Jan. 2, 1923.

1,440,682 -

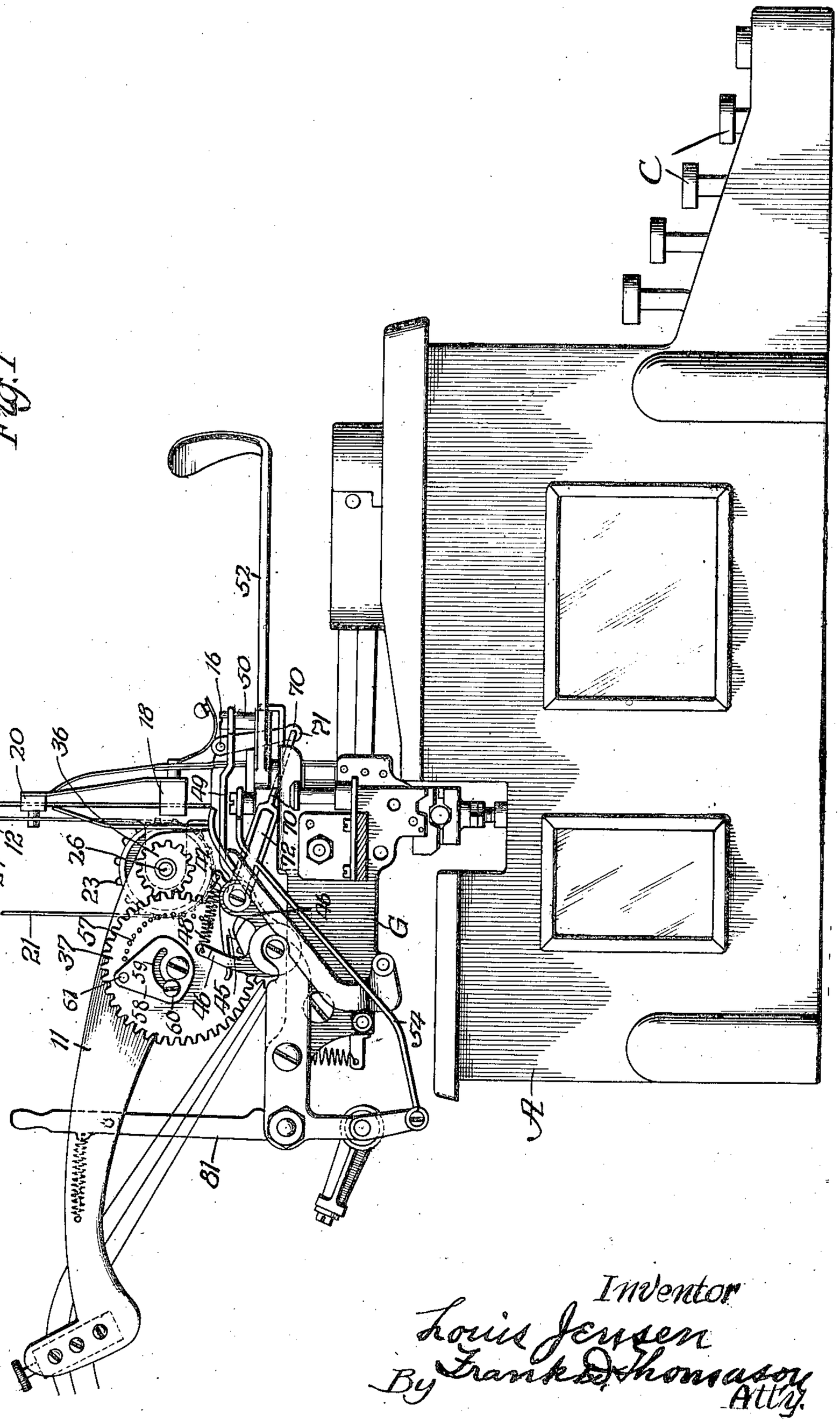
L. JENSEN.

PAPER EXTRACTING MECHANISM FOR TYPEWRITING MACHINES.

FILED MAR. 26, 1921.

