

No. 861,425.

PATENTED JULY 30, 1907.

W. L. BARSTOW.
ENVELOP FORMING MACHINE.
APPLICATION FILED MAY 16, 1906.

6 SHEETS—SHEET 1.

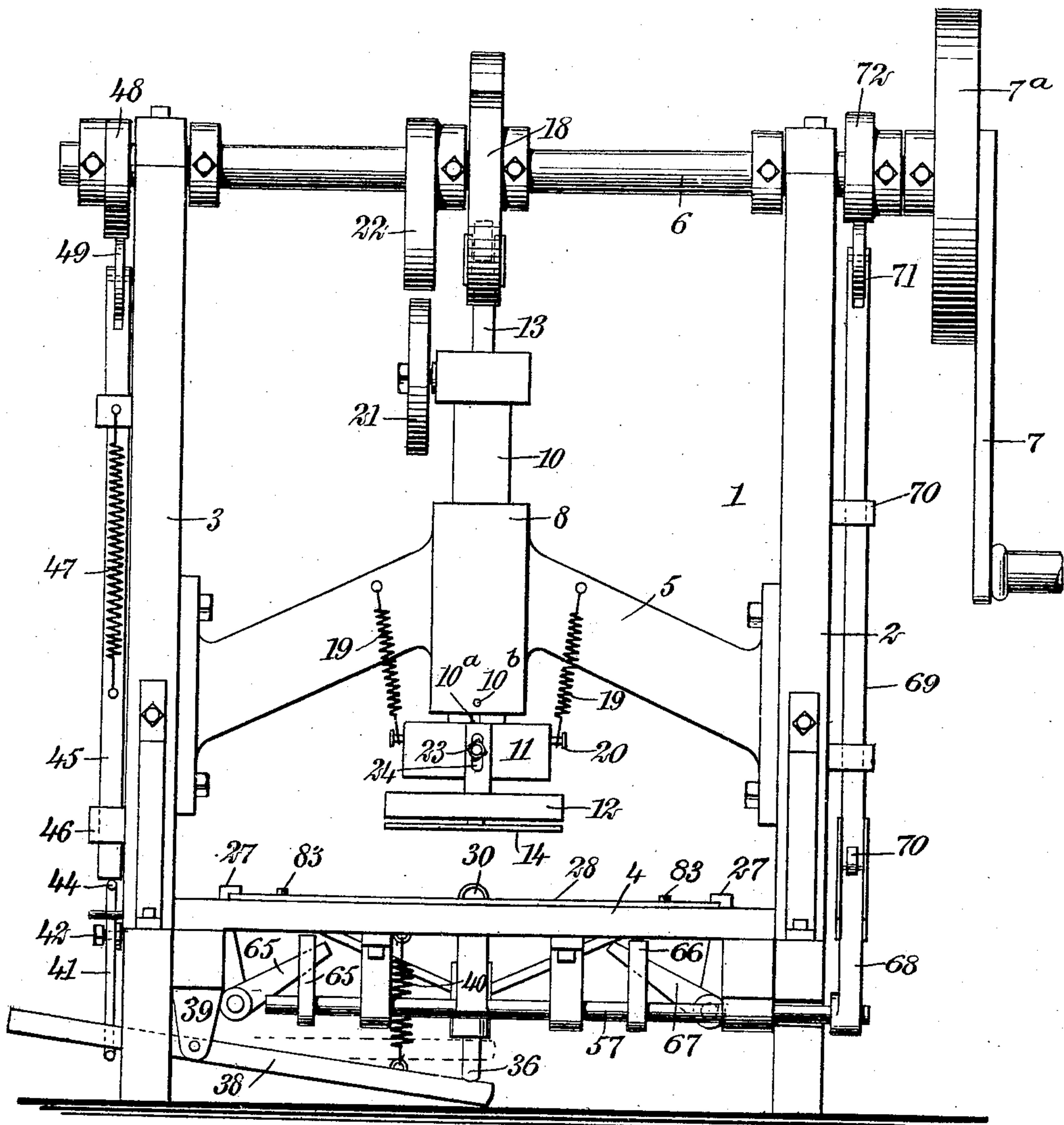


Fig. 1

WITNESSES

John A. Bergstrom
F. H. Dummer

INVENTOR.

Walter L. Barstow

BY *Mum & Co*

ATTORNEYS

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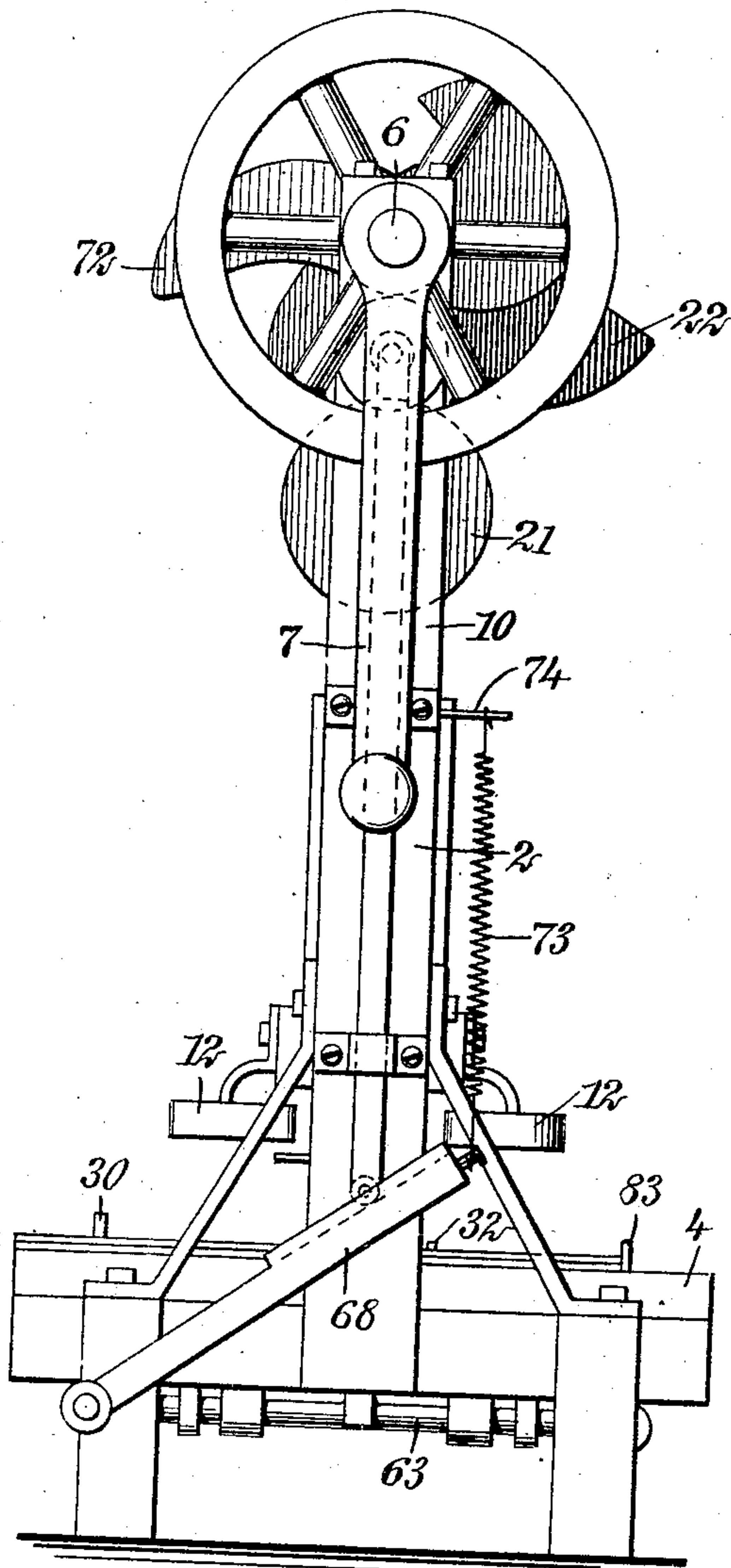


