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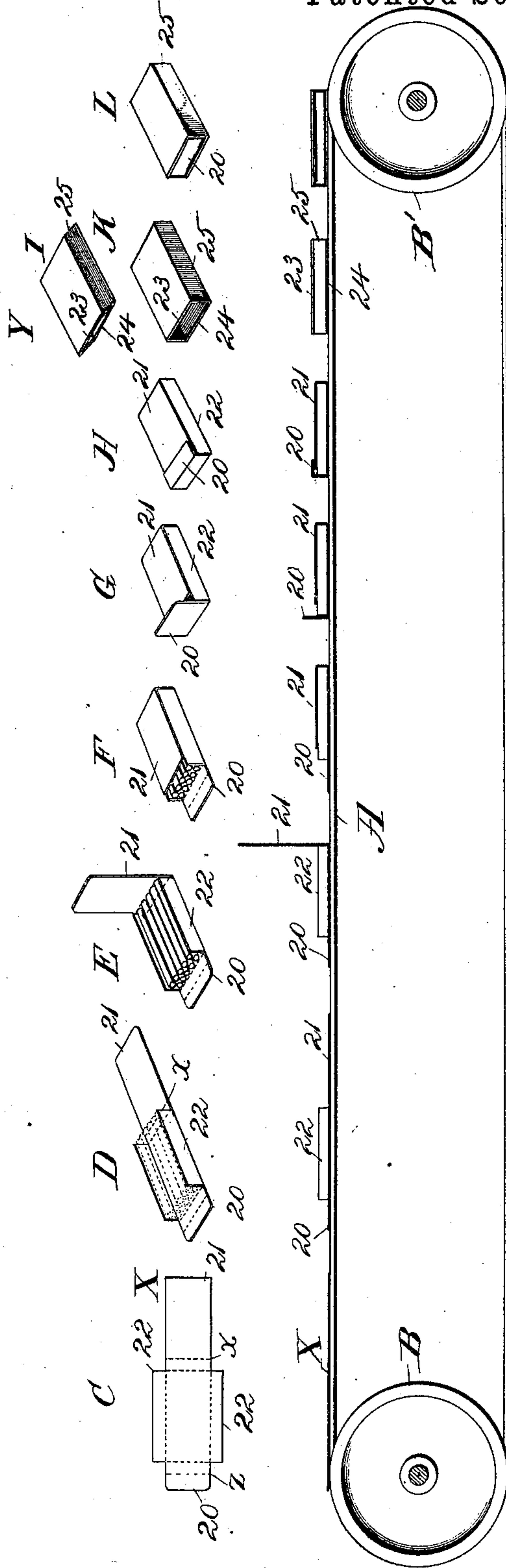
12 Sheets—Sheet 1.

C. W. VAN VLEET & A. HURD.  
CIGARETTE PACKING MACHINE.

No. 567,014.

Patented Sept. 1. 1896.

Fig. 1.



Witnesses

C. H. Marshall.  
S. P. Moore

Inventors  
Charles W. Van Vleet  
by A. A. Hurd  
Howard L. Ogden  
their Attorney

(No Model.)

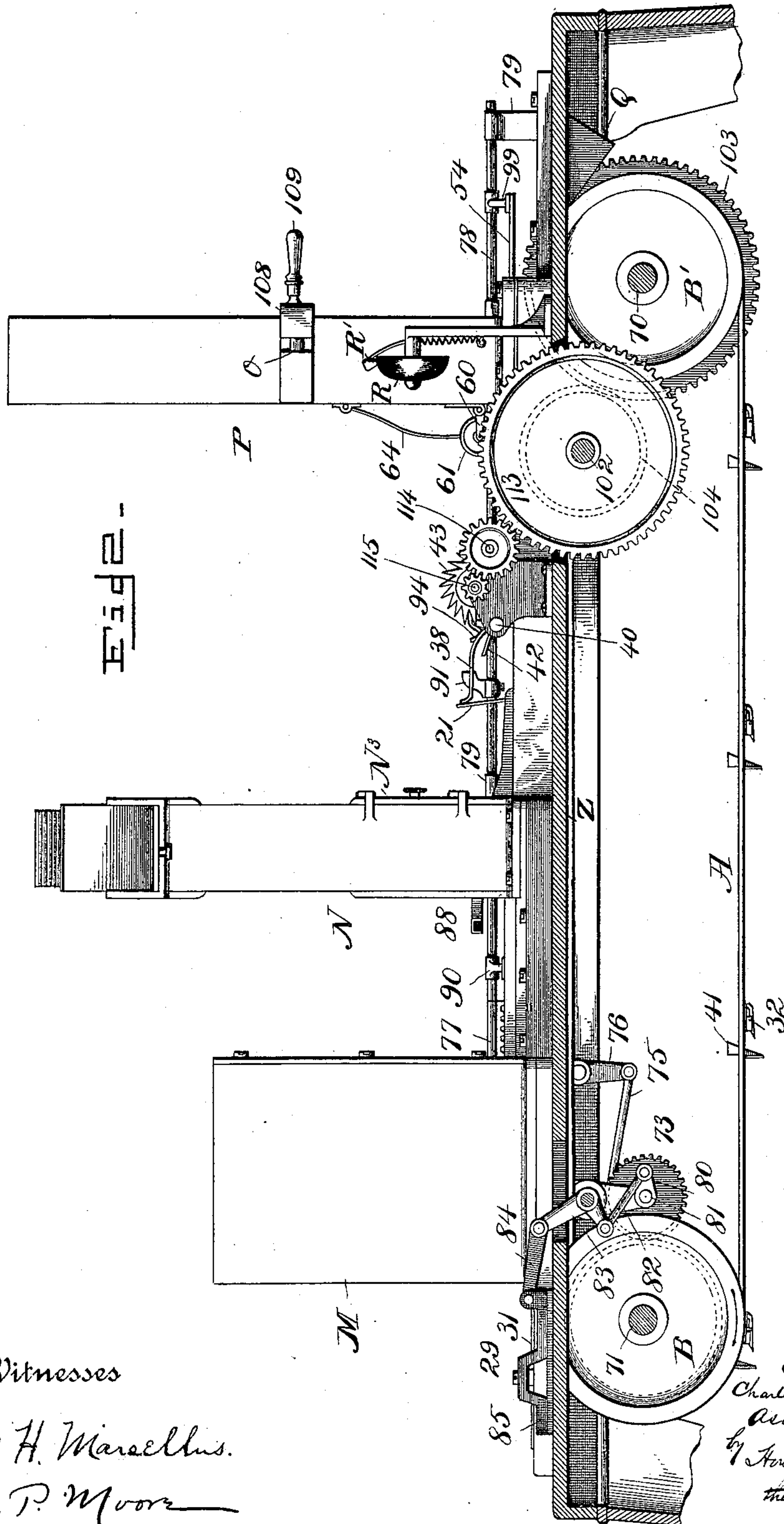
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S. P. Moore

Inventors  
Charles W. Van Vleet  
Ala. Hurd  
By Howard L. Osgood  
their Attorney

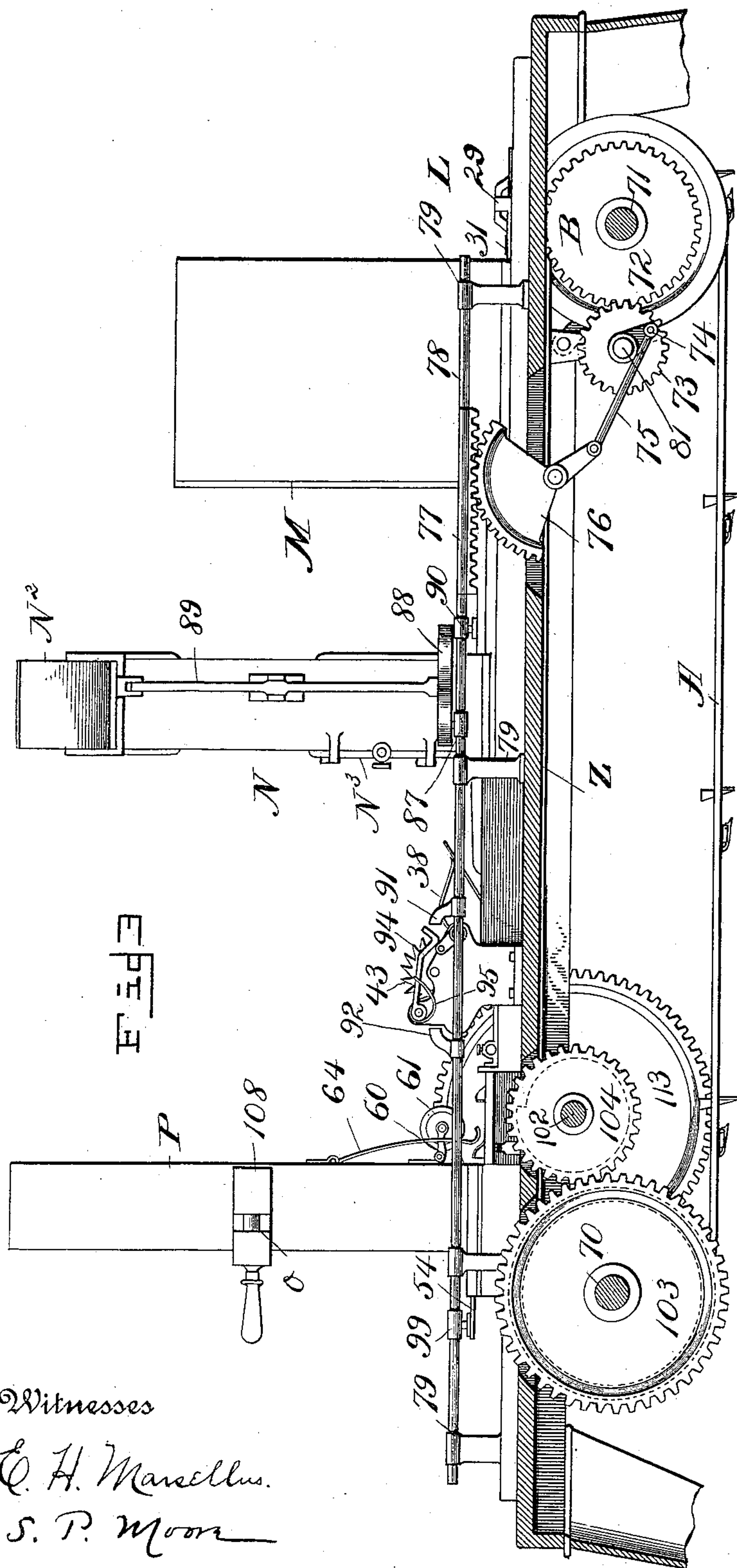
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C. H. Marcellus.  
S. P. Moore

Inventors  
Charles W. Van Vleet  
Ala Hurd  
by Howard L. O'Connell  
their Attorney.