5 SHEETS-SHEET 1

Fig. 1



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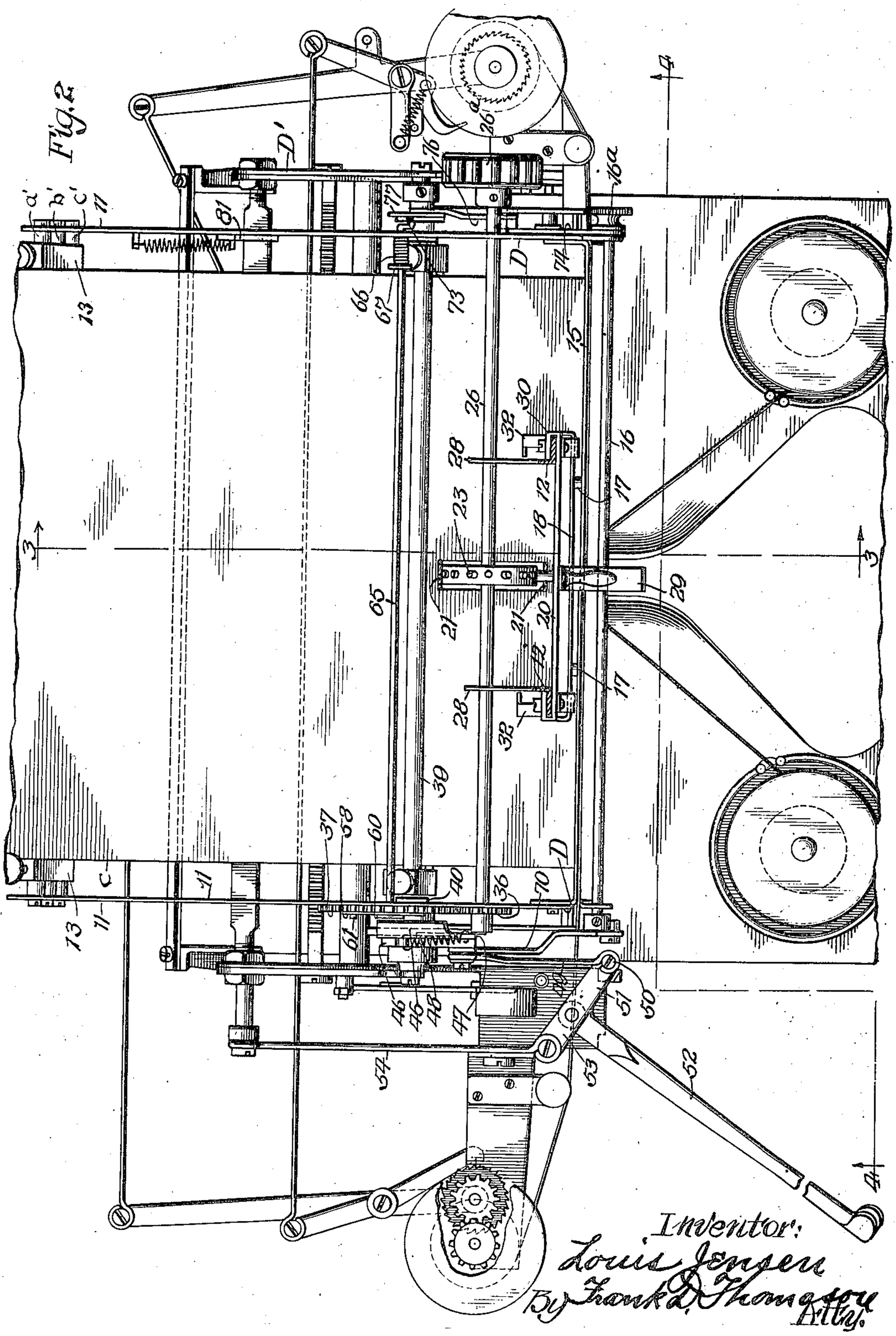
5 SHEETS-SHEET 2

Fig. 2



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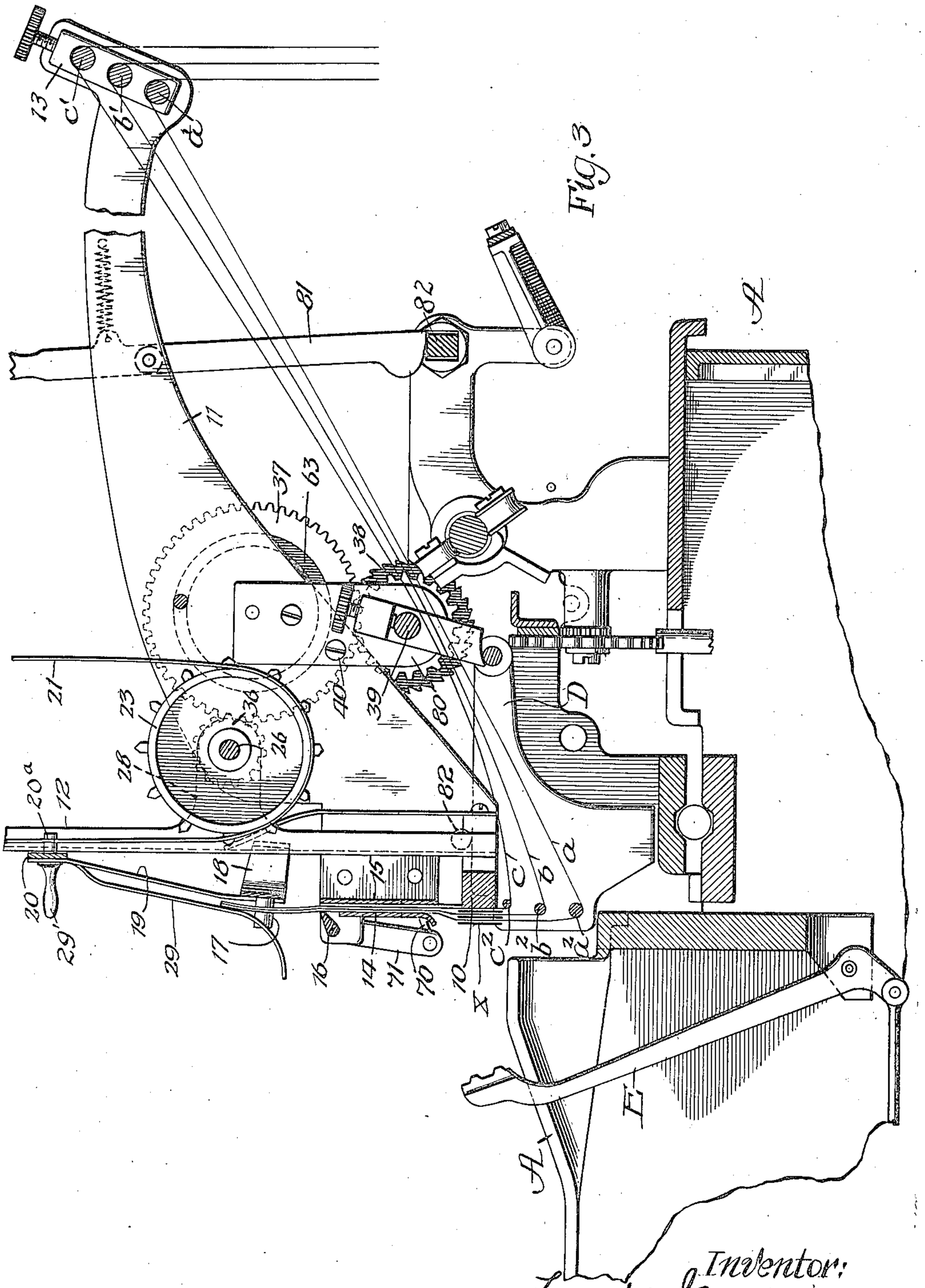
5 SHEETS-SHEET 3

Fig. 3.