Fig. 2

WITNESSES

John A. Bingham
J. H. Ammer

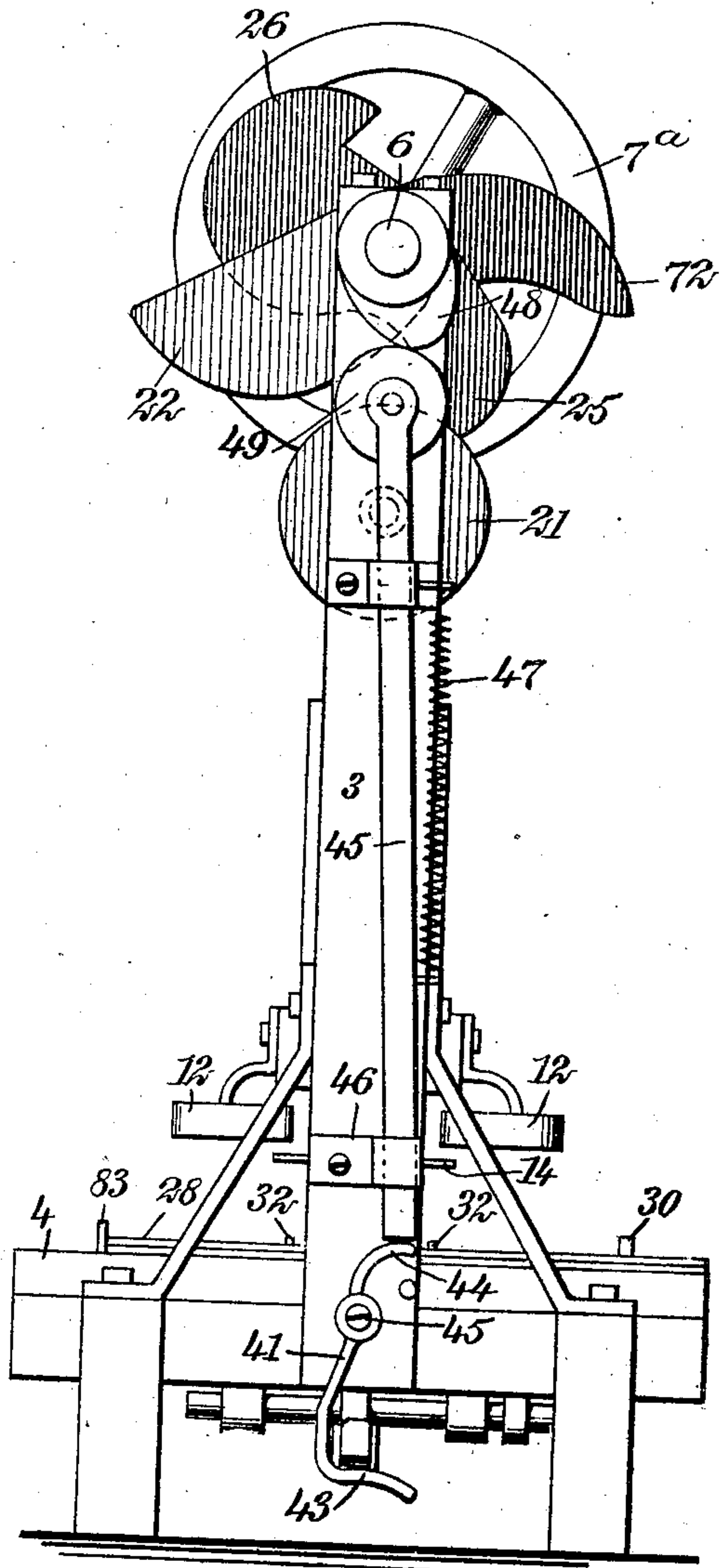


Fig. 3

INVENTOR

Walter L. Barstow

BY *Mumma & Co.*

ATTORNEYS

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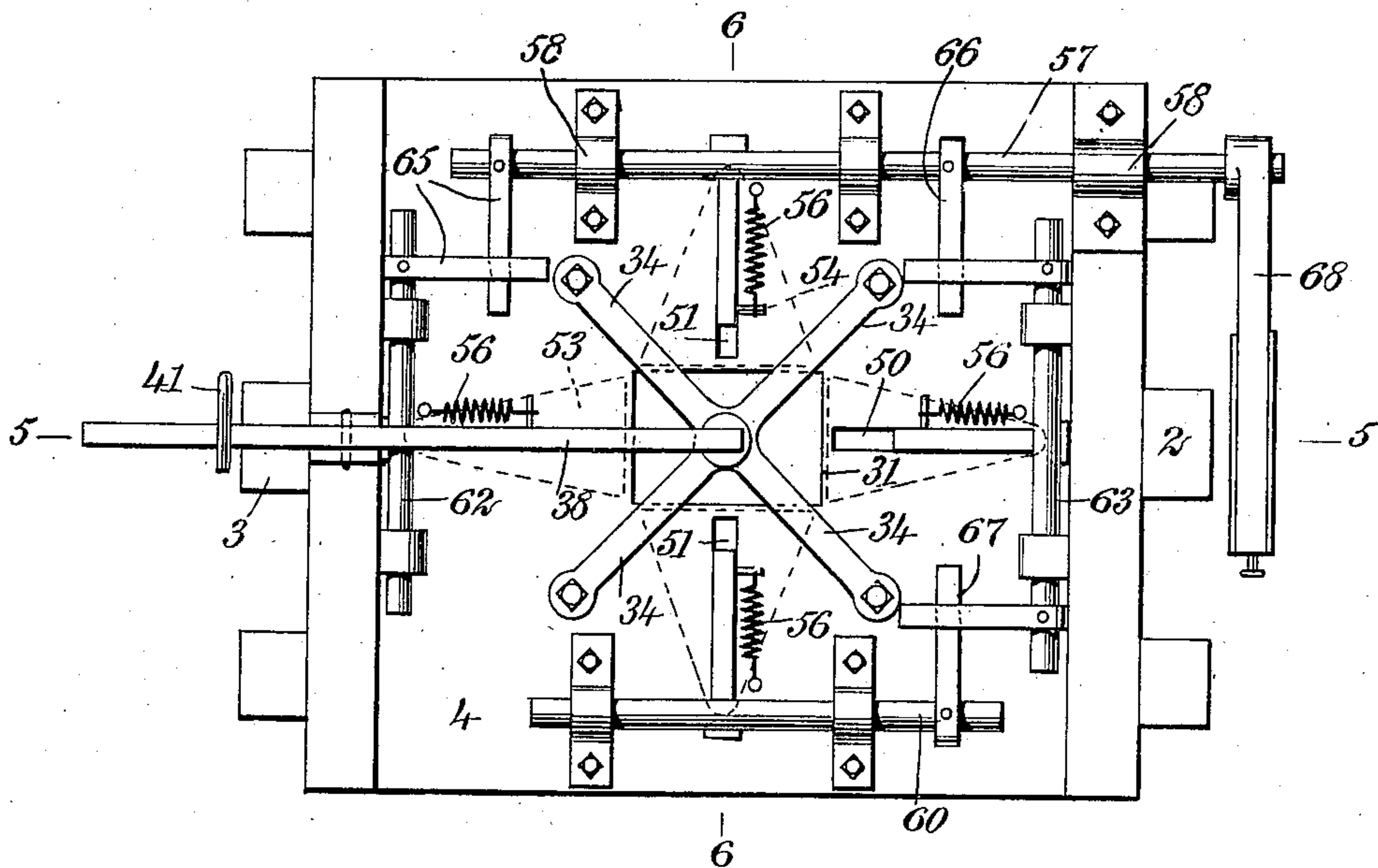