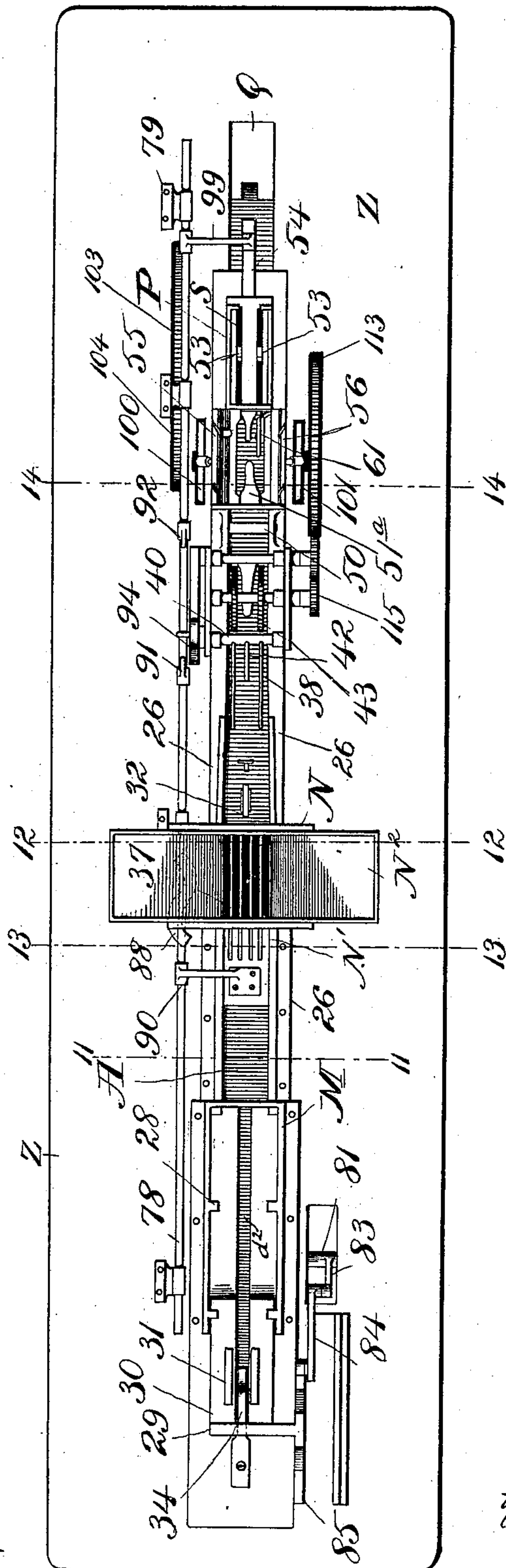
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Witnesses

E. H. Marcellus.

S. P. Moore

Inventors

Charles W. Van Fleet

Asa Hurd

By Howard A. Osborn  
their Attorney:

*their Attorney:*

(No Model.)

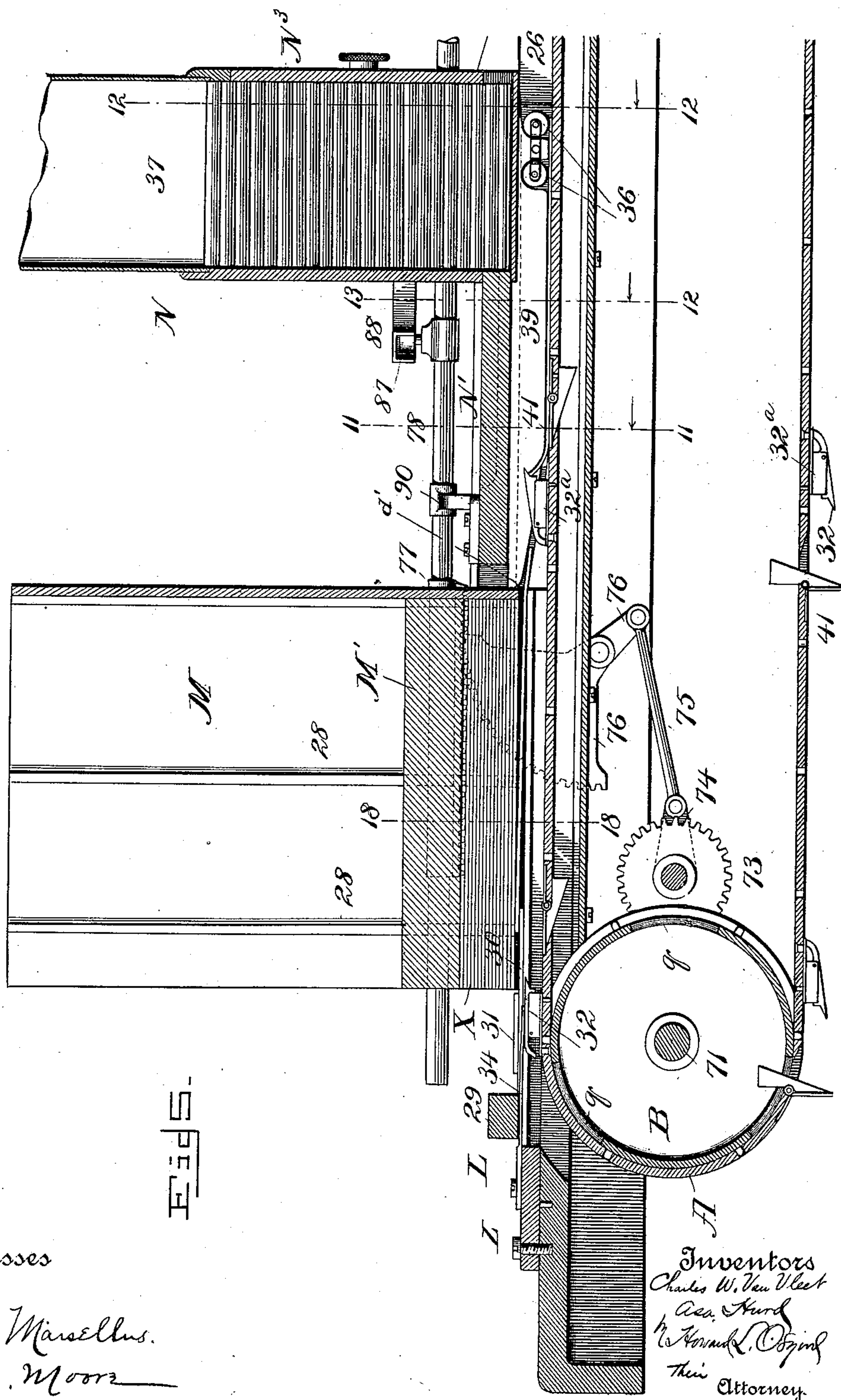
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Witnesses

E. H. Marsellus.

S. P. Moore

Inventors  
Charles W. Van Vleet  
Ass. Surg  
to Komack, Osgood  
Their  
Attorney.



(No Model.)

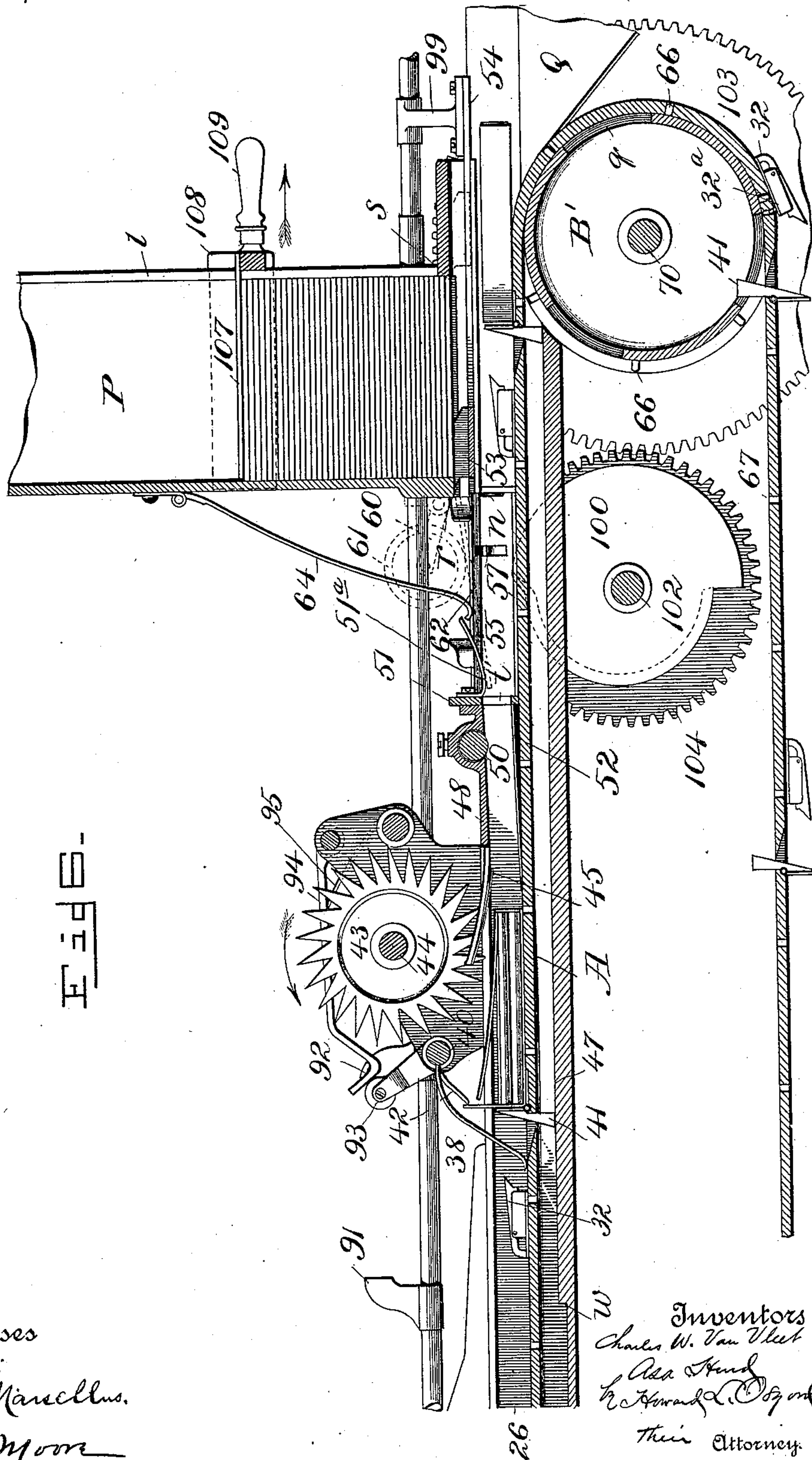
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Witnesses

E. H. Mansellus.

S. P. Moore

Inventors  
Charles W. Van Vleet  
A. H. Hurd  
By Howard L. Osgood  
Their Attorney.

(No Model.)

