavity in the cylinder I when, for example, it is desired to cause the machine to run empty. The vessel R is so arranged as to remove from the edges of the roller r^2 any adhesive substance in excess remaining thereon. Above the cylinder I is provided another vessel S, containing adhesive substance, in which are immersed two parallel milled disks s s, mounted upon an axis s', capable of rotation, with which disks two other milled disks s^2 s^2 may make contact, these latter being mounted upon an axis s^3, supported by levers S′ S′, arranged upon an axis S^2. The levers S′ S′ are in addition connected by means of a transverse reglet s^4, placed beneath the disks s^2 s^2. They are submitted to the action of a counter-spring s^5, constantly tending to cause them to oscillate in a downward direction, while a cam s^6 of appropriate form tends, on the contrary, to cause them to oscillate in an upward direction. This cam acts upon an arm s^7, fixed to one of the extremities of the axis S^2 of the levers S′ S′. The normal position of these levers, and consequently of the milled disks s^2 s^2, is that represented in Fig. 14—that is to say, that this position is that in which the said milled disks are in contact with the disks s s. It is in this position that the cylinders H and H′ impel the folded sheath x^2 toward the cylinder I, Fig. 14. When the lower flap z', situated in front, comes into contact with the cylinder I, the cam s^6 escapes from the arm s^7 and the levers S′ S′, under the influence of the spring s^5, oscillate around the axis S^2 and bring the disks s^2 s^2 for applying the adhesive substance and the reglet s^4 into the position indicated in Fig. 15. On referring to this figure it will be seen that the lower edge of the reglet s^4 is applied along a line 11′ 12′, Fig. 20, of the front extremity of the folded sheath x^2 and inflects this extremity between the cylinders H and H′, while, on the other hand, the milled disks s^2 s^2 each deposit a strip of adhesive substance which, owing to the continuous advancement of the paper, extends from y' to y^2. The cylinders H′ and I fold the previously-bent front extremity which is stuck, Fig. 21, upon a portion of the two strips of adhesive substance before mentioned. At this moment the cam s^6 causes the disks s^2 s^2 and the reglet s^4 to resume their initial position, while the cups r' come into contact with the upper flap z, which has been turned down toward the rear, and deposit upon it the drops of adhesive substance y^3, which subsequently cause it to stick. Fig. 16 represents the position of the parts when the said drops y^3 of adhesive substance have been deposited, and the bag presents the aspect shown in Fig. 21. As shown in this figure, the direction of the sheath x^2 has been changed, and its front extremity, folded and stuck, is in advance of the rotating cylinder J, arranged beneath the cylinder H′. To one of the extremities of the axis of this cylinder J is keyed a cam j, acting, by means of its periphery, upon an arm j' of an axis j^2, which carries two arms j^3 j^3, connected by a plate J′, curved with a radius equal to that of the cylinder J, under the influence of a spring j^4, attached to one of the arms j^3, when the cam j releases the arm j', as indicated in Fig. 17. When this is the case, the upper edge of the plate J′ is applied along the line 13 14, Fig. 21, of the front extremity of the pocket x^2 and inflects this latter between the cylinders H′ and J, which seize it and which, under the influence of their rotation in the direction of the arrows, Fig. 17, displace the whole in the direction of a plate K. In this movement the sheath x^2 is folded along the line 11 12, so that the upper flap z and the rear extremity of the said sheath x^2 are applied upon the front extremity of this latter. It results from this folding that the upper flap z is applied upon the lower flap z', which has already been supplied with adhesive substance, and adheres to it, owing to the drops of adhesive substance y^3 there present at the same time that it adheres at y^2 upon the strips of adhesive substance y' y^2. The bottom of the bag is now finished and all its parts are firmly stuck. It should be noticed that on leaving the cylinders H′ and J the fold 11 12 remains formed, owing to the sticking, while the fold 13 14 is ready to open, as shown in Fig. 17. The bag leaving the cylinder in this form encounters the plate K, which guides it toward a receiving-stand L, where all the bags are piled one upon the other, Fig. 3B. When a certain number of bags has been piled up in this manner, they are stood on end by hand in the manner indicated in Fig. 23. Each of the bags so manufactured may be opened for the reception of goods of any kind, their lower end be-

ing square, as shown in the perspective view, Fig. 24.