Fig. 4

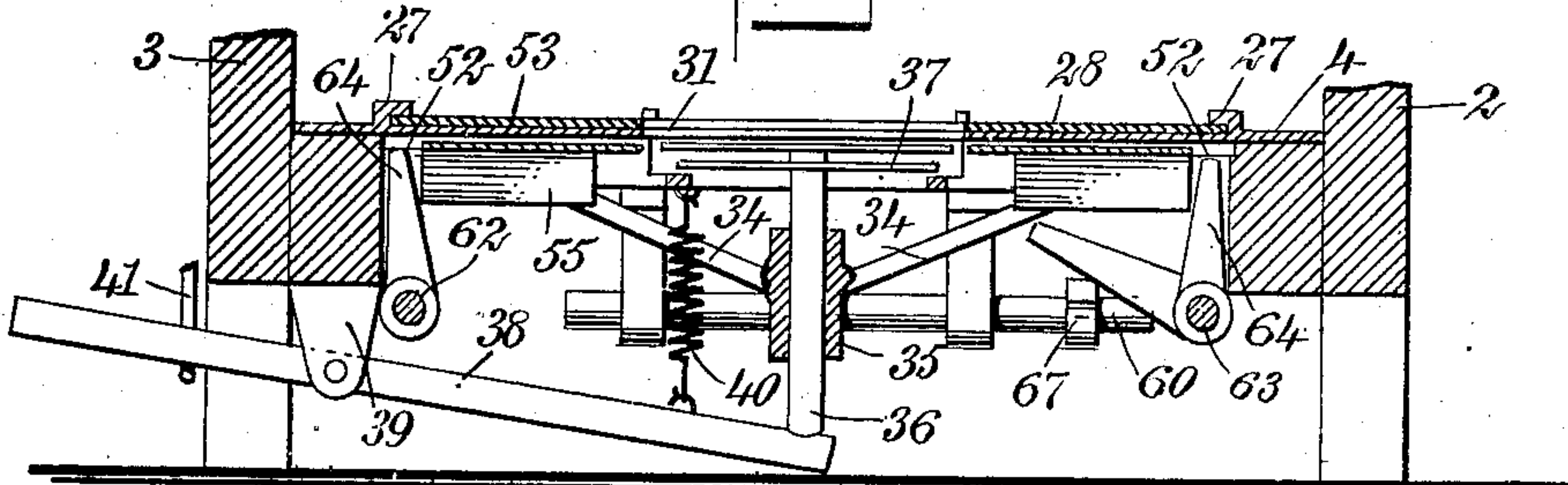


Fig. 5

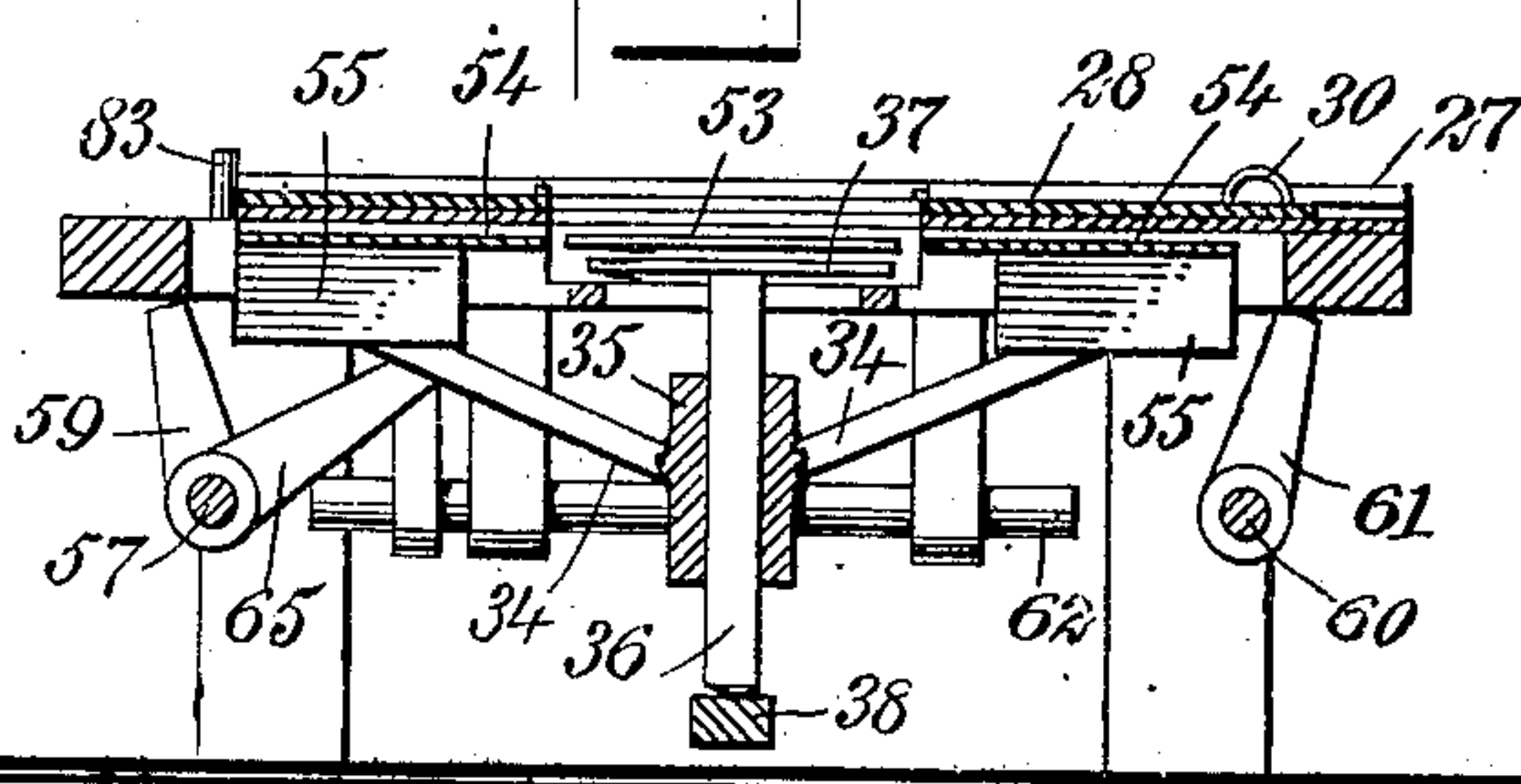


Fig. 6

WITNESSES

John A. Beystrom
J. H. Munroe

INVENTOR

Walter L. Barstow

BY *Munroe & Co.*

ATTORNEYS

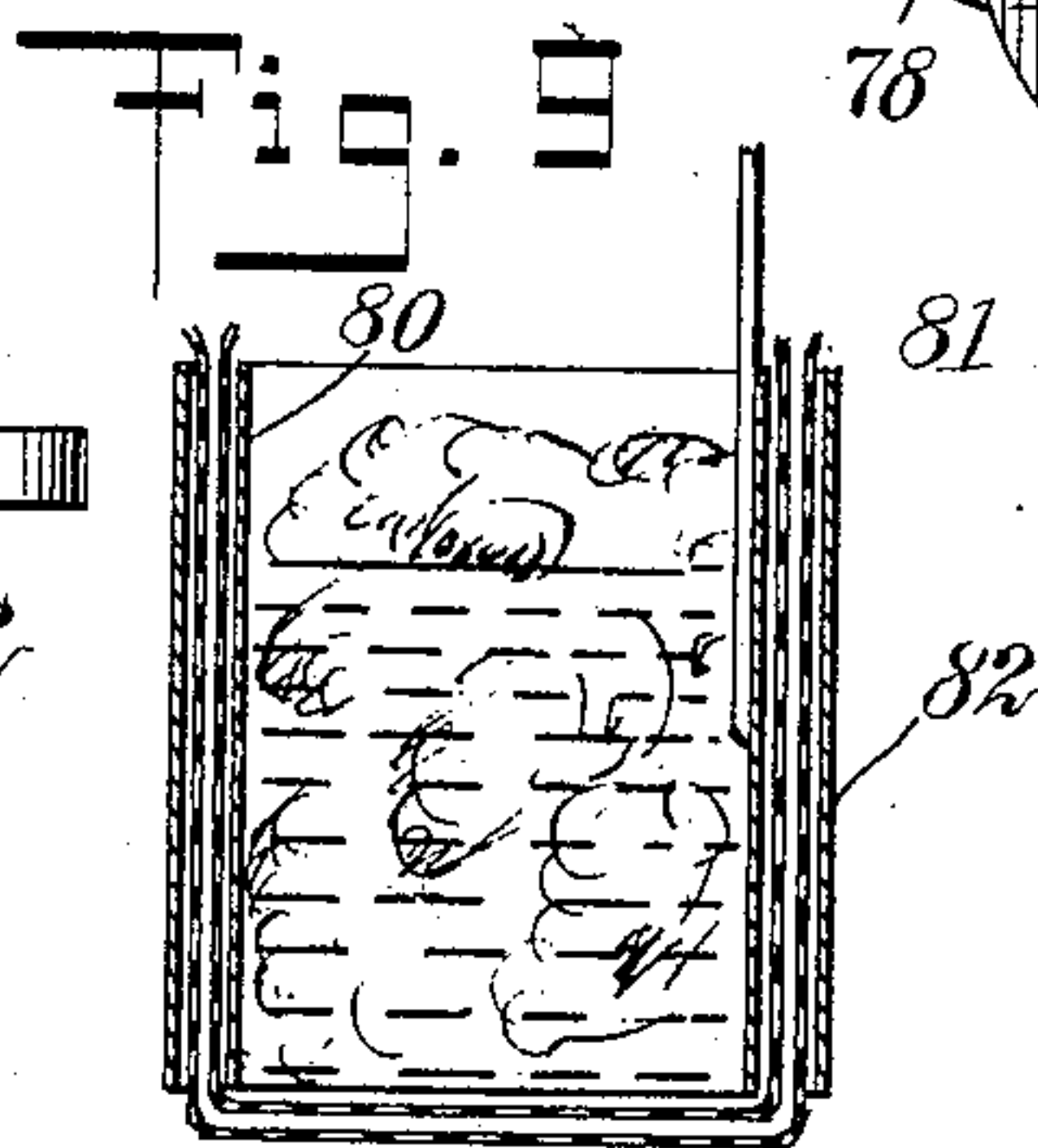