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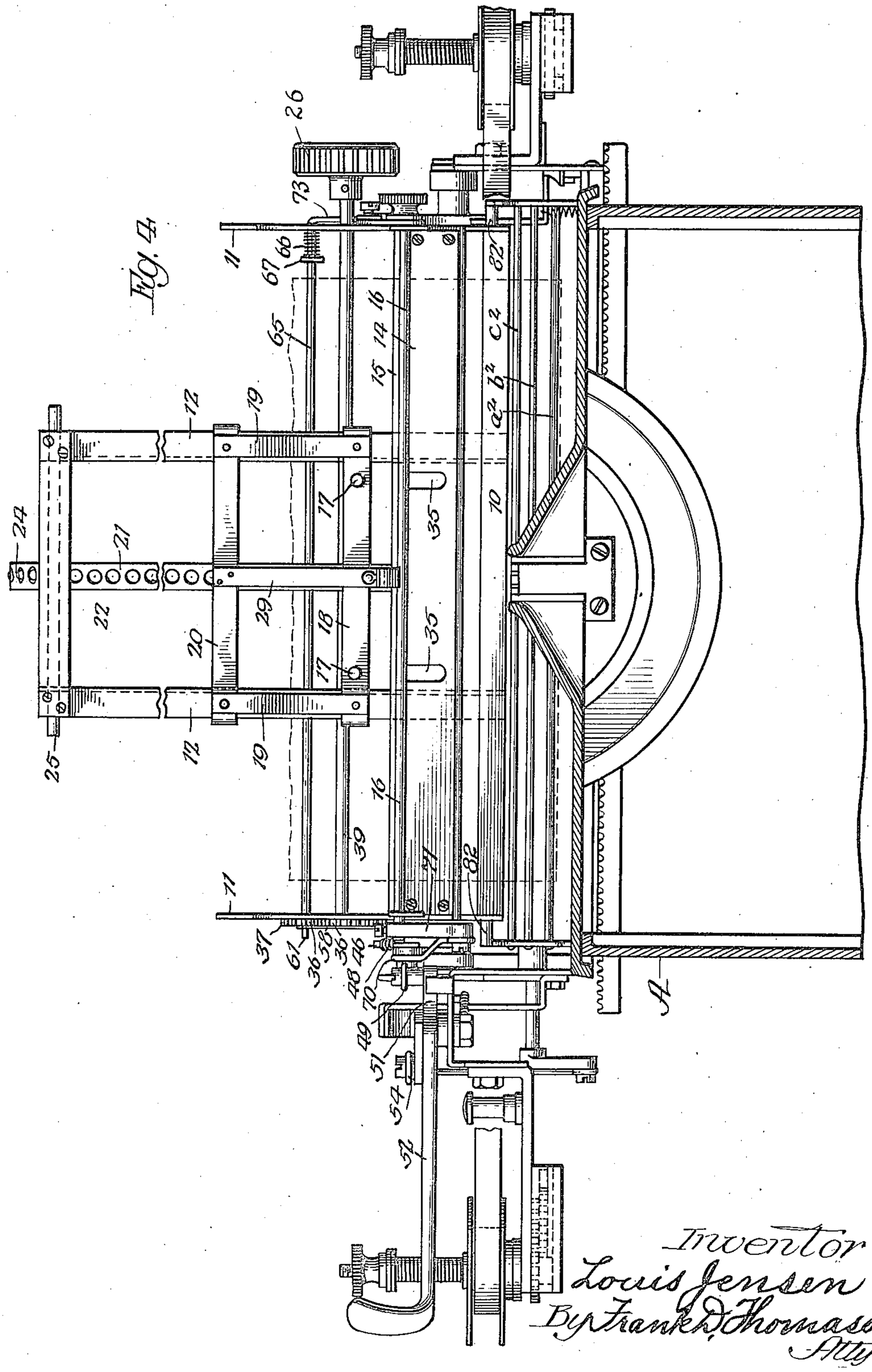
FILED MAR. 26, 1921. 5 SHEETS-SHEET 4

Fig. 4



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FILED MAR. 26, 1921. 5 SHEETS-SHEET 5