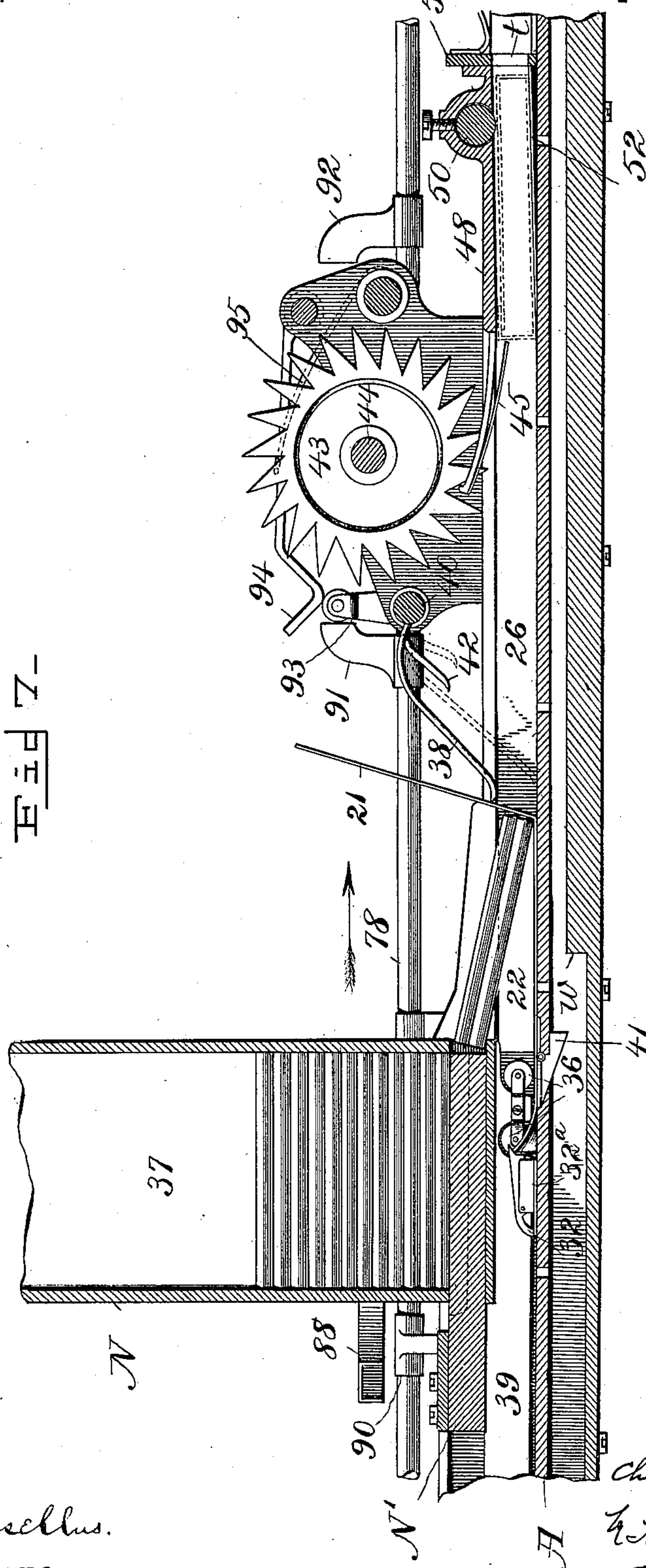
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Witnesses

E. H. Marshall.  
S. P. Moore

Inventors  
Charles W. Van Fleet  
Asa Smith  
& Howard C. Ogden  
Their Attorneys



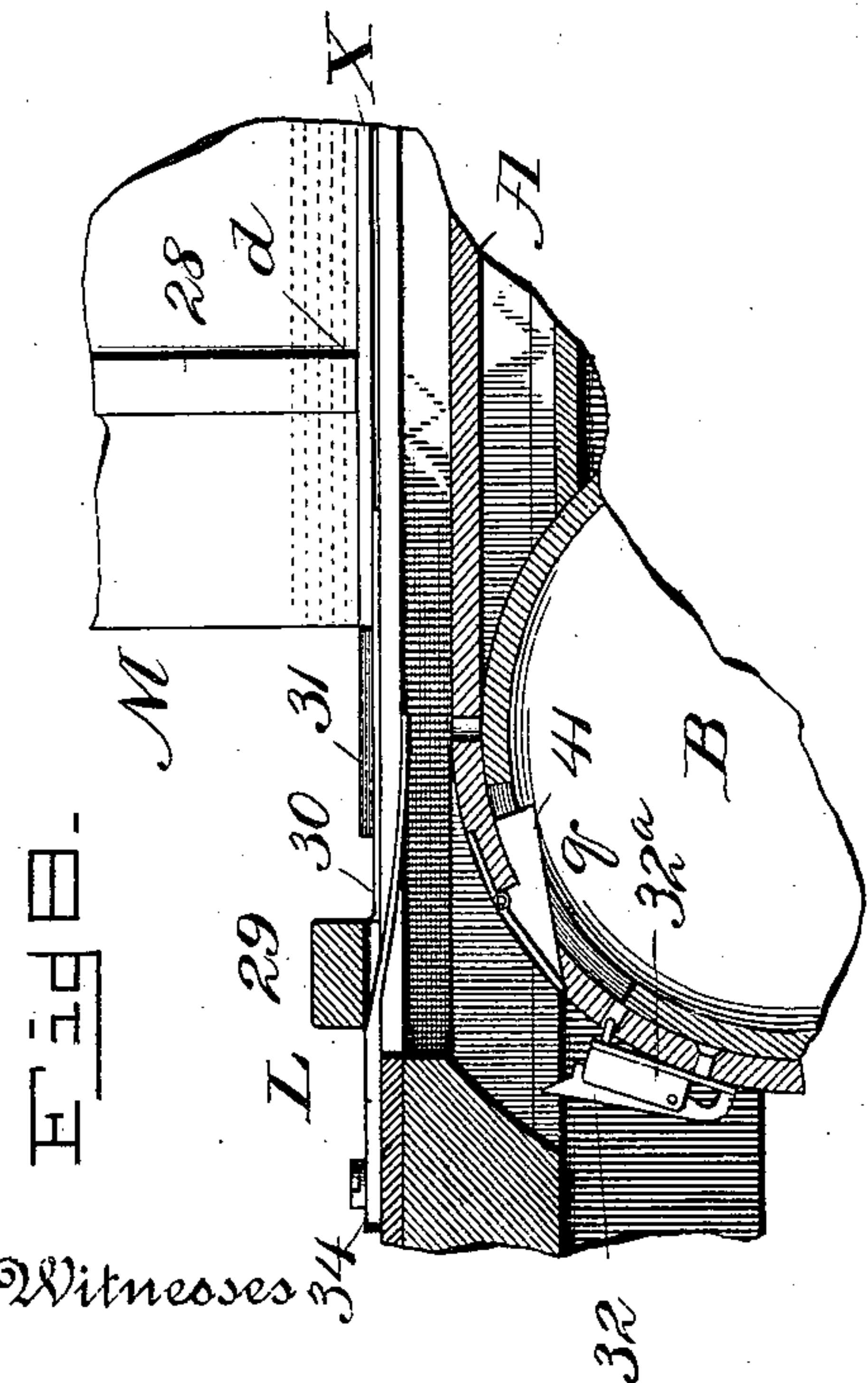
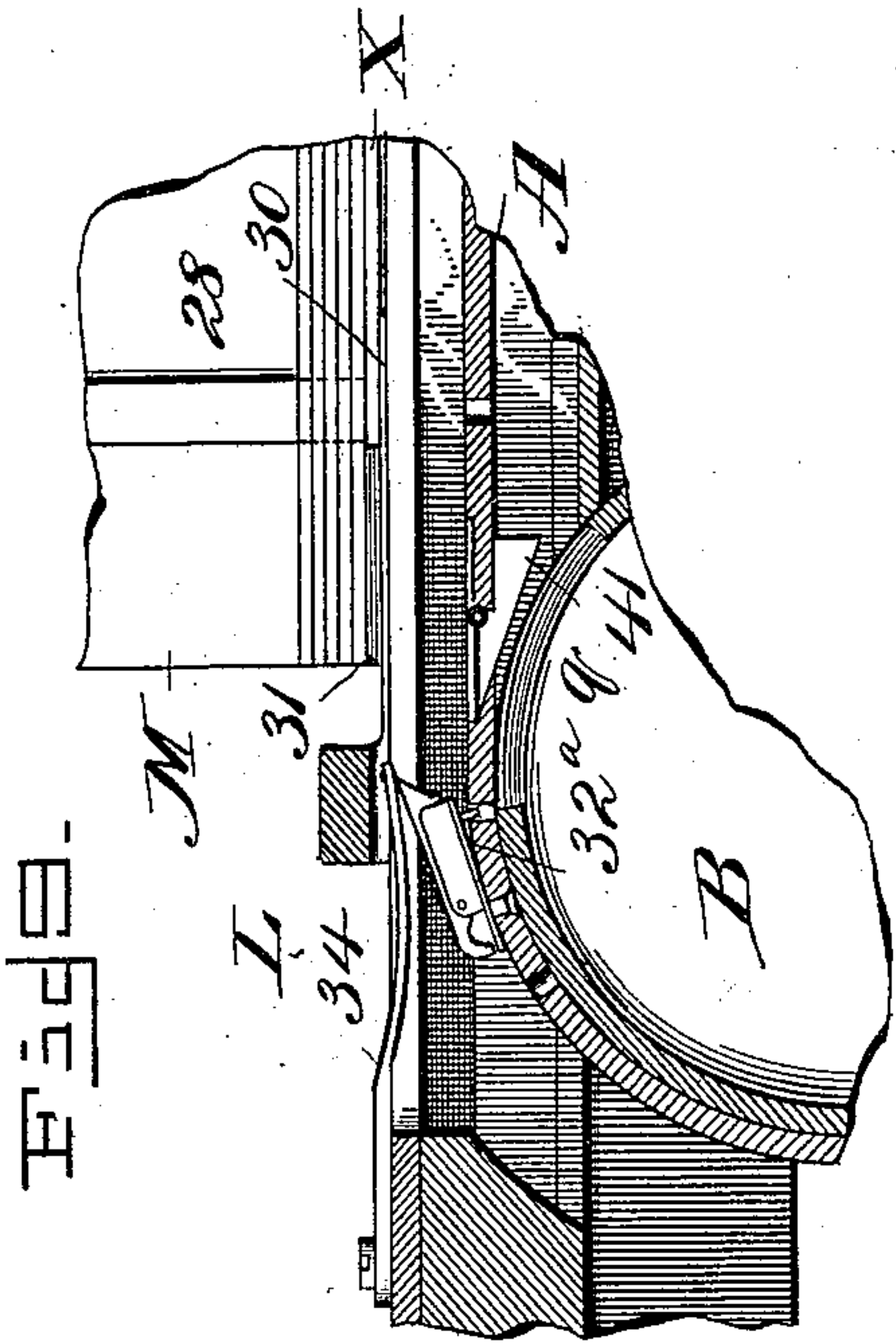
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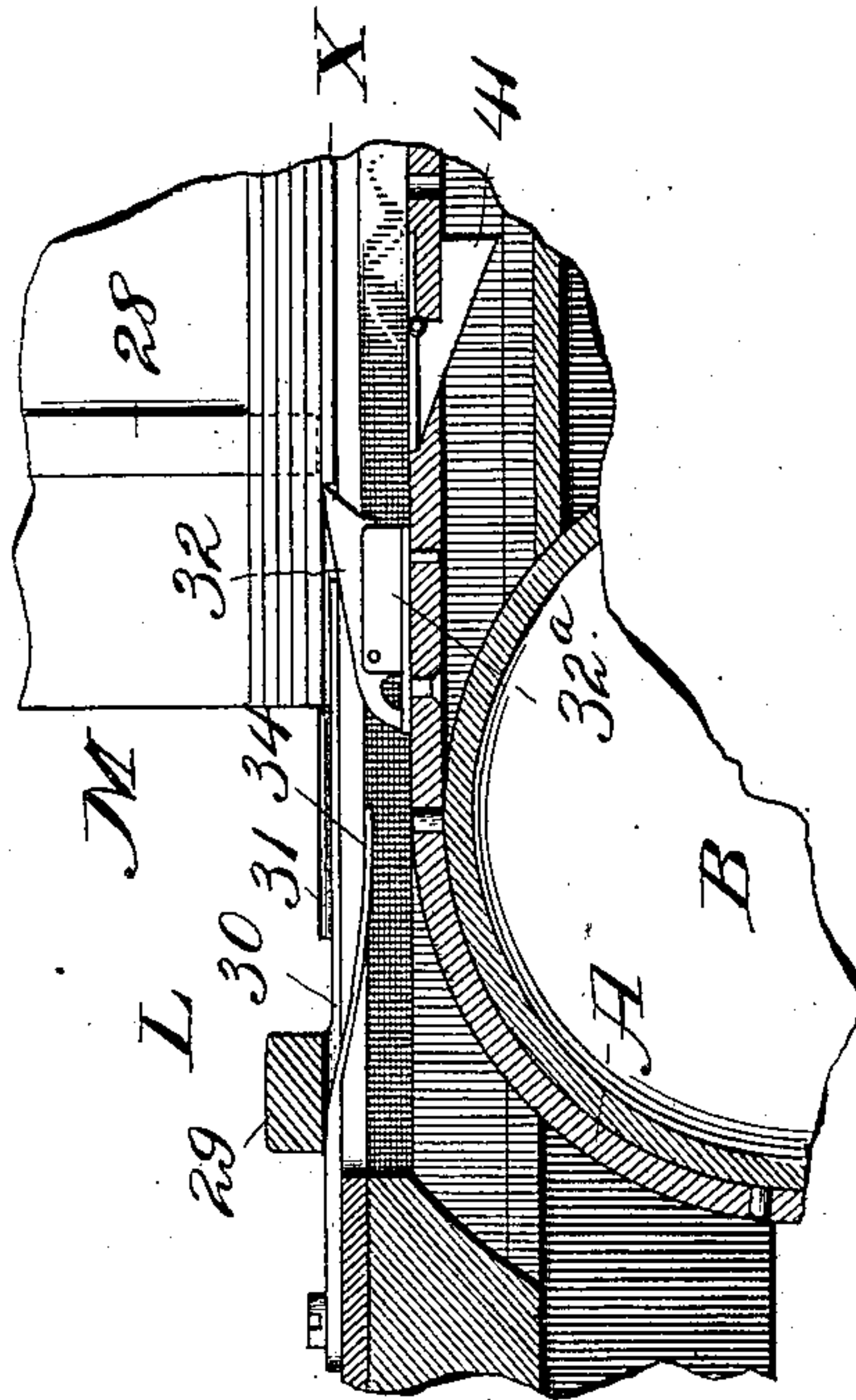
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E. H. Mansellus.  
S. P. Moore