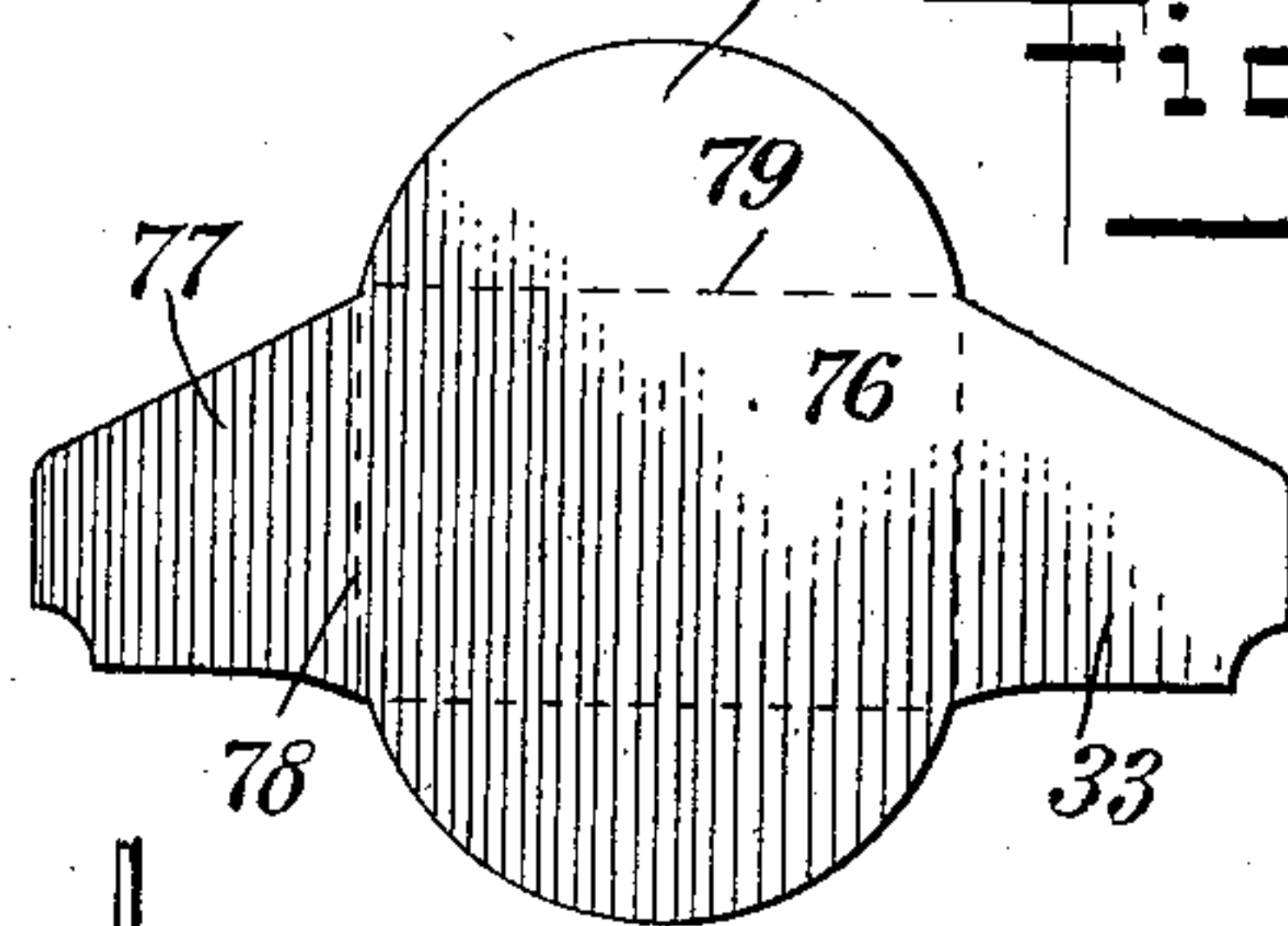
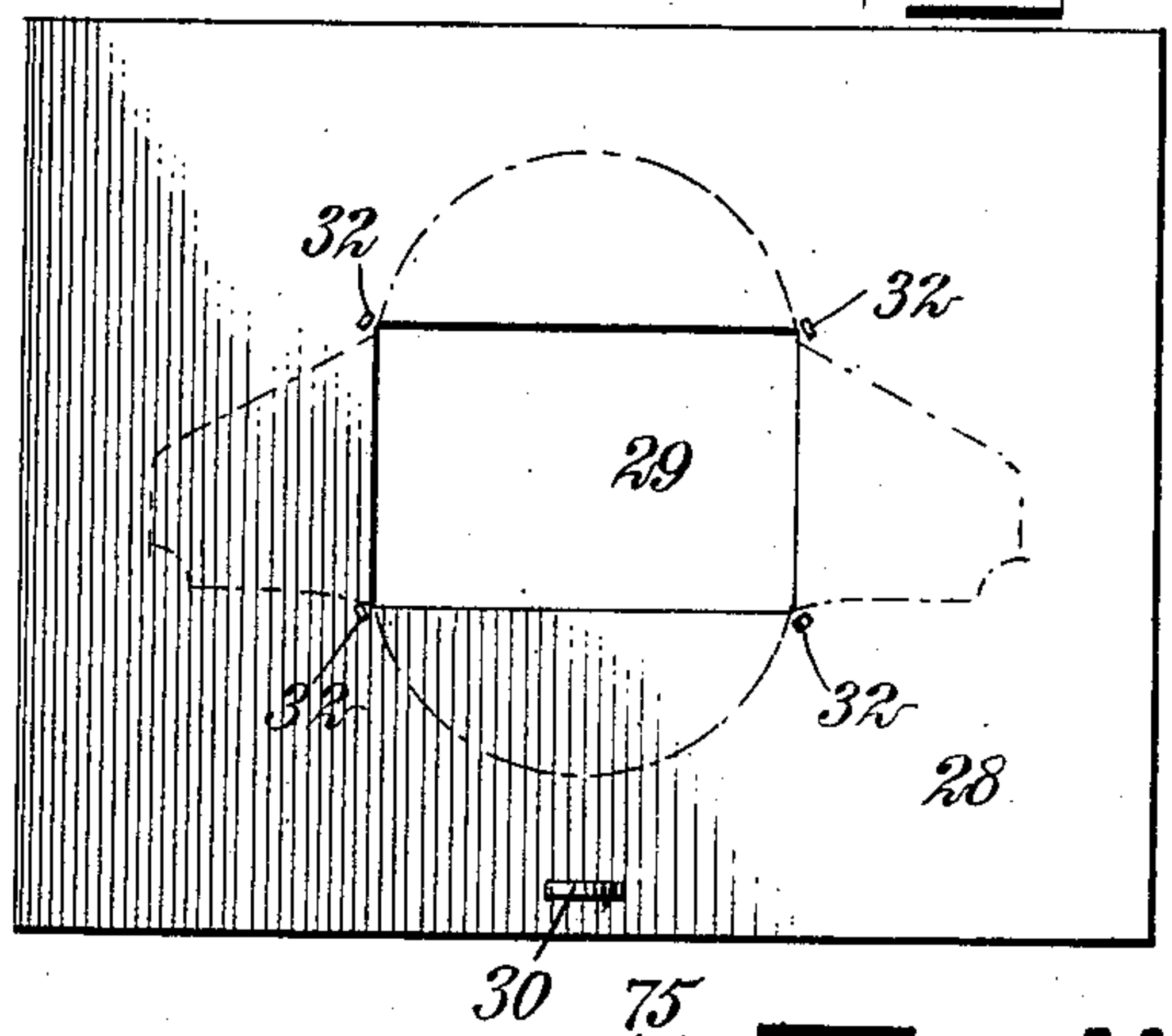
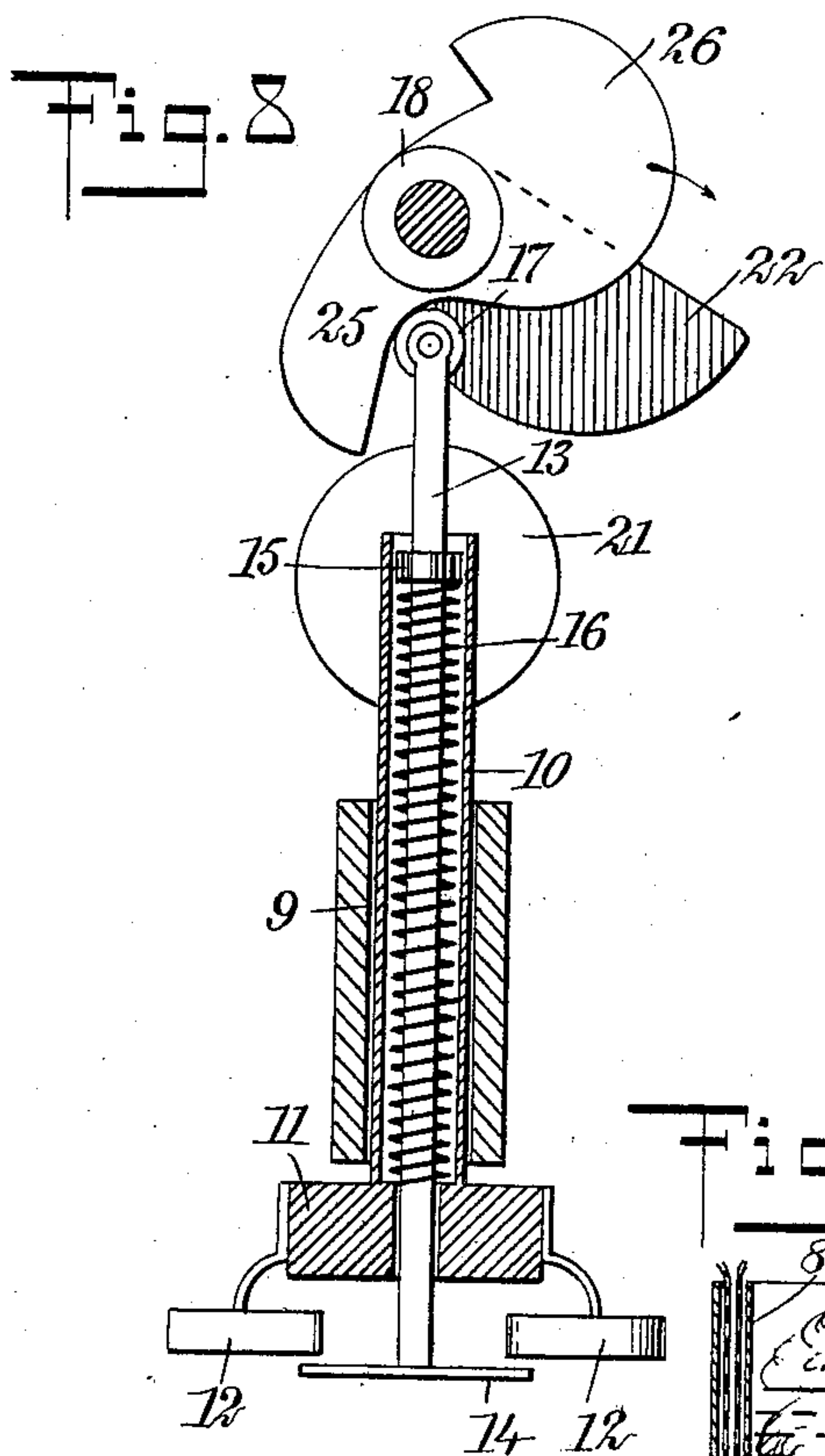
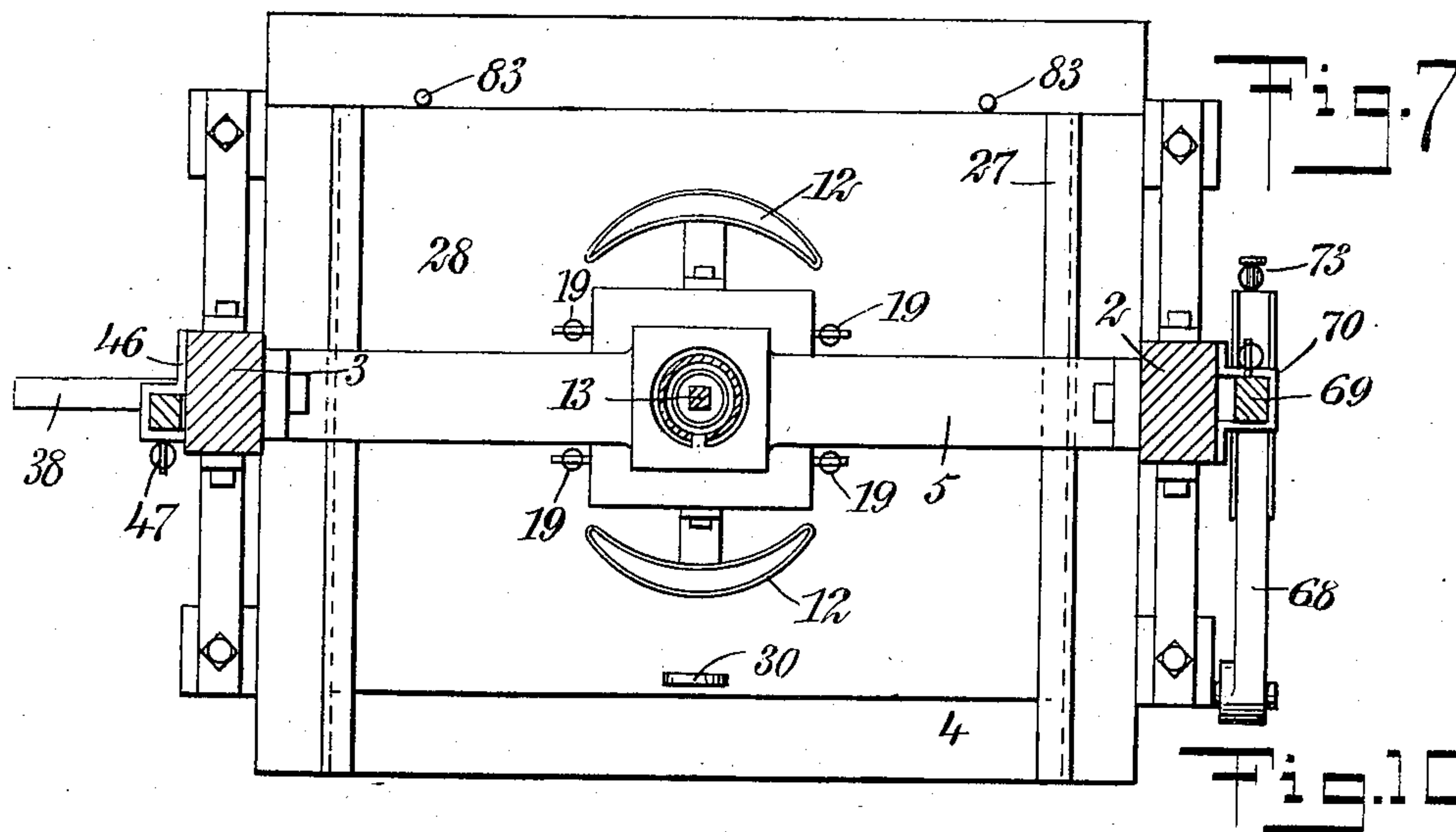
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6 SHEETS—SHEET 4.