Fig. 5

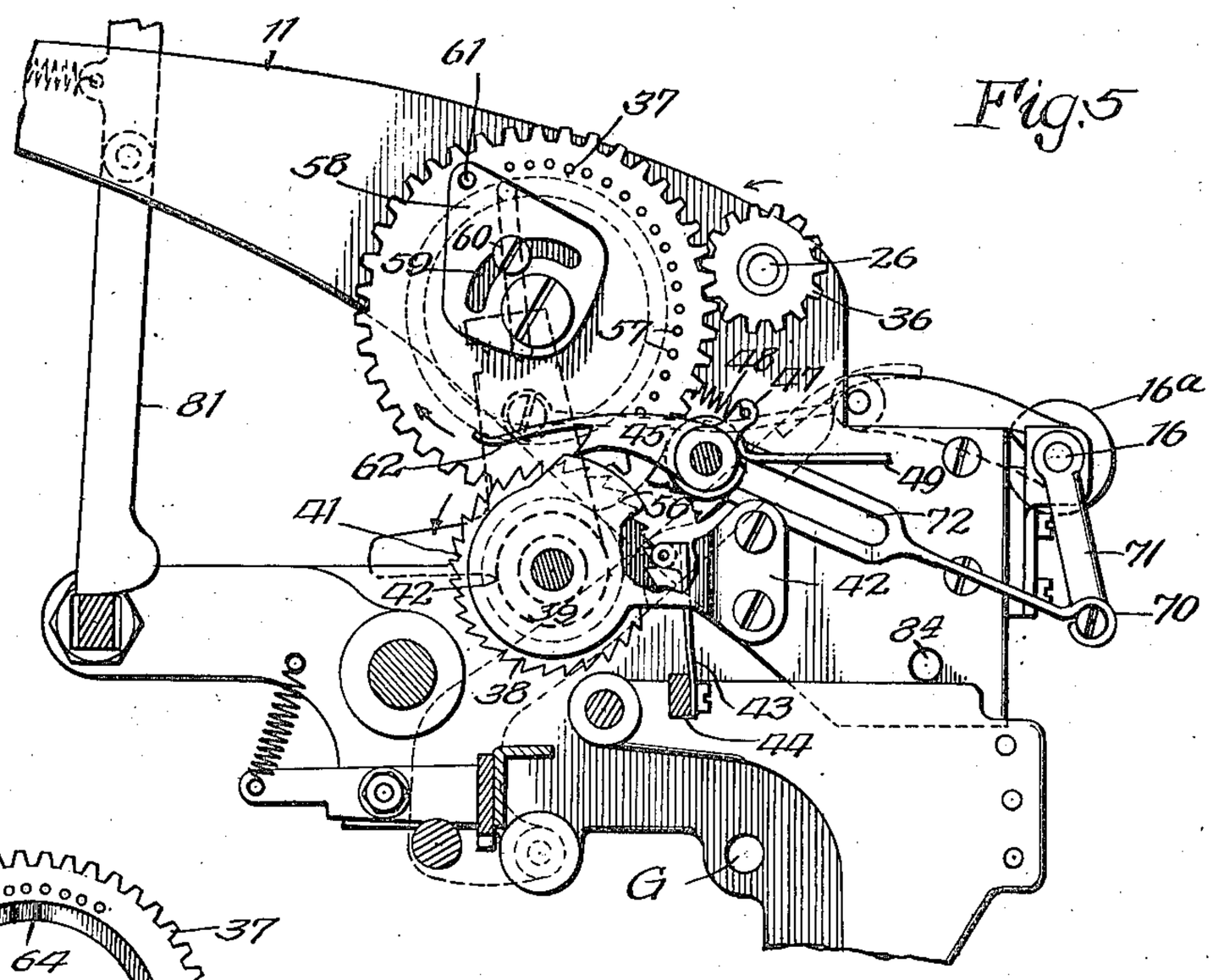


Fig. 8

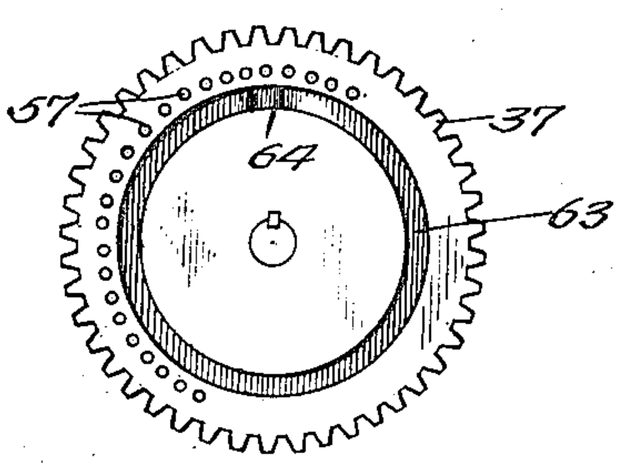


Fig. 6

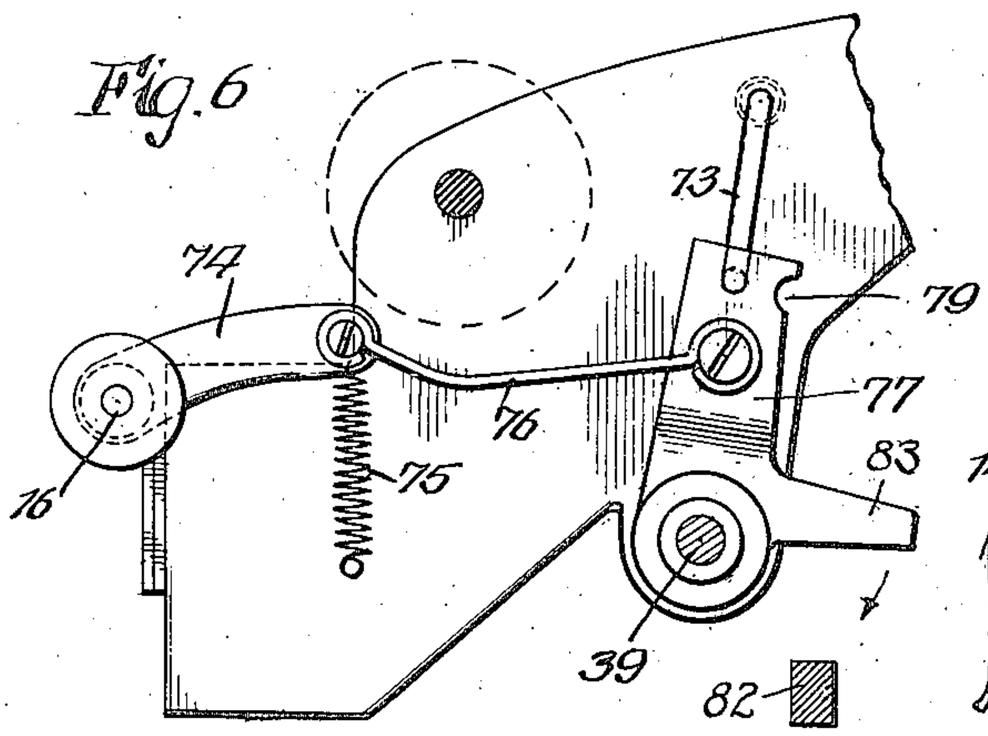
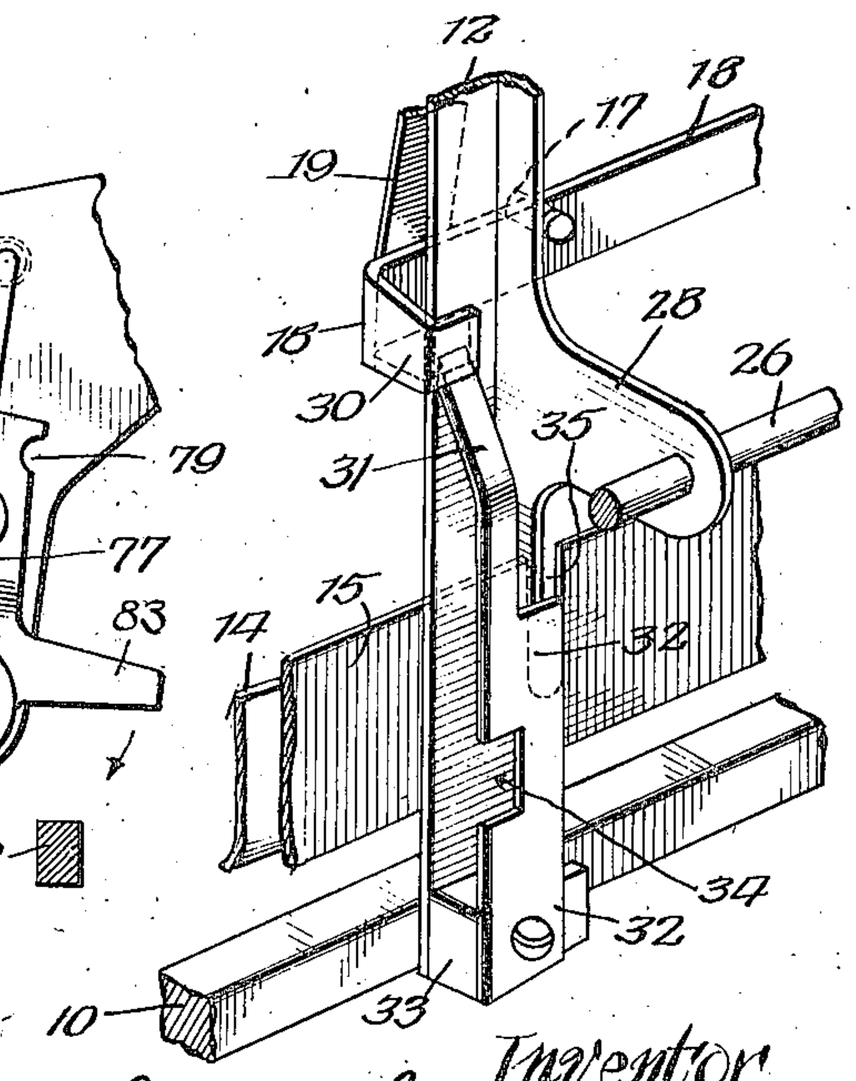


Fig. 7



Inventor
Louis Jensen
By Frank L. Thomason Atty.

Patented Jan. 2, 1923. 1,440,682

UNITED STATES PATENT OFFICE.

LOUIS JENSEN, OF CHICAGO, ILLINOIS.

PAPER-EXTRACTING MECHANISM FOR TYPEWRITING MACHINES.

Application filed March 26, 1921. Serial No. 455,827.

To all whom it may concern:

Be it known that I, LOUIS JENSEN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper-Extracting Mechanism for Typewriting Machines, of which the following is a full, clear, and exact description.

My invention relates to typewriting machines to which the paper is supplied in a continuous web and particularly to mechanism for extracting said paper therefrom.

The object of my invention is to withdraw the paper from the machine in sheets of predetermined lengths and tear the same from the web one set at a time. Each of these lengths have corresponding printed forms on them and when one length is withdrawn my improvements actuate a transverse tearing-blade upon which the said length can be torn from the remainder of the web and leave the lines of the next following form in such relative position that the printed matter will register with the same.

In the various figures of the drawings similar reference letters indicate like parts of my improvements.

In the drawings:

Figure 1 is a side view of a typewriting machine to which my improvements have been applied.

Figure 2 is a plan view of the same with front portion, including the keyboard broken away.

Figure 3 is a longitudinal vertical section taken on dotted line 3, 3, Figure 2.

Figure 4 is a transverse vertical section taken on dotted line 4, 4, Figure 2.

Figure 5 is a longitudinal vertical section taken on dotted lines 5, 5, Figure 4.

Figures 6 and 7 illustrate respectively side views of broken away fragments of my invention.