There remains to be considered the question of the driving of the machine. The starting-point for this is the shaft M, which may be provided at one of its extremities with fast and loose pulleys U and U', but which may also be caused to rotate by hand by means of a handle arranged upon a square formed upon the said shaft for that purpose. Upon this shaft is mounted a toothed pinion u, gearing with another pinion u' upon the axis of the cylinder G', which is thus caused to rotate. This pinion u' transmits the motion to the train of gear-wheels u^2 u^3 u^4 u^5, the pinions u^3 and u^5 of which (which are of the same diameter as the pinion u') belong to the lower cylinders E' and D', respectively, while the gear-wheels u^2 and u^4 are merely intermediate wheels. The object of the said train of gearing is to cause the cylinders in question to rotate in the same direction and with the same speed, while to the cylinder G' is imparted a greater circumferential velocity by reason of its larger diameter. At the side of the pinion u' and keyed upon the same shaft is arranged another pinion v of slightly larger diameter than the pinion u' and transmitting the motion to a train of gear-wheels v' and v^2, of which the pinion v^2 (of the same diameter as the pinion v) belongs to the cylinder H', while the wheel v' is merely an intermediate wheel. The object of the said train of wheels is to cause the cylinder H' to rotate at the same circumferential velocity as the cylinder G'. With the pinion v^2 gear other pinions v^3 v^4 v^5, which drive the cylinders H I J, respectively. With the pinion v^4 gear the pinions v^6 and v^7, respectively, driving the milled disks s s and the roller r^2. The pinions u^3 and u^5 gear with other pinions u^6 and u^7, respectively, which are intended to drive in the desired direction the cylinders E D. The cylinder G is driven by the cylinder G' by means of the two pairs of pinions v v^8 and v^9 v^{10}. Finally, upon the axis of the cylinder D is arranged the chain-wheel b^4, driving the chain b^2, which serves, as above explained, to operate the rollers e e' and the printing-roller b'.

Such in its construction and operation as a whole is the improved machine which I have devised for the manufacture of paper bags having square bottoms.

It will of course be noticed that several bags are in course of manufacture at the same time in various degrees of advancement.

It is true that the bags manufactured by this machine do not present any special feature as regards their manufacture and that all the phases of the operation are identical or almost identical with those of the machine forming the subject of my prior patent; but it should be noticed that the present machine both by its general arrangement and its constructional details totally differs from the original machine and that in addition a more uniform and more speedy manufacture of the bags in question is effected by its use. The object of the whole of the modifications devised have been based upon the transfer of the printing operation from the front to the rear of the machine.

I claim—

1. In a machine for manufacturing paper bags, the combination of a disk for depositing a strip of adhesive substance upon the band of paper, and a roller fixed to the shaft of the said disk and covered with india-rubber, the said roller serving to balance the pressure of the said disk, and by its adhesion to the paper band to be rotated and thereby rotate the said disk, with means for constantly applying the said roller against the band of paper.

2. In a machine for the manufacture of paper bags, the combination of a milled disk for depositing a strip of adhesive substance upon the band of paper, and a roller serving to balance the pressure of the said disk and consequently to avoid all oblique traction of the said band, with a weighted lever carrying the said disk and roller and serving to constantly apply the same against the band.

3. In a machine for the manufacture of paper bags, the combination of a table or form, with turning-down rollers, slides, guides adjustable in said slides, and rods jointed upon the said guides, and thereby adapted to be adjusted in a vertical, longitudinal and transverse direction.

4. In a machine for the manufacture of paper bags, the combination of a table or form around which the paper is wound in a sheath, the said table being formed with an aperture, with rollers adapted to act on the sheath through the aperture, longitudinal wires in the said aperture to maintain portions of the sheath separated, and a spring fixed to the table to open the sheath, substantially as set forth.

5. In a machine for the manufacture of paper bags, the combination of a table around which the paper band is wound in a sheath, with a spring fixed to the table at its front end and adapted to open the end of the sheath, an inclined plane adapted to enter the said open end of the sheath and turn one side back, a pallet and a presser adapted to act with the said inclined plane to form and fold a portion of the bottom of the bag.

6. In a machine for the manufacture of paper bags, the combination of the feed-cylinders H, H', with a rotating cylinder I, milled disks s^2, s^2, supplying adhesive substance, oscillating levers on which the disks are mounted and a reglet rigidly connected to the said levers for the purpose of bending and sticking a flap of the sheath of paper.

7. In a machine for the manufacture of paper bags, a cylinder I, provided with a cavity, and cups r', r', in the said cavity adapted to receive adhesive substance and apply it to a portion of the sheath of paper.

8. In a machine for the manufacture of paper bags, the combination of cylinders H′ and I adapted to bend the lower flap of the paper bag, the said cylinder I being provided with a cavity and cups r', r' in the said cavity, the said cups adapted to receive adhesive substance and apply it to the upper flap of the bag, with a cylinder J and an oscillating plate J′ adapted to fold the upper flap and pass it between the said cylinders H′ and J, substantially as set forth.

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

ACHILLE JOSEPH DENOYER.

Witnesses:

LÉON CRANEKEN,

EDWARD P. MACLEAN.