WITNESSES
John A. Bergstrom
J. A. Ruman

INVENTOR
Walter L. Barstow
BY *Murphy & Co*
ATTORNEYS

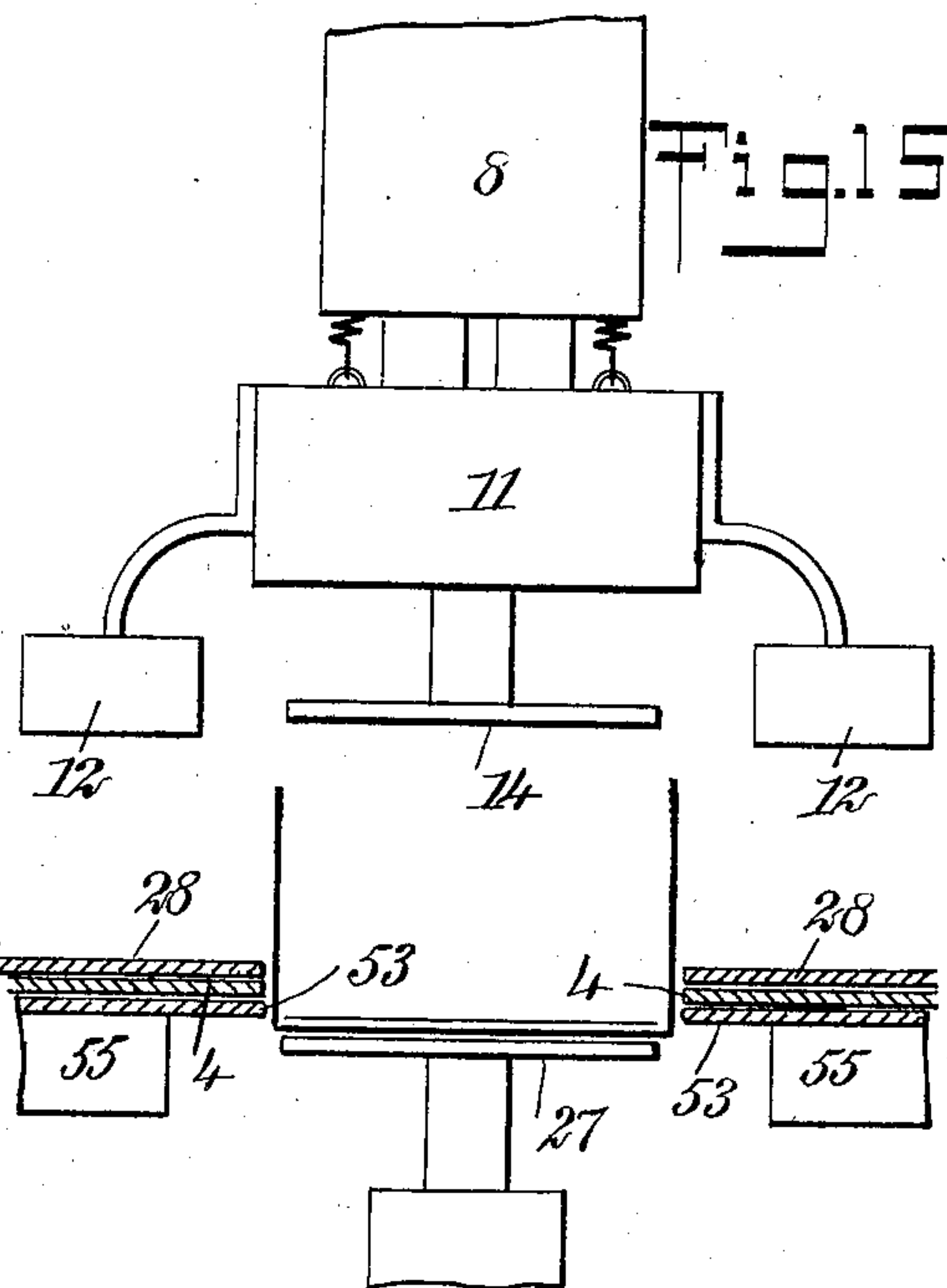
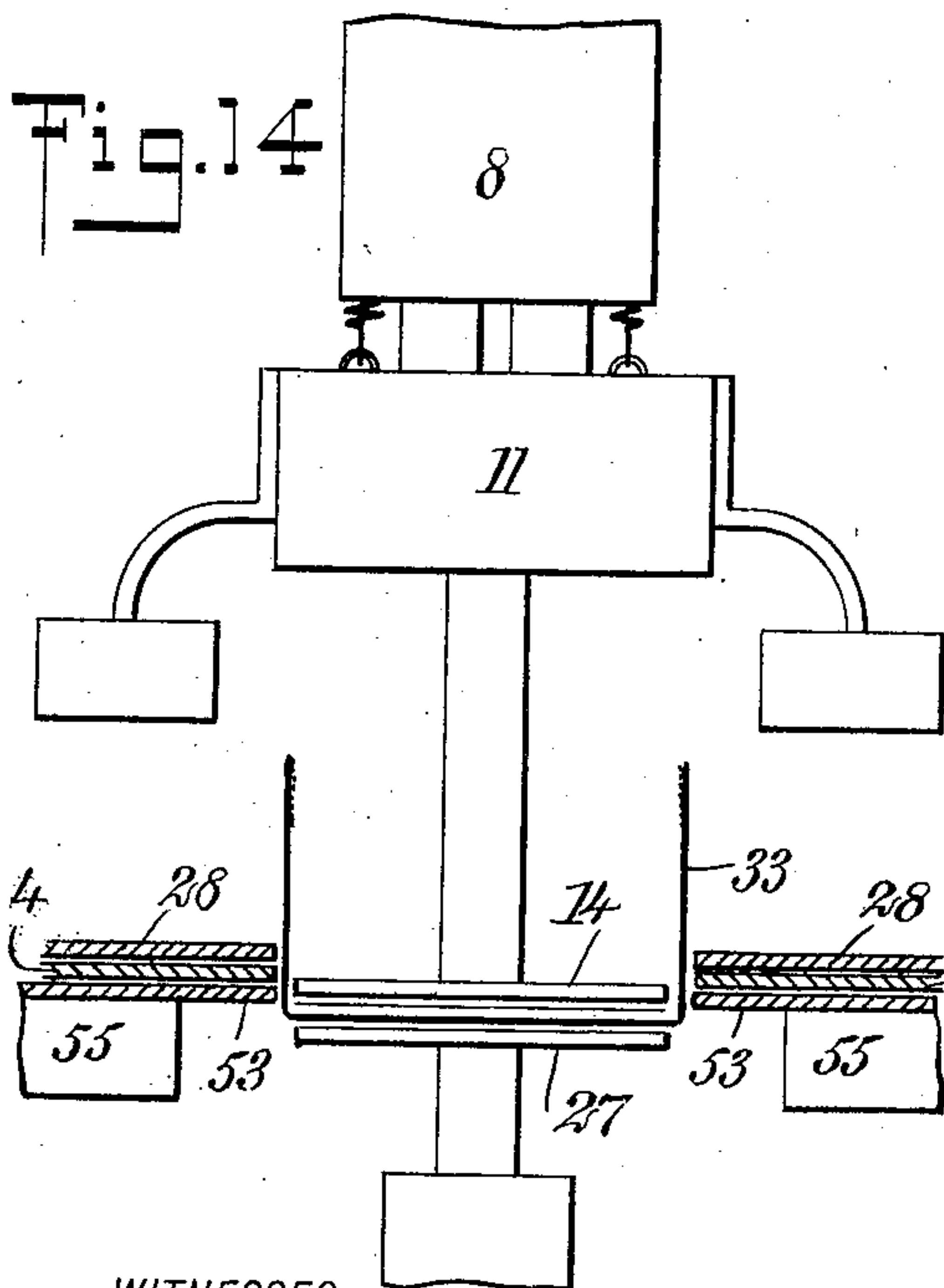
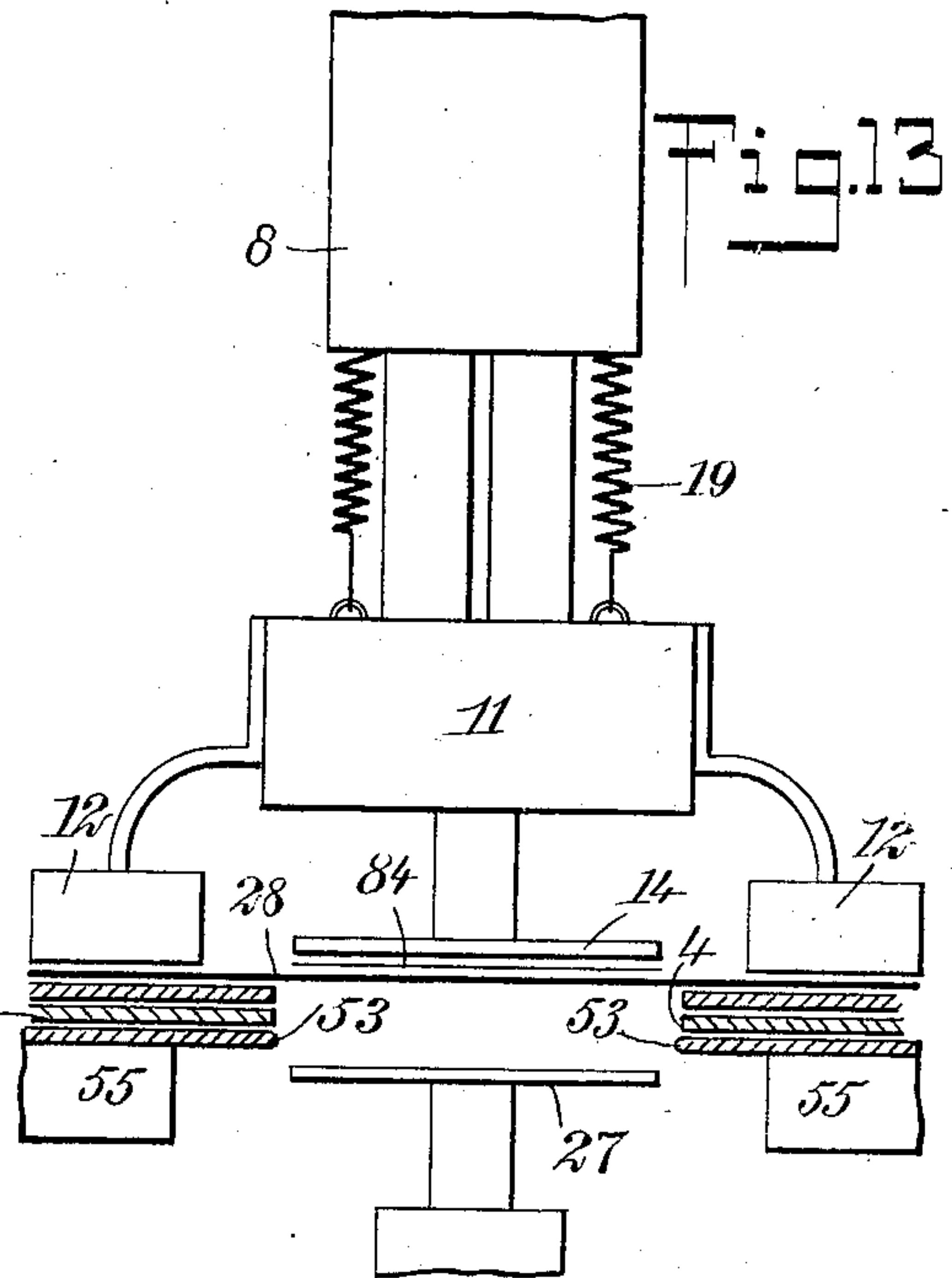
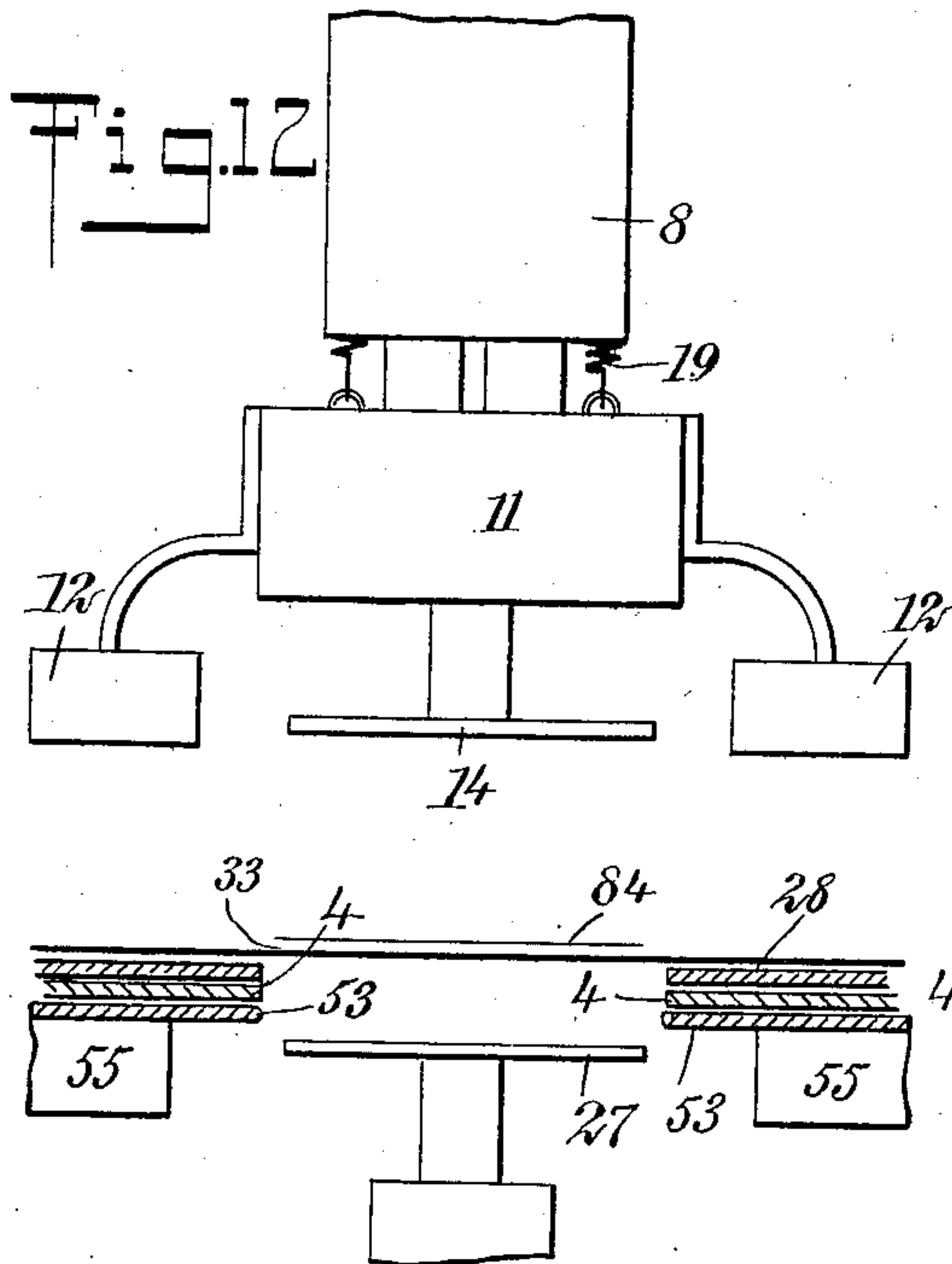
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6 SHEETS—SHEET 5.