Figure 8 is a detail view.

Referring to the drawings A represents the supporting-frame of a typewriting machine in which the type-bars E are arranged and actuated by the keys C, in the usual manner. There is nothing in these parts of the machine nor in the elements that support and direct the reciprocation of the carrier that constitute any part of my invention. My improvements relate principally to the mechanism mounted on said carrier, G.

My improvements are mounted on a framework having side-frames D and D′ supported on said carrier, that are so shaped and constructed as to enable my improvements to be properly assembled and to properly function to accomplish the objects sought to be attained substantially as hereinafter more fully described.

These side-frames are parallel to each other and have rearwardly extending cranes 11, 11, secured thereto, and at their lower front angles are connected by a platen 10. This platen consists of a bar that is, preferably, rectangular in cross-section and is provided with a flat vertical front surface against which the typed end of the type-bars E strike when printing on the webs of paper, *a*, *b*, *c*, in front of the same. Each web of paper has corresponding printed forms and divide the web into a series of sections and these sections or lengths register so that when the outer web is printed upon manifold impressions are made in the same relative places on the forms of the webs back of the outer web. To do this manifold ribbons X are interposed between the webs in front of the platen, but as the mechanism for manipulating said ribbons constitute no part of the improvements constituting the subject-matter hereof, no further reference will be made thereto.

Secured at their lower ends to the rear of the central portion of the platen 10, and arising vertically therefrom to a suitable height, are parallel uprights, 12, 12, that are separated a suitable distance and arranged, preferably, centrally between the side-frames D, D, of the supporting structure. The rear ends of said cranes are connected by a rearwardly inclined series of three parallel rollers, *a′*, *b′*, and *c′*, over which the webs of paper, *a*, *b*, and *c*, are fed to the machine, and have guide-blocks 13, 13, adjustably mounted thereon to direct the course of said webs of paper, according as desired. These webs extend forward and in a downwardly inclined direction to the rollers, a^2, b^2, c^2, that are journaled in the side-frames D and D and then travel upwards in front of platen 10. At a suitable point above the latter, said webs pass through a vertical discharge passage between two transversely disposed flat metal plates 14, and 15, that are

spaced apart and are arranged horizontally and parallel to each other, and their ends are secured in any suitable manner to the bases or front portions of cranes 11. The upper edge of the outer plate 14, is in a horizontal plane below that of the rear plate 15 and a horizontal transversely disposed tearing-blade 16 has its ends journaled in lugs, projecting forward from the front edge of the cranes, and can be rocked by hand, by a hand-wheel 16ª on one of its extended ends, or by mechanism, hereinafter described, at the proper time, and normally presses the webs against the rear plate, and holds them while the paper strips are being written on and while the portions thereof above said plate are torn from the portions below it.

Each of the lengths of paper upon which the forms are printed have, near their advanced edge a pair of separated postholes that aline throughout the length of the web. The webs (in this case *b* and *c*) upon which the carbon or manifold copies are to be printed must be made to register with the original web (in this case *a*) so that the lines and indicia of the forms of one web will register with the lines and indicia on the others. This is insured by bringing postholes of the three webs of paper in register.

The three webs are registered and extracted from the machine by means of horizontal pins 17, which project forward from the lower cross-bar 18, of an extracting-frame. This cross-bar 18 is secured to and supported on the lower ends of yielding arms 19, 19, which latter are made of flat spring metal that have their upper ends suitably secured to a cross-bar 20. Cross-bar 18 is of the same length as cross-bar 20, and has its ends bent rearwardly and then towards each other to provide fingers 30 that engage the rear sides of the uprights 12, 12.

Bar 20 at its center of length has a stud 20ª projecting rearwardly therefrom that engages one of a longitudinal series of equidistant perforations in a vertically disposed endless metal belt 21, which latter is mounted upon and has its perforations engaged by the spurs of corresponding upper and lower sprocket-wheels 23, and 24, that are mounted on and revolve with shafts 26 and 25, respectively. Shaft 25 is journaled in lugs 27, 27, projecting rearwardly from the upper ends of uprights 12, and shaft 26 extends through lugs 28 projecting rearwardly from said uprights in a plane slightly above that of the plates 14 and 15, and its ends are journaled in and extend through side-frames D and D′. The right hand end of shaft 26 has a hand-wheel 26ª secured thereto which is used to return the extracting-frame to its lower position to engage the advanced pages of the webs of paper again after the forms last printed upon have been torn off, and whenever desired, to issue the printed forms instead of using the mechanism, hereinafter described.

The extracting-frame, through the medium of belt 21 and sprocket-wheels 23 and 24, has a step by step upwardly movement which, by means of said mechanism is imparted to them every time the paper webs are advanced from one typewritten line to the next line and when the webs have been advanced the length of a form they are torn off by grasping the advanced edges thereof, stripping the same off of pins 17, 17, by an outward movement, and tearing said advanced forms off on the cutting-blade 16. When this has been done the extracting-frame is lowered to the limit of its lowest movement of the hand-wheel 26ª hereinbefore referred to, or by means of a vertically disposed yielding arm 29, which is made of a strip of spring steel secured at its upper end to the center of length of the upper bar 20 of the extracting-frame and depends downwards and outwards, below the plane of the postholes of the webs of paper and until pins 18 are in position to engage the same. When the extracting-frame is at the limit of its downward movement, this arm 29 is adapted to press rearwardly on the upper portion of the advanced portions of the webs and assist in keeping said pins projecting through the postholes of the advanced forms, also prevents forms slipping off pins while the forms are being advanced to the position where they are to be torn off.