Fig. 10.



Inventors  
Charles W. Van Vleet  
Ala Hurd  
by Howard L. Osgood  
Their Attorney.



(No Model.)

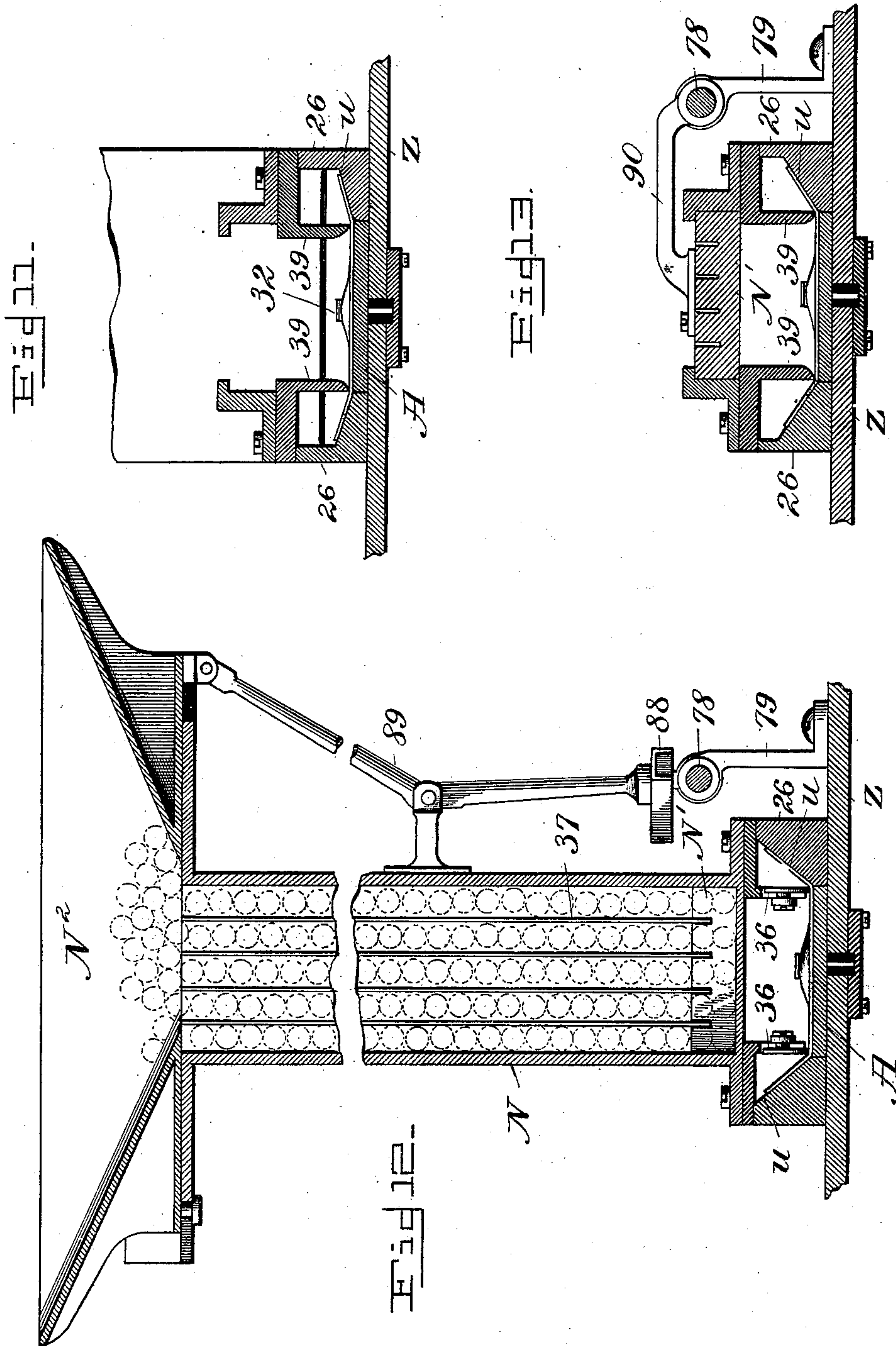
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Witnesses

C. H. Marshall.  
S. P. Moore

Inventors  
Charles W. Van Vleet  
Asa Hurd  
& Howard L. O'Gara  
Their Attorneys

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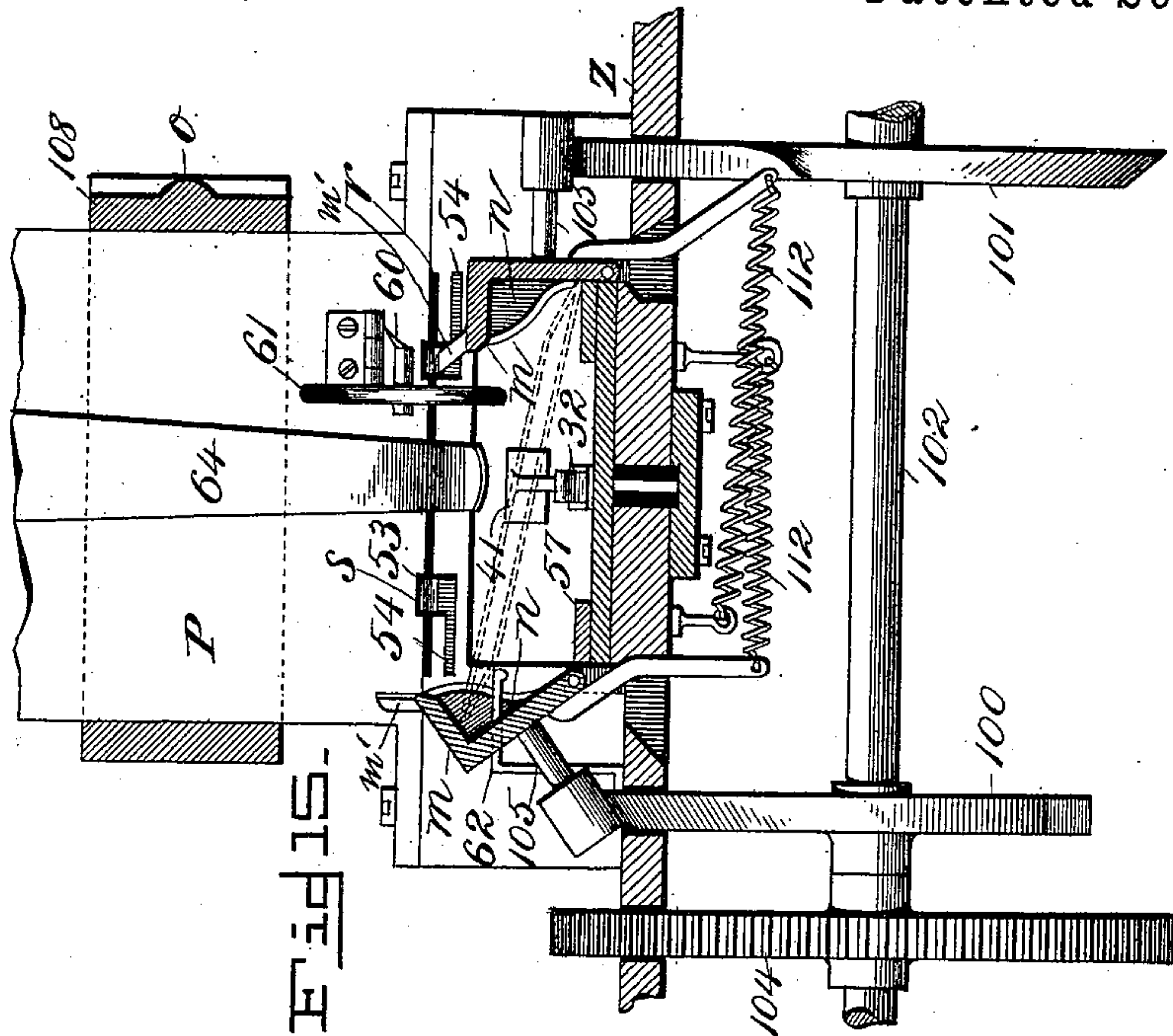


Fig. 15.