WITNESSES

John A. Bingham
J. H. Bingham

INVENTOR

Walter L. Barstow

BY *Mum & Co*

ATTORNEYS

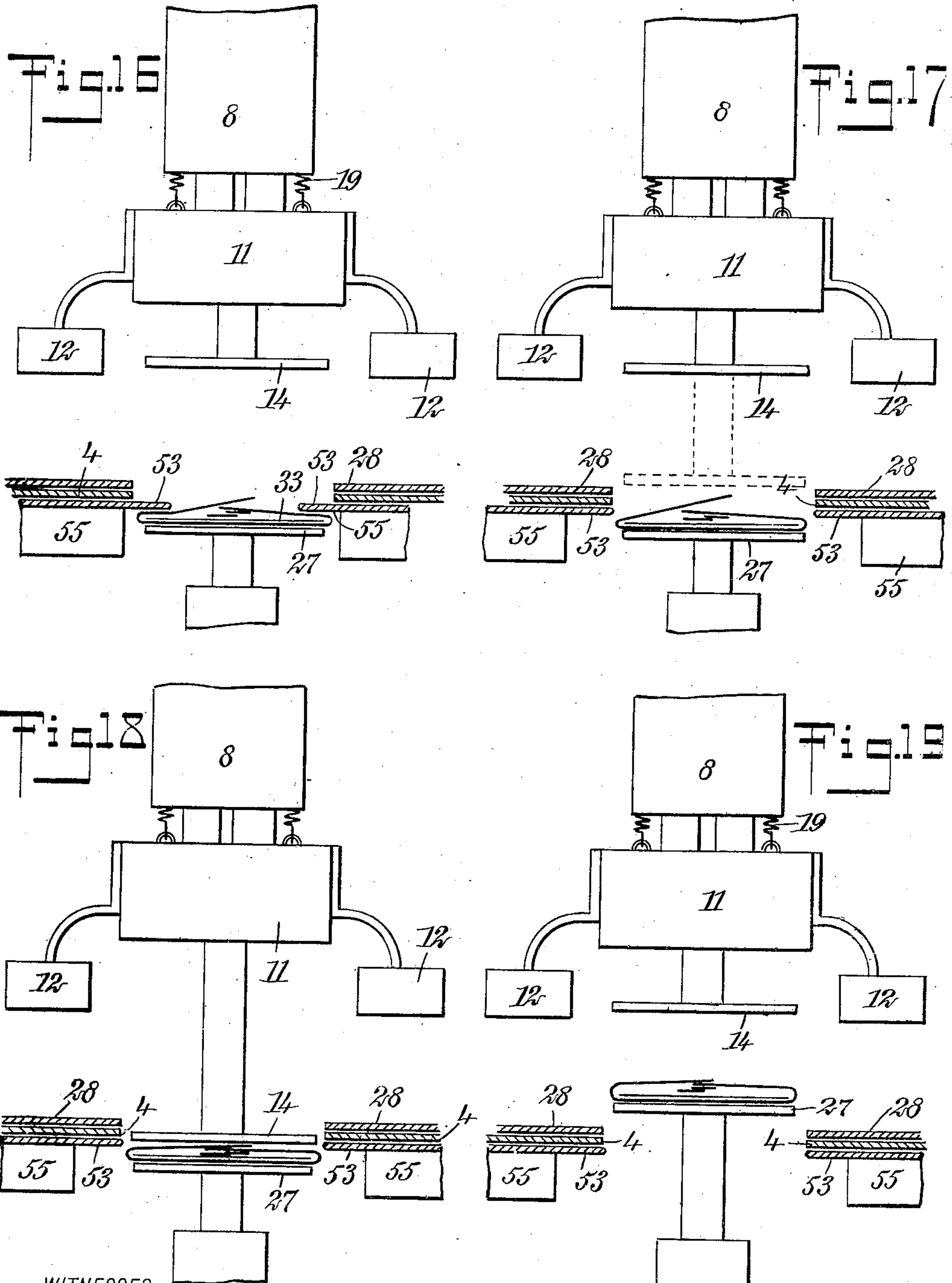
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6 SHEETS—SHEET 6.