The fingers 30, which while the said extracting-frame is moving upwards prevent its lower bar from moving too far forward, when the said frame is approaching the lower limit of its movement (fingers 30) engage the upper ends of downwardly and rearwardly inclined arms 31 that incline rearwardly and downwardly a sufficient distance to draw bar 18 to the rear to such an extent that the forward ends of pins 17 are drawn to the rear of and clear the transverse plate 15 of the discharge passage. The lower ends of these arms 31 merge into vertically disposed portions 32 that are parallel to and are spaced apart from the lower ends or bases of uprights 12 by blocks 33, to which they are suitably secured. As the fingers 30 of the bar 18 pass downward from arms 31, onto portions 32 they come in register with and snap forward through recesses 34, which latter are so positioned that the spring arms 19, 19, move forward and cause pins 17 to enter vertically elongated slots 35, 35, in plates 14 and 15 and pass through the postholes of the advanced form on the continuous strips of paper following those that have been extracted.

The end of shaft 26, opposite hand-wheel

26ª extends through its bearings in cranes 11, and has a pinion 36 securely mounted thereon. This pinion meshes with a gear 37, which is loosely journaled on a suitable stud secured to and projecting from the adjacent crane 11. This gear is engaged at its lowest segment and driven through the medium of a smaller gear 38 that is securely mounted on a transverse shaft 39 next the adjacent side-frame D. This shaft is journaled in the crane 11 of the carrier, and next gear 38 a ratchet 41 is securely mounted thereon between the side-frame D and a bracket 42 in the center of the disk-shaped end of which shaft 39 is journaled. This bracket has its forward end secured in any suitable manner to the side-frame D and its rear disk-shaped portion unattached. The ratchet 41 has an intermittent right to left movement and the reverse movement thereof and of shaft 39 is held by means of a brake 43, consisting of a vertically disposed yielding metal strip whose lower end is fastened to a lug 44 projecting outwards from the adjacent side-frame D and its upper unattached end provided with a V-shaped head that presses forward and engages the serrations of the ratchet. The upper segment of the ratchet 41 is engaged by a pawl 45, that is journaled in the forward arm of a U-shaped rocking-frame 46, and the pivotal boss of this pawl has a lug 47 projecting therefrom that is connected by a coil contraction spring 48 to the extremity of the other arm of said rocking-frame to keep the pointed end of pawl 45 in engagement with said ratchet 41. The pawl is moved bodily back and forth on the axis of the U-shaped rocking-frame 46 by means of a forwardly extending connecting rod 49 whose rear end is pivotally mounted on the pivotal stud at the upper extremity of the U-shaped frame, and whose forward end is pivoted on a stud 50 arising from one of the alining arms 51 of a horizontally disposed T-shaped lever 52, which latter is manually manipulated to move the paper strips upwards in front of the impression bar 10, step by step.

The arm 53 of this lever alining with arm 51 thereof is connected by a connecting-rod 54 to the mechanism of the carrier (not shown) that intermittently releases the shifting mechanism of the said carrier when it is desired to return the same to or toward its initial position. It is unnecessary to explain and describe the details of construction of this releasing mechanism, as it is or may be the same as that now in use in any well known typewriter.

The disk-shaped end of bracket 42 has a cam-surface 56 projecting upwards from its upper edge, as shown in Figure 5 of the drawings, and the upper edge of this cam is flanged laterally towards ratchet-wheel 41. The periphery of said ratchet-wheel is engaged by the pointed extremity of the pawl 45, when it is moved rearward by the proper manipulation of lever 52, and when the pawl 45 is moved to the rear, its extremity is made to engage the teeth of the ratchet-wheel by the contraction of spring 48. The movement of the ratchet-wheel imparts a corresponding motion to the gear 38, (shown in Figure 3 of the drawings), which latter as hereinbefore stated, imparts an intermittent movement to gear 37, which meshes with pinion 36 on shaft 26 and intermittently rotates sprocket-wheel 23.

Gear 37 is provided with a concentric semicircle series of holes, 57, and the end of the stud on which said gear is journaled, has a gage, 58, loosely mounted thereon, that consists of a somewhat lozenge-shaped thin metal plate loosely mounted on said stud, that has a segmental slot 59 therein through which a gage-screw, 60, is passed that is tapped into the gear 37 to retain the said gage in any circumferential position on its axis to which it can be adjusted within the limits of slot 59. The outer pointed end of this gage, has a transverse pin 61 therein, whose inner end is adapted to engage any one of the said holes 57, and whose outer end is adapted to be grasped so as to bend said gage outwards to enable it to be moved into position so that its inner end can engage any one of said holes.

Gage 58 is adjusted on gear 37 so that the pin 61 will, once during every revolution of said gear engage the underside of a rearward extension 62 of the pawl 45. The upper edge of this extension is flanged toward gear 37, and when said pin 61 engages the end of said extension nearest the point of the pawl, it lifts said pawl and prevents the same from engaging the ratchet wheel 41 and thus prevents the further movement of said ratchet and the other mechanism actuated by lever 52 to intermittently elevate the extractor-frame. When, through the medium of hand-wheel 26ª the extractor-frame is returned to its lower position, pin 61 releases extension 62, and spring 48 again causes the pawl to press toward the center of shaft 39 and to engage said ratchet-wheel 41. Adjusting the extent of the movement of gear 37 in this manner determines the length of the paper web that is to be torn off on the cutting-blade 16, and the adjusting of the pin 61 of gage 58 in the holes 57 of gear 37 toward the right determines the length of this movement.