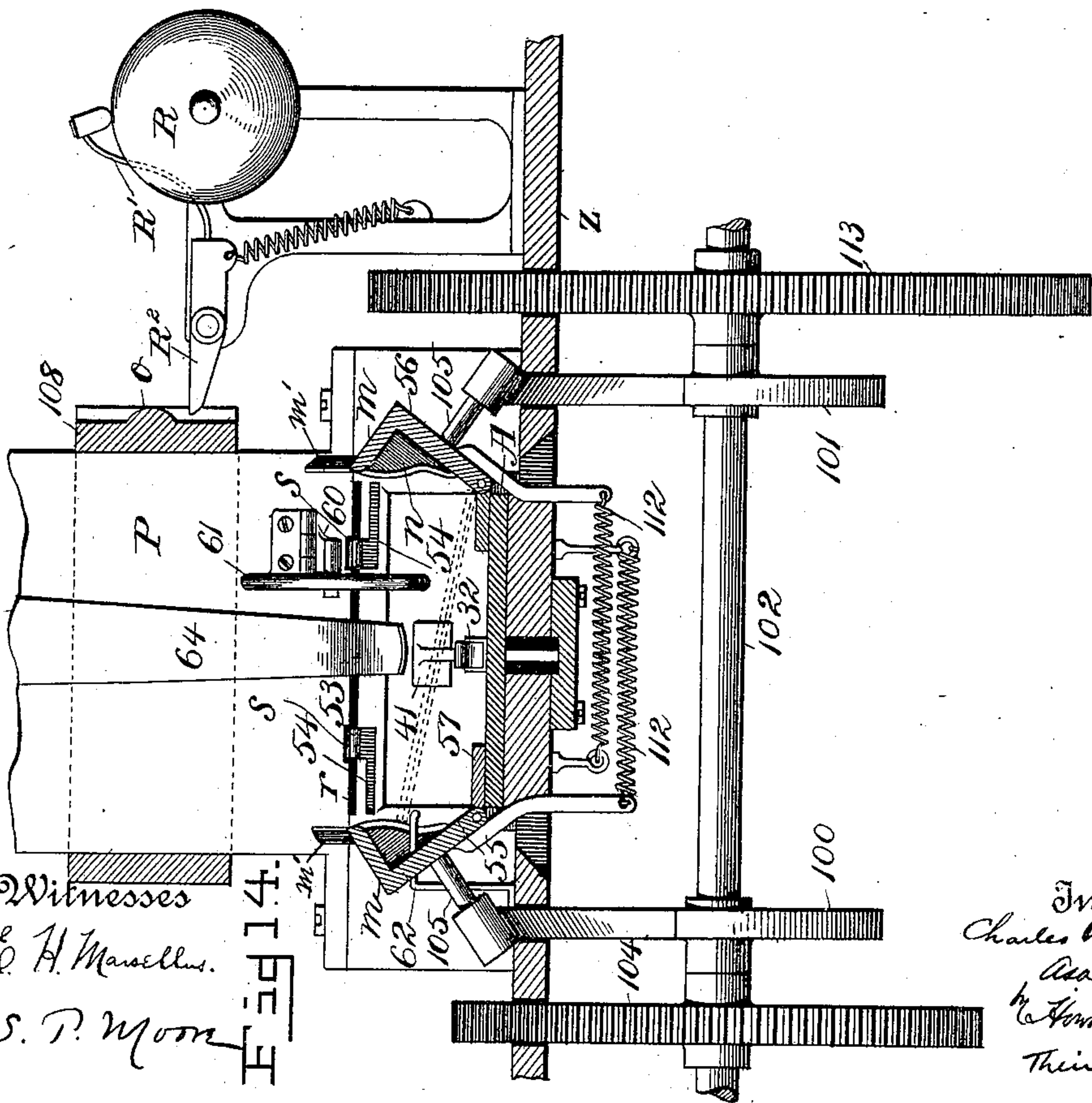


Fig. 14.

Witnesses  
C. H. Mansell.  
S. P. Morn

Inventors  
Charles W. Van Vleet  
Asa Hurd  
By Edward C. O'Connell  
Their Attorney.



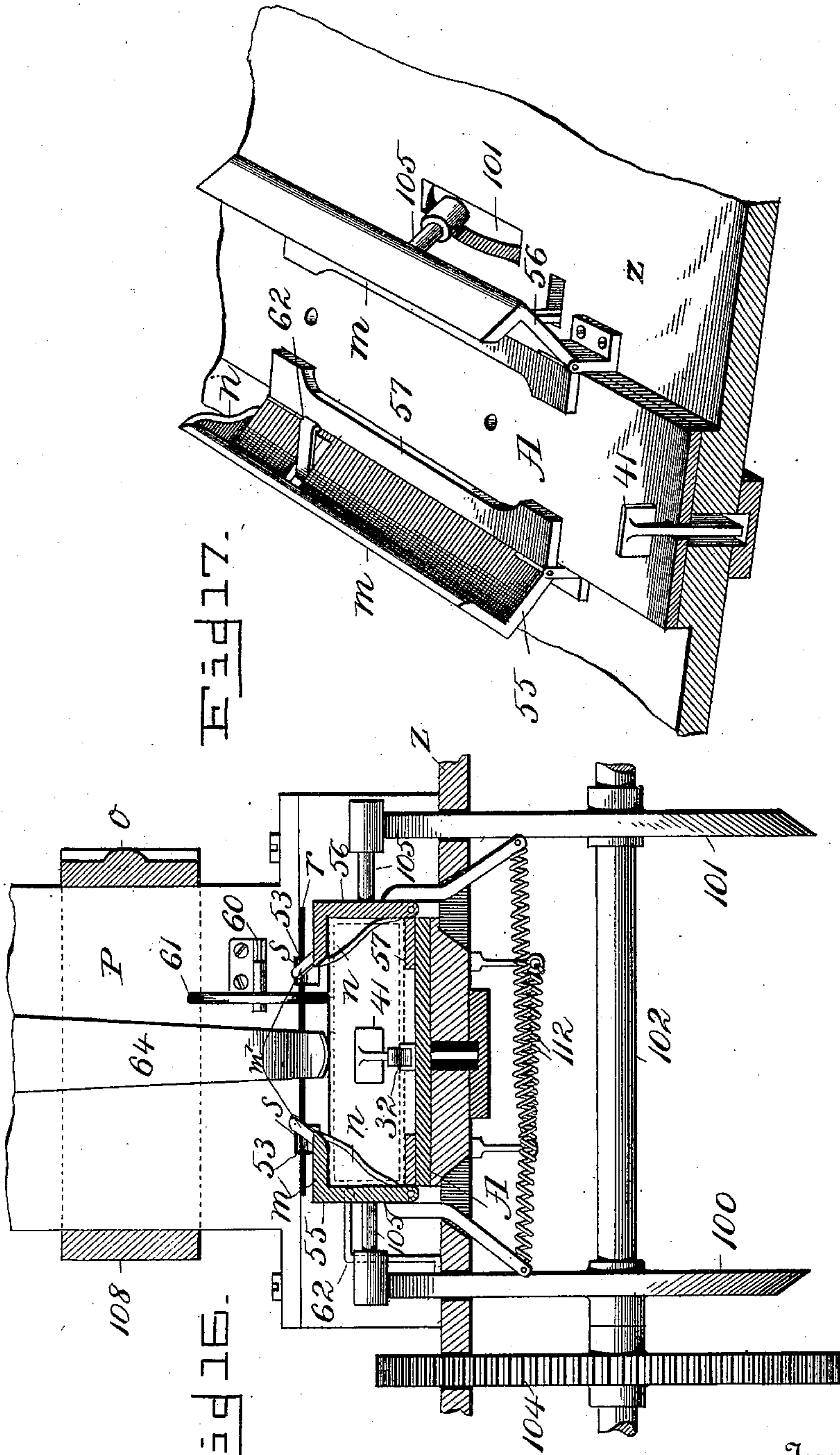
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their Attorney.

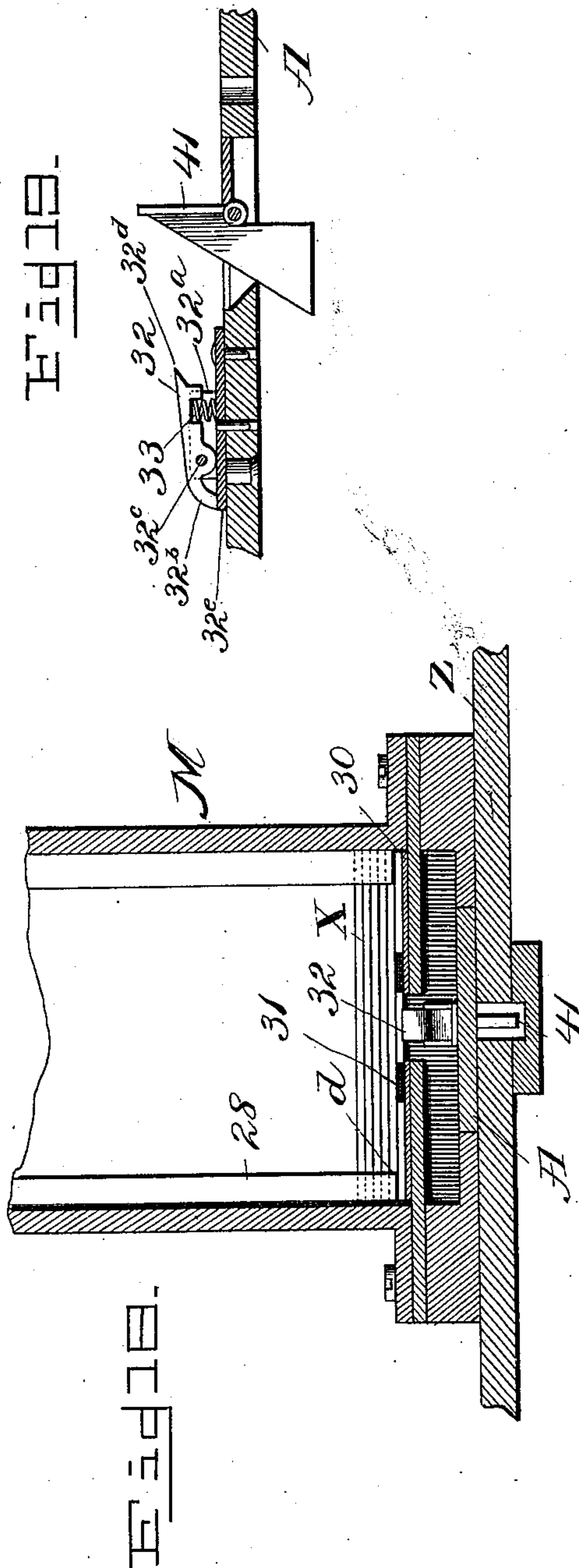
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S. P. Moore

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Charles W. Van Vleet  
Asa Hurd  
by Howard L. Ogden  
their Attorney.