WITNESSES
John A. Buxton
J. R. Buxton

INVENTOR
Walter L. Barstow
BY *Mumma*
ATTORNEYS

UNITED STATES PATENT OFFICE.

WALTER LOUIS BARSTOW, OF VICKSBURG, MISSISSIPPI.

ENVELOP-FORMING MACHINE.

No. 861,425.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed May 16, 1906. Serial No. 317,085.

To all whom it may concern:

Be it known that I, WALTER LOUIS BARSTOW, a citizen of the United States, and a resident of Vicksburg, in the county of Warren and State of Mississippi, have invented a new and Improved Envelop-Forming Machine, of which the following is a full, clear, and exact description.

This invention relates to envelop-forming machines.

Where a great number of circulars or letters are to be placed in envelopes, considerable time is consumed in opening the envelopes to insert the letter or circular, and there is also a loss of time in sealing the same. The cost of finished envelopes is far higher than the cost of the blanks from which the envelopes are formed.

The object of this invention is to produce a machine which is adapted to be used for the purpose of forming envelopes about a circular or letter which is to be sent by mail; the arrangement being such that the envelop will be formed and sealed at substantially the same operation.

The invention is expected to be especially useful in large offices from which a large quantity of mail matter is sent out.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of the machine, a portion of the operating crank being broken away; Fig. 2 is an elevation showing the machine from the right side as viewed in Fig. 1; Fig. 3 is an elevation showing the machine from the left side as viewed in Fig. 1; Fig. 4 is a reversed plan of the machine; Fig. 5 is a cross section taken on the line 5—5 of Fig. 4; Fig. 6 is a cross section on the line 6—6 of Fig. 4; Fig. 7 is a horizontal section taken through the upper portion of the machine, showing the lower portion thereof in plan; Fig. 8 is a vertical cross section through the center of the machine and illustrating especially the means for operating the presser plate and daubers; this view is upon an enlarged scale; Fig. 9 is a cross section through one of the daubers; also upon an enlarged scale; Fig. 10 is a plan showing a slide plate which constitutes a feature of the invention; Fig. 11 is a plan showing a blank from which the envelop is formed, and indicating the manner in which the same is folded to form the envelop; Fig. 12 is a diagrammatic view showing the relation of the parts when the operation is about to commence; Fig. 13 is a view similar to Fig. 12, but showing the first step in the folding operation; Fig. 14 is a view similar to Figs. 12 and 13, but representing the next step in the operation, which is the first step in the actual folding of the envelop flaps; Fig. 15 is a view simi-

lar to Fig. 14 but representing the presser plate as withdrawn, the flaps of the envelop being ready to be folded by other mechanism; Fig. 16 is a view similar to Figs. 12 to 15, but representing the flaps of the envelop in the operation of being folded inwardly; Fig. 17 is a view similar to Fig. 16, but representing the plates which fold the flaps of the envelopes as withdrawn, and the presser plate in the act of descending upon the folded envelop in order to seal the same; Fig. 18 represents the parts with the presser plate against the envelop in the act of sealing; and Fig. 19 is a view representing the last stage of the operation, the presser plate having been withdrawn and the envelop delivered by an upward movement of the bed plate.

Referring more particularly to the parts, 1 represents the frame of the machine, which comprises a pair of oppositely disposed standards 2 and 3, which support between them, at a slight elevation, a platen 4. Above this platen the standards or columns 2 and 3 are connected by a rigid cross-head 5 and in the upper extremities of the columns, a main driving shaft 6 is rotatably mounted, the said shaft having a fly-wheel 7^a and a crank 7. The cross head 5 is provided with a central hub 8 which is formed with a vertical bore 9 which constitutes a guide for a dauber plunger 10, the said dauber plunger being of tubular form and terminating below in a head 11 to which daubers 12 are attached, as indicated most clearly in Fig. 8. Within this tubular plunger a stem 13 is guided, which stem passes through the head 11, as shown, and carries a presser plate 14. Near the upper extremity of the plunger 10, the stem 13 is provided with a fixed collar 15 and beneath this collar there is arranged a spring 16 of helical form which is disposed around the stem 13, the lower extremity of the said spring thrusting against the head 11. From this arrangement, the spring operates normally to maintain the stem 13 in an elevated position. The upper extremity of the stem 13 carries a roller 17 which is held by means of the spring against the face of a cam 18. As indicated most clearly in Fig. 1, the head 11 is normally held in an elevated position by means of helical springs 19 which are attached to the cross head 5 and to pins 20 projected from the head 11. To prevent the plunger from rotating, it is provided with a longitudinal slot 10^a into which projects a pin 10^b on the hub 8.

To the upper extremity of the plunger 10 a large roller 21 is attached, and the springs 19 aforesaid afford means for holding the periphery of this roller against a cam 22 which is carried by the shaft 6, to which shaft is also rigidly attached the aforesaid cam 18. On the forward and rear sides of the head 11 the daubers 12 are attached, as indicated, the same being vertically adjustable by means of bolts 23 which pass through vertically disposed slots 24.

The cam 18 is formed with a small extension or toe

25 and a large extension 26 which projects in the opposite direction. The extension 25 preferably has substantially the form shown in Fig. 8, and this toe I shall call the sealing toe, as its purpose is to depress the presser plate 14 when the same is sealing the envelop. The function of the extension 26 is to depress the presser plate 14 when the envelop is being folded. The function of the cam 22 is to depress the daubers 12 so as to apply mucilage to the envelop flaps in a manner which will be described more fully hereinafter, and this cam I call the dauber cam.

On the upper side of the platen 4 I provide a pair of transverse cleats 27 which constitute guides to receive the edges of a slide plate 28. This slide plate is formed at its center with an opening 29 of substantially rectangular form, and this opening has substantially the same dimensions as the finished envelop. Near its forward edge the plate 28 is formed with a projection 30 to facilitate its being drawn toward the front of the machine or forced into a central position; when in its central position, the opening 29 is disposed just beneath the presser plate 14 so as to aline substantially with a corresponding opening 31 which is formed in the flap. On the upper surface of the slide plate 28, nibs 32 project upwardly at the corners of the opening 29, and these are adapted to assist in holding the blank 33 in the manner indicated in Fig. 10, the blank being represented in dotted outline.

On the under side of the platen 4 I provide a spider 34, the arms whereof are rigidly attached to the platen as indicated most clearly in Figs. 4 and 5. This spider is formed with a central hub 35 which is disposed in alinement with the central axis of the stem 13. To the hub 35 a stem 36 is guided vertically, and this stem carries at its upper extremity a bed plate 37. This bed plate 37 is of rectangular form and of slightly smaller dimensions than the openings 31 and 29. The lower extremity of the bed plate stem 36 is supported upon a resilient lever 38 which is pivotally mounted near the side of the machine upon a suitable bracket 39. The long arm of the lever 38 which lies under the machine has attached thereto a spring 40, the upper extremity whereof is attached at a point beneath the platen, so that this spring has a tendency to force the bed plate upwardly, as will be readily understood. In order to enable the bed plate to be locked in a depressed position as indicated in Fig. 4, I provide, at the left side of the machine, a catch 41 which is pivoted to the outer side of the column 3 at the point 42; this catch is formed of a stout rod, the lower extremity whereof is bent into a hook 43 which is adapted to engage the lower edge of the lever as indicated in Fig. 3; in this way the lever may be held in the position shown in Fig. 5, with the stem 36 depressed. The catch 41 is formed above with a laterally projecting toe 44 and against this toe there rests the lower extremity of a resilient bar 45, the same being guided through suitable brackets 46 on the side of the column, as indicated. A spring 47 attached to the column affords means for holding this resilient bar 45 in contact with a resilient cam 48, which cam is carried by the aforesaid shaft 6. At the point of contact with the cam, the resilient bar is provided with a roller 49

which rolls on the face of the cam. As indicated most clearly in Fig. 4; the platen 4 is provided with four guide slots 50, 51, which extend at right angles respectively to the edges of the openings 29 and 31, and centrally with respect to each other. These slots are formed as indicated in Fig. 5, with side grooves 52, which grooves support the side edges of folder plates or folders 53, 54. On their under sides these plates 53, 54 carry blocks 55 rigidly. It should be understood that these folders 53, 54 are adapted to be advanced into the space beneath the opening 29 for the purpose of folding inwardly the flaps of the envelop. They are normally maintained in a retracted position, however, by means of springs 56 which are attached to the lower side of the platen, as indicated.

