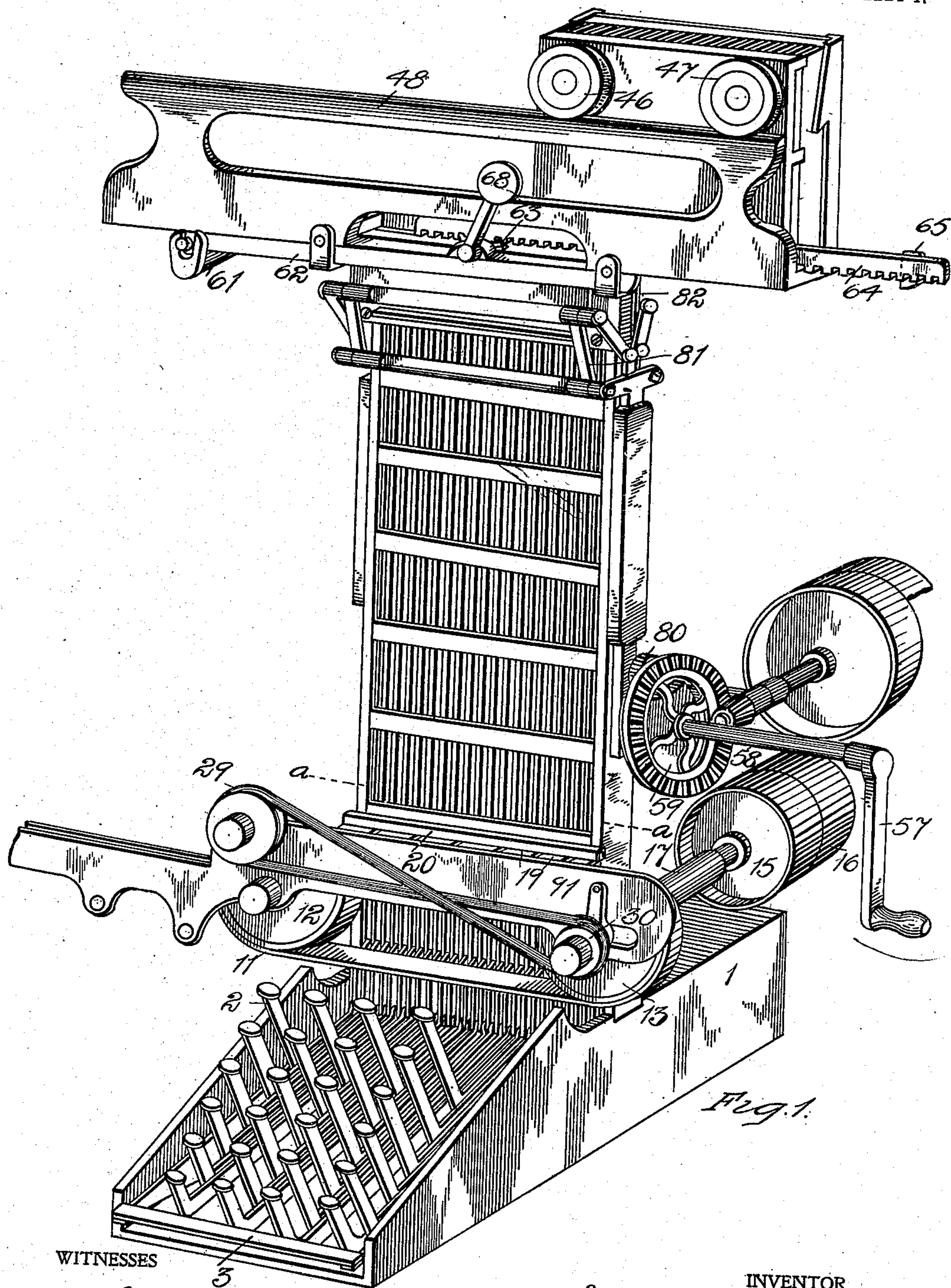


899,843.

L. ROBERTS.  
TYPE SETTING AND DISTRIBUTING MACHINE.  
APPLICATION FILED JULY 11, 1907.

Patented Sept. 29, 1908.  
5 SHEETS—SHEET 1.



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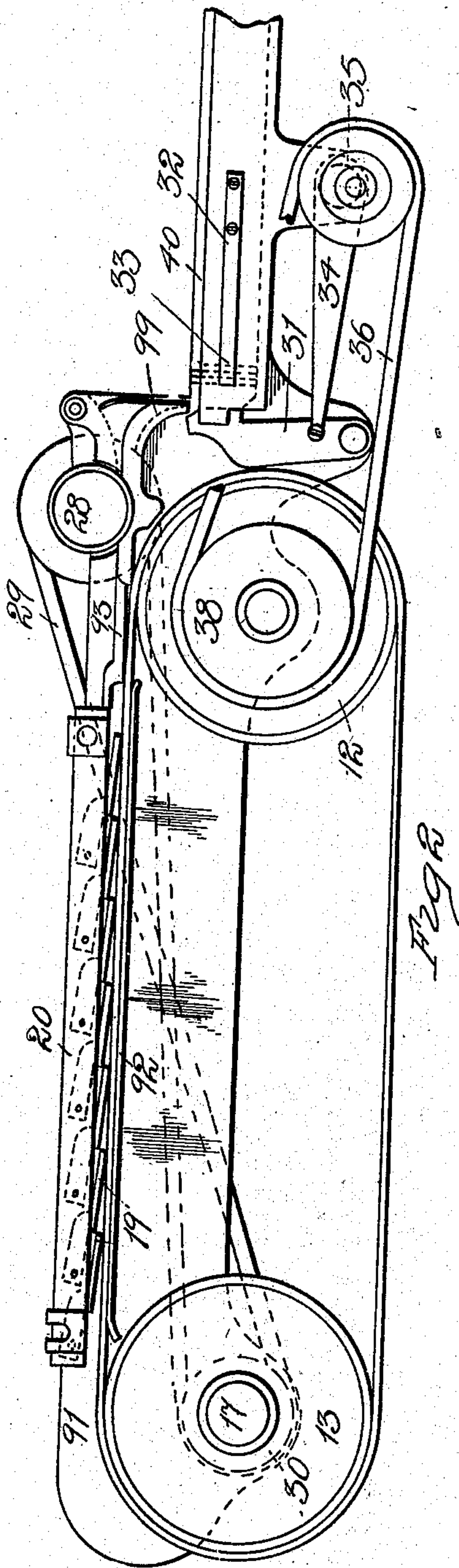