# UNITED STATES PATENT OFFICE.

CHARLES W. VAN VLEET, OF ROCHESTER, AND ASA HURD, OF YONKERS,  
NEW YORK, ASSIGNORS TO SAID VAN VLEET AND JAMES P. OSBORNE,  
OF ROCHESTER, AND WILLIAM D. BALDWIN, OF YONKERS, NEW YORK.

## CIGARETTE-PACKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,014, dated September 1, 1896.

Application filed December 3, 1895. Serial No. 570,957. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES W. VAN VLEET, of the city of Rochester, in the county of Monroe, and ASA HURD, of the city of Yonkers, in the county of Westchester, State of New York, citizens of the United States, have invented certain new and useful Improvements in Cigarette-Packing Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a diagram illustrating the successive operations of our machine. Figs. 2 and 3 are opposite side elevations thereof, parts of the supporting-table being removed to exhibit construction. Fig. 4 is a top plan view of our machine. Fig. 5 is a vertical longitudinal section through the magazines for box-blanks and for cigarettes. Fig. 6 is a similar section through the devices for folding the flaps of the box-blanks and through the cover-magazine. Fig. 7 is a similar section through the cigarette-magazine and the devices for folding the flaps of the box-blanks. Figs. 8, 9, and 10 are like sections through a portion of the magazine for the box-blanks and neighboring parts, the respective figures showing the parts in different positions. Figs. 11, 12, and 13 are transverse sections on the lines 11 11, 12 12, and 13 13 of Fig. 4. Figs. 14, 15, and 16 are transverse sections on the line 14 14 of Fig. 4, showing the parts in different positions. Fig. 17 is a perspective view of the cover-holder when open. Fig. 18 is a transverse section on the line 18 18 of Fig. 5, the weight M' being omitted; and Fig. 19 is a detail view of a picker and a folder, parts being removed to show construction.

Before describing the details of the improved mechanism reference is made to Fig. 1, as illustrating the successive operations by which the box and cover blanks are brought into proper shape. The cigarettes or other articles are deposited properly in the box, and the properly filled and folded box is introduced into the cover. Each box-blank for packing cigarettes consists of a strip of light board or of paper of the form shown at C, Fig. 1, with two tongues 20 21 and two side

wings 22, and is scored or indented on lines indicated by the dotted lines, and the cover-blank Y is a section of a rectangular tube formed from a continuous strip of board or paper having top and bottom pieces 23 24 and side pieces 25, and is capable of being folded down flat, as shown at I, Fig. 1. The box-blanks X are placed successively upon a traveling belt A, which passes around pulleys B B', conducting each box-blank continuously in one line of movement during all the operations upon the same until the filled and covered box is discharged from the machine, thus avoiding the objections incident to stoppages, reversals, or changes of movement. The successive operations upon the box-blank are indicated in Fig. 1 at C, D, E, F, G, H, K, and L. As shown at C, the blank lies flat upon the conveyer-belt A. At D the sides 22 of the blank are turned up and the cigarettes or other articles are deposited upon the blank between the sides. At E the flap 21 of the blank is brought to a vertical position. At F the flap 21 is bent upon a scored line  $x$  down to a horizontal position. At G the flap 20 is brought to a vertical position. At H the flap 20 is bent upon a scored line  $z$  downward upon the flap 21. During these operations upon the box-blank the cover-blank Y (which was originally in the flat position shown at I) is carried toward the belt A and is first brought into the path of the closed box, is then opened, as shown at K, and is then held stationary while the box is passed into the said cover, as shown at L. Then the filled and completed package is carried to the end of the machine and is discharged into a suitable receptacle. The band A, with its supporting-pulleys, is arranged so that the band lies and travels upon the upper face of a table Z, which supports all of the various operating parts. Near one end of the table is the magazine M, adapted to contain the box-blanks X. Near the opposite end is the magazine P, adapted to contain the cover-blanks Y, and between these two magazines is the magazine N, in which are deposited the cigarettes or other filling material to be packed. All of these magazines are in line above the traveling



belt, which passes between side guides 26 upon the table.

*The Box-Blank and Delivery Mechanism.*

5 The magazine M is properly shaped to receive a pile of the blanks X, and has two internal vertical ribs 28, which bear against the ends of the side wings 22 of the blank. These ribs extend downward almost to the bottom  
10 of the magazine, but terminate at a point  $d$ , Fig. 18, far enough above the top of the belt to permit one blank to pass beneath. This prevents more than one blank from being pushed forward at a time by the feeding mechanism. The wall of the magazine has a slot  
15  $d'$ , Fig. 5, for egress of one blank, and the bottom of the magazine has a longitudinal slot  $d^2$  for the passage of the pickers 32, hereinafter described.

20 It has been found that if it is attempted to move forward the lower blank by means of projections upon the belt A such projections may sometimes engage more than one blank if the blanks vary considerably in thickness,  
25 as is sometimes the case, the result being that the blanks are jammed in the egress-orifice and the operations of the machine are interfered with. To avoid the possibility of such action, each blank is fed forward by two  
30 movements imparted by independent devices. Thus the first forward movement of the lowest blank is imparted by a reciprocating pusher L, Fig. 5, which pusher consists of a cross-head 29, from which extend two blades 30 30,  
35 extending under the pile of blanks and having lugs 31 31, the ends of which lugs engage the end of the flap 20 of the blank X when the pusher moves forward. The forward movement of the pusher carries the lowest  
40 blank a short distance, say about three-quarters of an inch, in the direction of the movement of the belt, and then the pusher returns to its first position. (Shown in Fig. 5.) Then  
45 a picker 32, pivoted to the belt A, is brought into position with its end bearing and sliding against the under surface of the lowermost of the blanks above it, as shown in Fig. 10,  
50 and as the picker is carried forward the said end engages the end of the box-blank which has been started by the pusher and carries the blank onward with the belt.

The belt is provided with a suitable number of pickers 32, and these may be constructed in any desired manner; but it is  
55 preferable to pivot each picker between side lugs 32<sup>a</sup>, as best shown in Fig. 19, with a spring 33 for lifting the edge 32<sup>d</sup> of the picker, and in order to prevent this edge from springing upward before the lowest blank is carried  
60 forward by the pusher L a guide or spring 34 is employed, which extends beneath the cross-head 29 and between the blades 30 in position to bear upon the edge of each picker and to hold it down, as shown in Figs. 5 and 9,  
65 until the picker is in position to engage the end of the blank that has been moved forward by the pusher. (See Fig. 10.) The heel

32<sup>b</sup> of the picker is on the opposite side of the pivot 32<sup>c</sup> from the edge 32<sup>d</sup>, and the heel is bent downward, so as to strike against the  
70 supporting-plate 32<sup>e</sup>, and thus limit the upward movement of the edge 32<sup>d</sup> under the operation of the spring 33. (See Fig. 19.) By thus moving the lowest blank a certain  
75 extent forward before the picker can come in contact with it all possibility of the picker engaging more than one blank is absolutely prevented.

Each of the side guides 26 beyond the hopper M is formed with an inclined face  $u$ , Figs. 80 11 to 13, which face  $u$  gradually approaches a vertical position at a point just beyond the hopper N, and overhanging each side guide is a plate with a pendent flange 39, (see Figs. 85 11 and 13,) the lower edge of which is in position to define the line already scored, as shown at C, Fig. 1, upon which the wings shall be bent upward, and to prevent buckling or bending of the blank except on that line; and beneath the hopper N these flanges  
90 39 support two vertical wheels 36, (see Figs. 7 and 12,) which serve the same purpose as the flanges and reduce friction at the point where the flanges are bent nearly to their vertical position and form sharp bends. It will  
95 be understood that the pickers 32 are arranged upon the belt A at such a distance apart that the successive blanks will lie upon the belt separated only by the distance necessary to receive the intermediate pickers and folders,  
100 although this distance may of course be increased, if occasion requires. The supporting-plate of each picker is fastened to the belt at one point only, and guide-pins fixed to the plate enter holes in the belt to prevent  
105 displacement of the plate. This arrangement is provided in order to permit the pickers to pass around the pulleys B and B'. (See Figs. 6, 8, 9, and 10.)

*Cigarette Holding and Delivery Mechanism.* 110

When the device is used for packing cigarettes, the magazine N is divided by partitions 37 (see Fig. 12) into as many channels as  
115 there are cigarettes in the width of the box. Thus, if there are five cigarettes across the width of the box, there will be four partitions 37, forming five separate channels. Combined with the magazine is the feeding-plunger N', which in the form shown is brought  
120 opposite the ends of the two lowest series of cigarettes and moves forward in the same direction as the belt, forcing such two series from the magazine first into position above the  
125 blank and then entirely away from the magazine when they fall upon the blank, as shown in Fig. 7. If only the lowest row of cigarettes is to be discharged, the feeding-plunger is equal in thickness to said series; but if  
130 two or more series of cigarettes are to be simultaneously discharged the plunger is made of proportionate thickness. As shown, it is equal to the thickness of two series of cigarettes, so that two series or layers are dis-



charged at one time, and there are thus carried to the blank ten cigarettes in two rows of five each, which fall into position between the upturned wings or sides 22. Where the cigarettes vary somewhat in diameter, it is best to make the thickness of the plunger a little less than the thickness of the mass of cigarettes to be discharged, in order to prevent the plunger from engaging any cigarettes in a layer or series which should be left in the magazine.

The feeding-plunger N' reciprocates once to the passage of each blank, so as to feed a charge of cigarettes to each of the blanks in succession. Above the magazine N is a tray N<sup>2</sup>, having sides converging toward the top of the magazine, and into which the cigarettes are delivered by the operator as fast as the same are needed; and in order to insure their uniform delivery to the different channels in the magazine and to avoid constant attention upon the part of the operator to prevent any channel from failing to keep full the tray is reciprocated across the top of the magazine at the rate of one or two reciprocations a second.