I provide means for advancing the folders 54 simultaneously. For this purpose, I provide at one side of the machine, as indicated in Fig. 4, a main rock shaft 57, which is suitably mounted in bearings 58 attached to the under side of the platen. This rock shaft is provided with a dog 59 which projects upwardly and lies adjacent to the rear face of one of the blocks 55 carried by the adjacent folder 54. Opposite the rock shaft 57 there is a short rock shaft 60 which is similarly attached to the under face of the platen and provided with an upwardly projecting dog 61, and this dog lies adjacent to the rear face of the block 55 which is carried by the opposite folder 54. On the under face of the platen 4 between the rock shafts 57 and 60, transverse rock shafts 62 and 63 are rotatably attached in any suitable manner, as shown, and these rock shafts 62 and 63 are provided with dogs 64 which project upwardly as shown and lie adjacent to the rear edges of the blocks 55 which are carried by the folders 53.

I provide means, to be described hereinafter, for rocking the main rock shaft 57. This rocking movement is transmitted to the rock shaft 62 by means of toes 65 carried respectively by the rock shaft 57 and the rock shaft 62, the said toes projecting toward each other and engaging near their extremities as shown in Fig. 4. By means of similar toes 66 which are attached respectively to the shaft 57 and the shaft 63, this rocking movement is transmitted also to the shaft 63, and this shaft, in turn, transmits a rocking movement to the shaft 60 through the medium of similar toes 67 which attach respectively to the shaft 60, as indicated. From this arrangement it should be understood that when the rock shaft 57 is rocked, the folders 53 and 54 will be moved in and out under the opening 29. In order to rock the shaft 57, the said shaft is provided at one side with lever 68, as indicated most clearly in Fig. 2; the said lever projects upwardly at the side of the machine and its upper extremity lies near the side of the column 2. On the side of this column there is guided, in a vertical direction, a folder bar 69, the same passing through suitable brackets 70 for this purpose. The lower extremity of this folder bar 69 is provided with a roller 71 which rolls upon the upper face of the lever 68, as indicated most clearly in Fig. 2, and the upper extremity of this folder bar carries a roller 71^a which is normally held against the face of a folder cam 72, which cam is rigidly carried by the shaft 60 aforesaid. In order to hold the roller 71^a in engagement with the cam 72, I provide a spring 73, the lower extremity whereof

attaches to the extremity of the lever 68, the upper extremity of the spring being attached to a pin 74 projecting from the side of the column, as indicated.

Referring again to the daubers 12, it should be stated that, as illustrated in Fig. 7, they are of curved or crescent form, their concave sides being disposed inwardly. The form of these daubers is such as to facilitate the application of mucilage near the outer edge of the outside folding flaps 75 of the envelop blank 33. This blank 33 has a substantially rectangular body 76 with side or end flaps 77, of any suitable form such as that shown. It should be understood that in folding the envelop flaps 77 are first folded inwardly upon the dotted lines 78, as indicated in Fig. 11, and the flaps 75 are then folded upon the lines 79 so as to come down upon the flaps 77. In this way an envelop is formed, and by reason of the mucilage which is supplied previously by the daubers 12, the envelop is immediately sealed. The construction of one of the daubers 12 is clearly shown in Fig. 9; it is formed of an inner body 80 which is bottomless as shown, the lower side of the inner body being closed by sheets 81 of suitable fabric, which is held in position by an outer body or keeper 82 which slips over the inner body 80 from the under side as indicated. In this connection it should be understood that the outer body fits snugly upon the inner body and constitutes a retaining ring or band for the sheets of fabric. In the interior of the inner body I place a quantity of mucilage, together with a suitable absorbent material such as sponge or cotton. With this arrangement it should be understood that if the lower faces of the daubers are applied to the surface, a quantity of mucilage will be deposited.

The mode of operation of the machine will now be described: Parts of the machine being in the relation shown in Figs. 1 to 3 inclusive, the slide plate 28 is drawn outwardly so as to enable an envelop blank 33 to be placed thereupon, in the relation indicated in Fig. 10; that is, with the nibs 32 of the plates received in the angles between the projecting flaps. I then lay centrally on the blank the inclosure 84 about which the envelop is to be formed. Having deposited the blank in the manner described, the slide plate is then returned to its normal central position. In doing so its rear edge will engage with stops 83 which arrest it in a central position beneath the presser plate. The normal position of the presser plate and the plunger 10, together with their operating cams, is clearly shown in Fig. 8. Referring to this figure, it will be evident that when the crank 7 is rotated, the cam extension 26 will first come into operation, its action being to depress the presser plate 14. As the presser plate 14 moves downwardly toward the blank therebelow, as indicated in Fig. 12, the cam 22 will come into operation to depress the daubers 12 in the manner indicated in Fig. 13, so that before the presser plate engages the blank, the dauber will have applied mucilage to the outside flap 75. The cam 22 will then pass out of the path of the roller 21 and allow the daubers 12 to withdraw, as indicated in Fig. 14, while the downward movement of the presser plate continues, as indicated in this figure, until it forces the blank through the openings 29 and 31 against the bed plate 37. The cam extension 26 will then release the stem 13 so as to allow the same to be projected upwardly by its spring, with-

drawing the presser plate from the opening 29 and leaving the parts in the relation shown in Fig. 15. A movement on the folder bar 69 is now begun by the cam 72, and as this bar moves downwardly it rocks the lever 68 downwardly. This rocking movement of the lever 68 is transmitted through the main rock shaft 57 to the other rock shafts 60, 62, 63. The movement of the rock shafts 62 and 63 results immediately in producing a movement of the folders 53, which move inwardly and engage the inside flaps of the envelops. Following this movement the folders 54 move inwardly so as to fold the outside flaps of the blank inwardly, as indicated in Fig. 16. The cam 72 now permits all the folders to withdraw themselves and now the cam extension 25 comes into play to operate to depress the presser plate 14, as indicated in Fig. 17. This movement continues until the presser plate presses the folded blank upon the bed plate as indicated in Fig. 18, and this operation effectively seals the envelop. The presser plate then withdraws and the continued rotation of the shaft 6 brings the cam 48 into play. This cam operates to force the release bar 45 downwardly, which throws the hook 43 out of engagement with the releasing lever 38. The spring 40 then operates to force the stem 36 upwardly and in this way the bed plate 37 is thrown into an elevated position above the opening 29, facilitating the removal of the complete envelop, as indicated in Fig. 19.

With the machine described above, the envelop blanks may be fed into position beneath the presser plate, and the envelop will be quickly formed about the inclosure which is previously laid thereupon.

If it is desired to form ordinary unsealed envelops in which inclosures may be placed later, the folding plate corresponding to the unsealed flap will be disconnected, together with the corresponding dauber.

The edges of the opening 29 will be knurled, scored or roughened by attaching sand-paper so that they will tend to prevent the withdrawal of the blank when the press plate returns upwardly.

If it is desired to make an envelop with one flap inserted and unsealed this can be accomplished by adjusting the corresponding folder plate to move more in advance; this is possible by reason of the set screw attachment for connecting the dogs that advance the folders.

By disconnecting a pair of opposite folders the device may be used for placing wrappers on papers.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a machine of the class described, in combination, a plate having an opening therein, means for forcing an envelop blank through said opening, folders adapted to advance into the space beneath said opening to fold the flaps of the envelop, rock shafts respectively controlling said folders and having toes projecting laterally therefrom, said toes being in engagement with each other whereby the rotation of one of said rock shafts transmits a rocking movement to the remainder of said rock shafts.

2. In a machine of the class described, in combination, a bed plate, a guide therefor, a stem carrying said bed plate and passing through said guide, a lever engaging the lower extremity of said stem, a spring tending to force said lever in a direction to elevate said bed plate, a latch affording means for locking said lever with said bed plate in a depressed position, means for forming an envelop on said bed plate, and automatic means for releasing said latch.

3. In a machine of the class described, in combination, a tubular plunger carrying daubers adapted to apply an adhesive substance to an envelop blank held therebeneath, means for guiding said plunger in a vertical direction, a stem passing through said plunger, a spring disposed about said stem within said plunger tending to force said stem upwardly and said plunger downwardly, and means for independently depressing said plunger and said stem.
4. In a machine of the class described, in combination, a frame, a plunger guided in said frame, springs constraining said plunger upwardly, daubers carried by said plunger and adapted to apply an adhesive substance to an envelop blank held therebeneath, a presser plate having a stem guided through said plunger, means tending to force said presser plate upwardly, and independent means for depressing said plunger and said presser plate.
5. In a machine of the class described, in combination, a frame a tubular plunger, means for guiding said plunger on said frame, daubers carried by said plunger and adapted to apply an adhesive substance to an envelop blank, a presser plate having a stem guided through said plunger, a collar rigidly carried by said stem within said plunger, a spring disposed about said stem tending to force said collar upwardly and said plunger downwardly, means tending to force said plunger upwardly, and cams coöperating with said plunger and said stem for depressing the same.
6. In a machine of the class described, in combination, a frame including a platen, a plunger guided on said frame and carrying daubers adapted to touch a blank held on said platen, said platen having an opening therethrough, a presser plate adapted to force an envelop blank through said opening, a transverse shaft, cams carried thereby controlling said plunger and said presser plate, folders beneath said platen and adapted to operate upon a blank forced through said opening, and mechanism driven from said shaft for actuating said folders.

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

WALTER LOUIS BARSTOW.

Witnesses:

JAS. C. PANNELL,

JNO. J. MCAULIFFE.