The side of gear 37 facing crane 11, is provided with a concentric groove 63, and this groove has at a given point, a raised surface or hump 64. Once during every revolution of gear 37 this hump engages the adjacent end of a reciprocal transverse rod 65 whose ends move through suitable apertures in said cranes 11, and the end of said rod 65 is kept

bearing against gear 37 in groove 63, by means of an expansion-spring 66, surrounding the opposite end portion thereof, between the crane 11 and a collar 67 securely mounted on the same.

The forward arm of the U-shaped frame 46, is connected by a forwardly extending rod 70 to the pendent end of an arm 71, that is secured to and projects down from the extended journal of cutting-blade 16. The rear portion of rod 70 is provided with an elongated slot 72 and when said U-shaped frame 46 moves rearwardly beyond a certain point it moves the tearing-blade so that the cutting edge thereof, will move away from the rear plate 15, of the discharge passage up through which the paper is threaded, but when said frame moves forwardly beyond said certain point the pivotal stud to which the rear end of rod 70 is connected will slide in slot 72 substantially as shown, and will not impart motion to said rod.

Rod 65 is of such length that the end thereof opposite gear 37 extends through its bearings, and then is bent downwards to form a crank-shaped arm 73. The adjacent end of the journal of the tearing-blade 16, extends through its bearings and has a rearwardly projecting arm 74 fastened thereto, and the rear end of this arm 74 is engaged by a coil contraction-spring 75, the function of which is to keep the tearing-blade 16 pressing the continuous webs of paper against the rear plate 14 of the discharge-passage. The rear end of this arm 74 is also connected, through the medium of a rod 76, to an arm 77 loosely mounted on shaft 39. This arm 77 has a niche 79 in its rear edge, and when said arm is moved forward by the movement of the tearing-blade in the manner hereinbefore described, and the rod 65 is synchronously reciprocated by the hump 64 in the circular groove 63 of the gear 37, the laterally projecting end of the crank arm 73 will catch in said niche 79 and retain said arm 77 in its forward position, and, through the medium of the rod 76 arm 74 keeps the tearing-blade away from the plate 15 of the discharge passage while the paper strips are being extracted upwards therethrough.

The entire structure embodying my improvements is pivoted on shaft 39, by means of lugs 80, 80, depending from the lower edges of end-frames D, D′, and the said structure is kept in the position shown in the drawings by means of a leg 81 that is pivotally connected to one of the cranes 11, and has its lower end or foot bearing on a cross bar 82 of the supporting framework of the typewriting machine, to cause the stops 84 projecting laterally from the lower front portions of the side-frames D, D′, to bear down upon the upper edges of the side-frames of the carrier, G, substantially as shown. In order to tilt the improved structure the leg is swung rearwards and the front end of the same is lifted bringing arm 83 into contact with bar 82 and thereby opening blade 16 through the medium of arm 77, rod 76 and arm 74, while the carrier is tilted back. When in this latter position the webs of paper can be easily passed around rollers a^2, b^2, and c^2 in front of the platen and through the discharge-passage, as shown in Figure 3 of the drawings, and then the said structure can be returned to and retained in its first described position in the manner and by the means hereinbefore described.

What I claim as new is:

1. The combination in a typewriting machine with a platen and means for supplying thereto a continuous strip of paper that is provided with a series of equi-distant postholes, reciprocal devices for engaging said postholes and withdrawing said strip step by step from said platen.

2. The combination in a typewriting machine with a platen, and means for supplying thereto a continuous strip of paper that is provided with a series of equi-distant postholes, of a vertically reciprocable frame that moves upward step by step and devices mounted thereon that engage said postholes and withdraw said strip from said platen step by step.

3. The combination in a typewriting machine with a platen, and means for supplying thereto a continuous strip of paper that is provided with a longitudinally disposed series of equi-distant postholes, of a vertically reciprocable frame that is moved upwards step by step, and yielding pins mounted thereon that engage said postholes when said frame is at the lower limits of its downward throw and withdraws said strip as it moves upward step by step.

4. The combination in a typewriting machine with a stationary platen, and means for supplying thereto a continuous strip of paper that is provided with a longitudinally disposed series of equi-distant postholes, of a pair of uprights, a frame reciprocal thereon, yielding pins carried by the same, and means adjacent to the bases of said uprights that move said pins rearward and then release and permit the same to engage said postholes.

5. The combination in a typewriting machine with a stationary platen, and means for supplying thereto a continuous strip of paper that is provided with a longitudinally disposed series of equi-distant postholes, of a pair of uprights, a frame reciprocal thereon, yielding pins carried by the same, means adjacent to the bases of said uprights that move said pins rearward and then release and permit the same to engage said post-

holes, an endless belt to which said frame is attached, and means for imparting an intermittent upward movement thereto.

6. The combination in a typewriting machine with a platen, and means for supplying thereto a continuous strip of paper that is provided with a longitudinally disposed series of equi-distant postholes, of a vertically reciprocal frame that is moved upwards step by step, yielding pins mounted thereon that engage said postholes when said frame is at the lower limits of its downward throw and withdraws said strip as it moves upward step by step, and a spring for retaining said strip in engagement with said pins as said frame moves upward.

7. The combination in a typewriting machine with a platen, and means for supplying thereto a continuous strip of paper that is provided with a longitudinally disposed series of equi-distant postholes, of a vertically reciprocable frame that is moved upwards step by step, a cross-bar, pendent springs to the lower ends of which said cross-bar is attached, and yielding pins mounted on said bar that engage said postholes when said frame is at the lower limits of its throw and withdraws said strip as it moves upwards step by step.

In witness whereof I have hereunto set my hand and seal this 12 day of March, 1921.

LOUIS JENSEN.

Witnesses:
LEWIS BARKER,
E. J. BARKER.