As a broken or bent cigarette may accidentally get in one of the channels and become jammed therein, one of the sides of the magazine N is provided with a hinged door N<sup>3</sup>, Figs. 2, 3, and 5, which may be thrown open to afford ready access to all the channels inside the magazine.

#### *The Flap-Bending Mechanism.*

The mechanism for folding the end flaps of the box-blank is arranged between the cigarette-magazine N and the cover-magazine P and comprises two sets of devices, one for folding the long flap 21 and the other for folding the short flap 20.

The devices for folding the long flap 21 consist of folders or fingers 38, extending from a rock-shaft 40 forward and downward until they meet the belt A in position to pass beneath the advancing end of the flap 21, as shown in Fig. 6 and in dotted lines, Fig. 7. Normally the ends of these fingers rest upon the belt, as shown in Fig. 6, but just prior to the depositing of the cigarettes in the blank the fingers 38 rise to the position shown in Fig. 7 as the shaft 40 rocks, bending the flap 21 nearly at right angles to the bottom of the blank. As the blank travels farther forward the shaft 40 continues to rock until the fingers 38 reach the position shown in Fig. 2, and they then begin to descend, bending the flap 21 on the line *x*, Fig. 1, and pressing the flap down in a horizontal position until the box passes from beneath the fingers 38. About at the time the box escapes from beneath the fingers 38 the devices begin to act for turning the flap 20 upward and inward. These devices consist of a folder 41, pivoted about midway of the length in a slot of the belt A, and two ratchet-like wheels 43 upon a shaft 44, rotating in the direction of the arrow, Fig. 6.

The folder 41 normally occupies a position parallel to the belt, as shown in Fig. 5, but just as the arms 38 bring the flap 21 to a flat position on top of the cigarettes the forward end of the folder 41 meets a shoulder *w* upon the frame, so that as the belt travels the folder is turned up to the vertical position shown in Fig. 6, carrying the flap 20 to a vertical position. To prevent the flap by any possibility from being folded under the flap 21, the shaft 40 is provided with an arm 42, so arranged that as the flap 20 is brought to a vertical position it will be brought against the end of the arm 42, which prevents it from being bent forward and beneath the flap 20, but on the contrary will cause it to bend backward slightly, while the box is carried forward and the flap 20 passes beneath the arm 42.

As the box travels farther forward the flap 21 is held down by the ends of the teeth of the wheels 43. At the same time the upper projecting portion of the flap 20 is carried to the wheels 43 and enters the deep space between two of the teeth of each wheel, and the revolution of the wheel bends this flap on the line *z*, Fig. 1, and folds its end flat upon the end of the flap 21. The continued rotation of the wheels carries the teeth rapidly over the portion of the tongue 20, now folded down, and both flaps are held in position until they respectively pass beneath a projecting spring 45, which extends inward between the wheels and presses upon the top of the box. It will be understood that the wheels 43 revolve very rapidly and that the downward folding of the end of the flap 21 is instantaneous, the operation being effected with absolute certainty and without tearing or breaking the flap in any manner. It is evident that as soon as the end of the flap is turned up and away from the picker 32 the latter ceases to act to push and carry the box with the belt and that, as the folder 41 at once assumes a vertical position, it constitutes a solid abutment for the box, insuring its travel with the belt. In order to maintain this vertical position of the folder, it is provided with a square end, and the frame of the machine is provided with a rail 47, upon which said end travels, as shown in Fig. 6, thereby preventing the folder from turning down until it escapes from the end of said rail.

The spring 45 is carried by the projecting arm of a cover-plate 48, which is provided with a recess to receive an antifriction-roller 50, which bears upon the top of the box as the latter is carried forward and beneath the plate and toward the opening *t* in a transverse plate 51 and over two separated thin plates 52, which extend from the lower edge of the said opening back over the belt. The plates 52 lift the box slightly, so that its forward end is carried above the belt to an extent sufficient to allow that end to enter the end of the cover Y, Fig. 1, as hereinafter described, the opening in the plate 51 being of such a size as to hold the box in its rectangular shape and most com-



compact dimensions as it passes from the opening toward the opened cover Y, as shown in Fig. 7. The roller 50 compresses the box slightly to enable it the more easily to enter the opening  $t'$ .

#### *The Cover Holding and Opening Mechanism.*

A series of the cover-blanks, folded down flat, as shown at 1, Fig. 1, are arranged one above the other in a magazine P. This magazine has a bottom with two longitudinal slots  $s$   $s$ , into which project lugs 53 upon a reciprocating slide 54, which slides longitudinally beneath the magazine, carrying the lugs 53 forward to a position opposite the edge of the lowest blank, as shown in dotted lines, Fig. 6, after which they move in the opposite direction, come in contact with the ends of the lowest blank, and force the latter backward to a transverse slot  $r$  in the wall of the magazine. The box-cover blank is thus discharged from the magazine and falls by gravity into the space, between the magazine and the wheels 43, which contains the cover-opening mechanism. This mechanism is of such a character as to press laterally against one of the folded edges of the flattened rectangular tubular cover-blank, and thereby this mechanism opens the blank to form an open-end tube and holds it in a position in the path of motion of the box in order to receive the box.

The opening mechanism consists of two hinged jaws 55 56, each hinged at its lower end adjacent to a plate 57, which extends over the belt A, and each jaw has an upper flange  $m$  at right angles to the side of the jaw and a web  $n$  at the forward end. It is very important that each blank as it is discharged into the opening mechanism shall pass between the jaws in their opened position, that one edge of the blank shall descend to its lowest extent upon the plate 57 adjacent to the jaw 56, and that the other edge of the blank shall occupy its highest position adjacent to the flange  $m$  of the jaw 55. (See dotted lines in Figs. 14 and 15.) To insure the blank taking this position when the jaws are opened, an arm 60, carrying a vertical presser-wheel 61, is hinged to the forward wall of the magazine P in such position that as the blank passes beneath the wheel 61 the edge or side adjacent to the jaw 56 will be thrown downward, while the opposite side will be arrested by the horizontal arm of a bracket 62, bolted stationary to the frame of the machine and extending through a slot in the jaw 55. The cover-blank is thus discharged into the opening mechanism and held between the jaws in the inclined position shown in dotted lines, Fig. 14, and in order to guide the blank as it falls and to prevent the blank from slipping during subsequent operations it is pressed down by the end of a spring-arm 64, pivoted to the forward wall of the magazine P, (see Fig. 6,) the said arm, however, yielding to accommodate itself to the movements of the blank. A leaf-

spring 51<sup>a</sup>, Figs. 4 and 6, may be attached to the plate 51 between the jaws 55 56 to assist in guiding the cover Y into position to register with the orifice  $t'$ .

The blank being in the position shown in dotted lines, Fig. 14, the jaw 56 is swung inward, as shown in Fig. 15, thereby forcing the blank laterally until its opposite edge is in the corner formed by the side and flange  $m$  of the jaw 55, after which the latter swings inward to the position shown in Fig. 16. As the jaw 55 moves inward the pressure on the edge of the blank causes it to gradually open until, when the jaw 55 is fully closed, the blank is fully opened and is held in its rectangular opened form between the jaws upon the plates 57 and directly opposite the opening  $t$  in the plate 51, through which the filled box passes into the cover, the latter being held stationary as the box passes inward by the contact of its end with the webs  $n$   $n$ . Guide-wings  $m'$ , Figs. 14, 15, and 16, may be fixed upon the flanges  $n$  of the jaws 55 56 to assist in guiding the cover Y from the magazine into the cover-holder. It will of course be understood that there is no interruption to the travel of the box, which from the time the blank X begins to move with the belt until the covered box is discharged moves continuously forward without interruption and at the same rate of speed. As soon as the box is fully within the cover the jaws fall apart to the position shown in Fig. 14, removing the webs  $n$   $n$  from opposite the end of the cover, when the covered box is carried forward beneath the magazine P and over the pulley B' and into the end of a chute Q, which conducts it to any suitable receptacle. It will of course be understood that there is a folder 41 adjacent to each of the pickers 32, and in order that these folders may occupy their proper positions as the belt passes around the pulleys B B' the latter are provided with recesses  $q$ , into which the ends of the folders pass. It is necessary that the belt shall always occupy a definite position in relation to the pulleys and that there shall be no slip thereon, and therefore the pulleys are provided with pins or projections 66, (see Fig. 6,) which enter corresponding openings in the belt.

The parts above described may be combined with any suitable kind of mechanism for imparting the desired movements at the proper speed and intervals. Mechanism which has proved to be effective for moving the different parts will now be described.

The main driving-shaft 70 carries the pulley B', the other pulley B being driven through the medium of the belt A. The shaft 71 of the pulley B carries a gear 72, which drives a pinion 73, having a crank-arm 74, connected by a rod 75 with the arm of a toothed sector 76, pivoted to a pin upon the frame and engaging a rack 77 upon a rod 78, sliding in standards 79 upon the frame. Another crank-arm 80 upon the shaft 81 of the pinion 73,



Fig. 2, is connected by a rod 82 with a crank-lever 83, connected by a link 84 with a slide 85, that carries the cross-head 29.

The rotation of the wheel B serves, through the mechanism described, to impart the proper reciprocating motion to the cross-head 29.

The reciprocation of the rod 78 serves to operate different parts of the mechanism. Thus a pin 87 upon the rod enters a waved groove in a cam 88 upon a lever 89, pivoted at one side to the magazine N and connected to the tray N<sup>2</sup>, and thus the lever 89 is vibrated and the tray is reciprocated by the sliding movement of the rod 78. The rod 78 is also connected by an arm 90, Fig. 13, with the feeding-plunger N' and reciprocates the latter. The rod 78 aids also in imparting a rocking motion to the shaft 40. Thus the rod 78 carries two separated arms 91 92, which are alternately brought in contact with an antifriction-roller at the end of an arm 93 on the shaft 40. (See Figs. 6 and 7.) The arm 91, moving in the direction of the arrow, Fig. 7, carries the arm 93 to a position beyond the point of a V-shaped projection upon an arm 94, which is normally drawn downward by a spring 95, (shown in Figs. 3 and 7,) lifting the said spring and putting it under tension, so that as the arm 93 escapes the said point the descent of the arm 94 forces the arm 93 farther to the right to rock the shaft sufficiently to carry the arms 38 to their upper position. (Shown in dotted lines.) When the rod 78 is carried in the reverse direction, the arm 92 comes in contact with the arm 93 and swings the latter and rocks the shaft 40 to carry the arms 38 to their lowest position. (See Fig. 6.) An arm 99 extends from the rod 78 to the plunger 54 of the cover-magazine and serves to reciprocate that plunger.

The wheels 43 are driven from the shaft 70 through a series of gears 103, 104, 113, 114, and 115, as illustrated in Figs. 2, 3, and 4.

The jaws 55 and 56 are operated by two cams 100 101 upon a shaft 102, driven by the gears 103 and 104 from the shaft 70. Each of the said cams bears against a roller upon an arm 105, extending from the adjacent jaw, the cams being of such shape as to close first one jaw and then the other and then to open both jaws simultaneously and quickly as soon as the box is fully within the cover. The forms of these cams 100 101 are illustrated in Figs. 6, 14, 15, and 16.

It is important to press the blanks downward in the magazines M and P and to keep them perfectly flat and contiguous. For this purpose a weight M', Fig. 5, is placed upon the column of blanks in the magazine M and a weight 108 is provided for the magazine P.

Inasmuch as the cover-blanks are thicker than the box-blanks, the capacity of the magazine P, as to the number of blanks it will hold, is much less than that of the magazine N, and it is therefore desirable to frequently renew the contents of the magazine P during the operations of the machine. As

it would interfere with the operations and lead to imperfect feeding of the cover-blanks to remove the pressure of the weight in order to supply a new mass of blanks, provision is made to maintain this pressure at all times. To this end the rear wall of the magazine is provided with a vertical slot L, (see Fig. 6,) into which extends a blade 107, fixed to the weight 108, which last is in the form of a yoke or fork embracing the outside of the magazine in order to be balanced, and is provided with a handle 109. The weight descends as the blanks in the magazine decrease in number. When it becomes necessary to supply another mass of blanks, they are placed in the magazine above the blade 107. The blade of a second weight is then placed upon the additional mass of blanks, (if this mass is not of itself sufficiently heavy,) and the lower weight is removed by drawing it backward in the direction of the arrow, Fig. 6, carrying the blade 107 outward through the slot L.

To attract the operator's attention to the fact that the magazine is nearly exhausted, an alarm is provided, as for, instance, a bell R and hammer R', Figs. 2 and 14, so arranged that a projection o upon the weight 108 comes in contact with the end of the hammer-lever R<sup>2</sup> and sounds the bell whenever the weight reaches a low position. In place of the weight M' similar devices to those just described may be provided for the magazine M.

Where the arms 105 and their rollers are not sufficiently heavy to insure the opening of the jaws, a spring 112 may be connected to arms projecting from the jaws to insure this result.

The respective following claims, including those containing reference letters or numerals, are intended to bear the broadest construction which the actual state of the art permits, and are not to be more narrowly construed than the actual state of the art requires.

What we claim is—

1. The combination of the continuous belt A, the magazine M for box-blanks having a slotted bottom and a slot for egress of a blank, the pusher 30 adapted to press against the end of a blank and to start the same through the slot in the direction of the movement of the belt and then to disengage from said blank, and a series of pickers 32 upon said belt moving through said slotted bottom and adapted to engage the edge of the started blank and to move the same with the belt, substantially as described.

2. The combination of the continuous belt A, means for moving boxes thereon, a magazine N for cigarettes having an orifice over the path of the belt and provided with vertical partitions 37 adapted to separate the cigarettes into vertical columns, the tray N<sup>2</sup> having downwardly-converging sides for delivering cigarettes to said magazine and between said partitions, the lever 89 and waved



cam 88 for reciprocating the said tray transversely to distribute the cigarettes between said partitions, and means, as the plunger N', for discharging cigarettes from said magazine to said boxes, substantially as described.

3. The combination, with a magazine for blanks having an orifice for the egress of a single blank, of a supporting-plate 32<sup>e</sup>, a picker 32 pivoted to said plate and having a forward edge 32<sup>d</sup> adapted to engage a blank and a downwardly-projecting heel 32<sup>b</sup>, a spring 33 tending to raise said edge, moving mechanism carrying said supporting-plate, and the guide 34 to depress said edge and compress said spring, substantially as described.

4. In a packing-machine, the combination of the continuous belt A, the magazine N for a column of flat blanks, means, as pickers 32, for removing blanks therefrom one by one and for moving the blanks successively upon said belt, the magazine N for the filling material and means for delivering successive charges of said material from said magazine to said blanks as they pass the same, means, as converging sides *u* in a channel in which said belt runs, for holding the sides of said blanks, a rod 78 reciprocating longitudinally of said machine, a plunger N' for discharging the charges of filling material from the magazine N to said blanks, connections between said rod and said plunger, devices for finishing the folding said blanks about the charge of material, and connections between said rod and said folding devices whereby the latter are operated, substantially as described.

5. The combination of a magazine for blanks having a vertical slot *l* in a wall thereof, a blade 107 adapted to pass through said slot and to rest upon the mass of blanks, and a weighted yoke 108 embracing said magazine and attached to said blade, whereby the blade presses upon the blanks and is removable from said magazine, substantially as described.

6. The combination of a magazine for blanks having a vertical slot *l* in the wall thereof, a blade 107 adapted to pass through said slot and rest upon the mass of blanks, a weighted yoke 108 embracing said magazine and attached to said blade and having a lug *o* thereon, a bell R, and a hammer-lever R<sup>2</sup> in position to be operated by contact with said lug for striking said bell, substantially as described.

7. In a machine for covering boxes, the combination of a cover-holder, a magazine P for covers adjacent to said holder and above the level thereof, means for discharging one cover at a time from said magazine whereby the cover falls by gravity into the holder and means, as a spring-arm 64, for guiding the cover downward into the cover-holder, substantially as described.

8. The combination, in a packing-machine, of a channel for filled boxes, a box-carrier A for moving a succession of boxes in said chan-

nel, a magazine P for box-covers above said channel and in line therewith, a cover-holder in line with said channel and adjacent to said magazine comprising a pair of opening jaws 55, 56, means for feeding one cover at a time between said jaws when open, and means for closing said jaws to hold said cover while the box is being inserted therein by said box-carrier, substantially as described.

9. The combination, in a packing-machine, of a channel for filled boxes, a box-carrier A for moving a succession of boxes in said channel, a magazine P for box-covers above said channel and in line therewith, a cover-holder in line with said channel and adjacent to said magazine comprising a pair of opening jaws 55, 56, means for feeding one cover at a time between said jaws when open, and means for closing said jaws by moving the same successively to hold said cover while the box is being inserted therein by said box-carrier, substantially as described.

10. The combination, in a packing-machine, of a channel for filled boxes, a box-carrier A for moving a succession of boxes in said channel, a magazine P for box-covers above said channel and in line therewith, a cover-holder in line with said channel and adjacent to said magazine comprising a pair of opening jaws 55, 56, means for holding one edge of the cover up between the jaws, means for pressing the opposite edge of the cover downward between the jaws, and means for closing said jaws to open said cover and to hold the same while the box is being inserted therein by said box-carrier, whereby the jaws in closing press diagonally opposite edges of the cover to press the same into the rectangular form, substantially as described.

11. The combination, in a packing-machine, of a channel for filled boxes, a box-carrier A for moving a succession of boxes in said channel, a magazine P for box-covers above said channel and in line therewith, a cover-holder in line with said channel and adjacent to said magazine comprising a pair of opening jaws 55, 56, means for holding one edge of the cover up within the jaws, means for pressing the opposite edge of the cover downward upon the jaws, and means for closing said jaws successively to hold said cover while the box is being inserted therein by said box-carrier, whereby the jaws in closing press diagonally opposite edges of the cover to press the same into the rectangular form, substantially as described.

12. The combination, in a packing-machine, of a channel for filled boxes, a belt A running in said channel and provided with means for moving a succession of boxes thereon, a magazine P for box-covers above said channel and in line therewith, a cover-holder in line with said channel and adjacent to said magazine comprising a pair of opening jaws 55, 56, means for feeding one cover at a time from said magazine between said jaws when open, and means, as the cams 100, 101, acting upon



said jaws to close the same while the box is being inserted therein by the movement of said belt and then to release the covered box, substantially as described.

5 13. The combination, in a packing-machine, of a channel for filled boxes, a belt A running in said channel and provided with means for moving a succession of boxes thereon, a magazine P for box-covers above said channel and  
10 in line therewith, a cover-holder in line with said channel and adjacent to said magazine comprising a pair of opening jaws 55, 56, means for feeding one cover at a time from said magazine between said jaws when open,  
15 means, as the cams 100, 101, acting upon said jaws to close the same while the box is being inserted therein by the movement of said belt and then to release the covered box, a stationary arm or bracket 62 passing through  
20 one of said jaws and adapted to hold one edge of the cover up within the jaws until the jaws close, a vertically-movable presser-wheel 61 adapted to press the opposite edge of the cover downward within the jaws, whereby  
25 the jaws in closing press diagonally opposite edges of the tubular cover to shape the cover to fit the interior of the jaws, and the webs *n n* upon said jaws for retaining the opened cover therein while the box is being inserted  
30 therein, substantially as described.

14. The combination, in a packing-machine, of a magazine M for box-blanks, means for folding the sides of said blanks to partially form boxes, a magazine N for cigarettes, a rod  
35 78 reciprocating longitudinally of the machine, a belt A moving under said magazine and provided with means for moving said blanks therewith, a pusher 30 cooperating with said belt for starting the blanks suc-  
40 cessively from said magazine M, a plunger N' attached to said rod for discharging successive charges of cigarettes from said cigarette-magazine into the boxes as they pass there-  
under, means for folding the side flaps of the  
45 blank to form the sides of the box, a folder 38 for lifting and folding the forward flaps of the blanks, lugs upon said rod for actuating

said folder, means for folding the rear flap of said blank to complete the folding of the box, a cover-holder for holding covers in line  
50 with the movement of said box upon said belt, a cover-magazine P adjacent to said cover-holder and above said belt and in line therewith, and a plunger 54 attached to said  
55 rod for feeding one cover at a time from said magazine into said cover-holder, substantially as described.

15. The combination, in a machine for folding box-blanks having flaps 20, 21 and 22 substantially as described, of a channel wherein  
60 said blanks move in succession having side guides *u* with inclined faces gradually approaching the vertical position for folding the flaps 22, a folder 41 attached to the devices for moving said blank in said channel for fold-  
65 ing the flap 20 to the vertical position, the lifting-folder 38 for lifting the flap 21 to the vertical position and then for folding said flap down, the arms 42 interposed in the path of movement of the vertical flap 20, the  
70 toothed wheels 43 revolving peripherally in the same direction as the movement of the blank and adapted to engage the flap 20 and to fold the same down, a reciprocating rod 78 operating in time with the devices for mov-  
75 ing the blank in said channel, the stops 91, 92 upon said rod, the shaft 40 bearing the folder 38 and the arm 42, the arm 93 attached to the shaft 40 and adapted to be engaged successively by said stops, and the spring-  
80 pressed arm 94 adapted to engage said arm 93 and to hold the same in the position to which either of said stops move it until moved by the other of said stops, substantially as described.

CHARLES W. VAN VLEET.  
ASA HURD.

Witnesses as to Charles W. Van Vleet:

E. H. MARSELLUS,  
WM. H. BOWMAN.

Witnesses as to Asa Hurd:

C. H. AUSTIN,  
G. D. ROSE.