Fig. 2

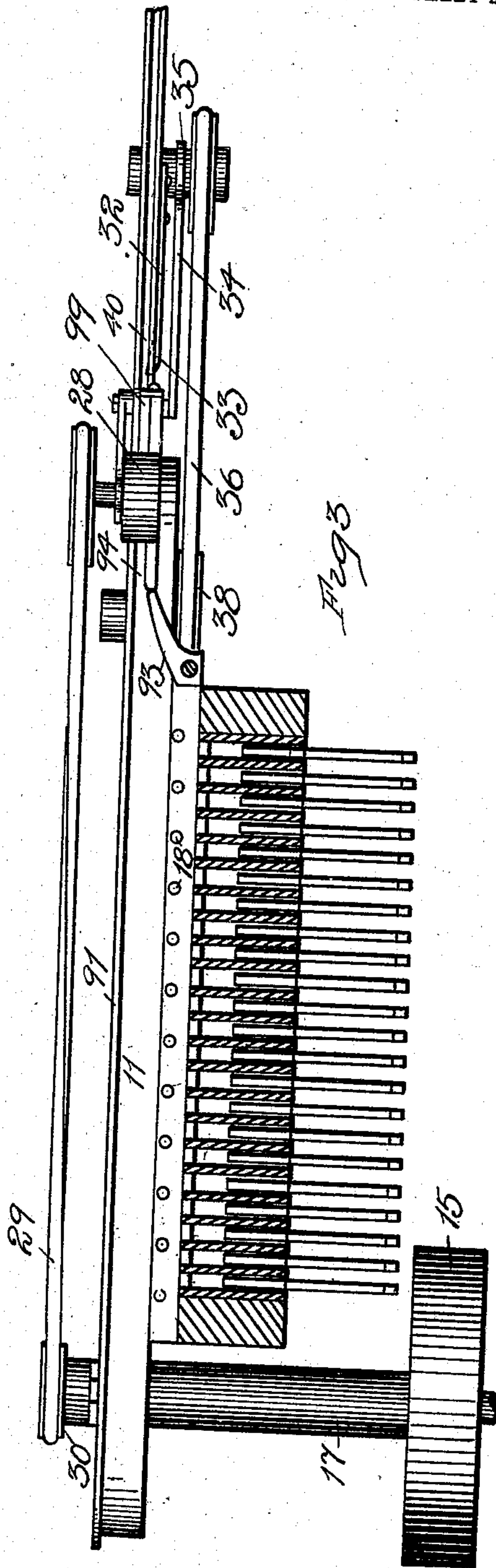


Fig. 3

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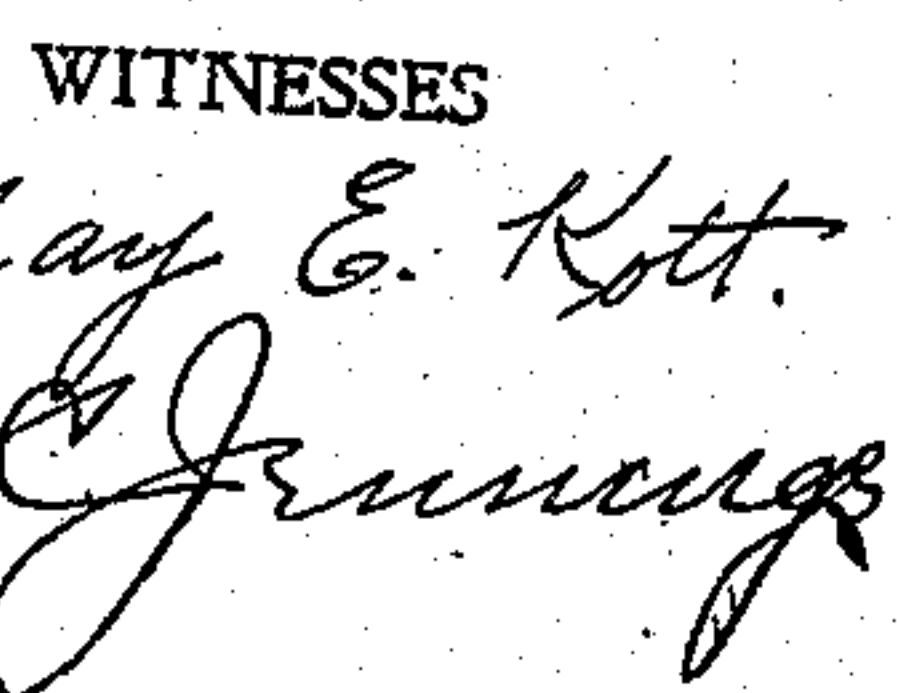
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 5 SHEETS—SHEET 4

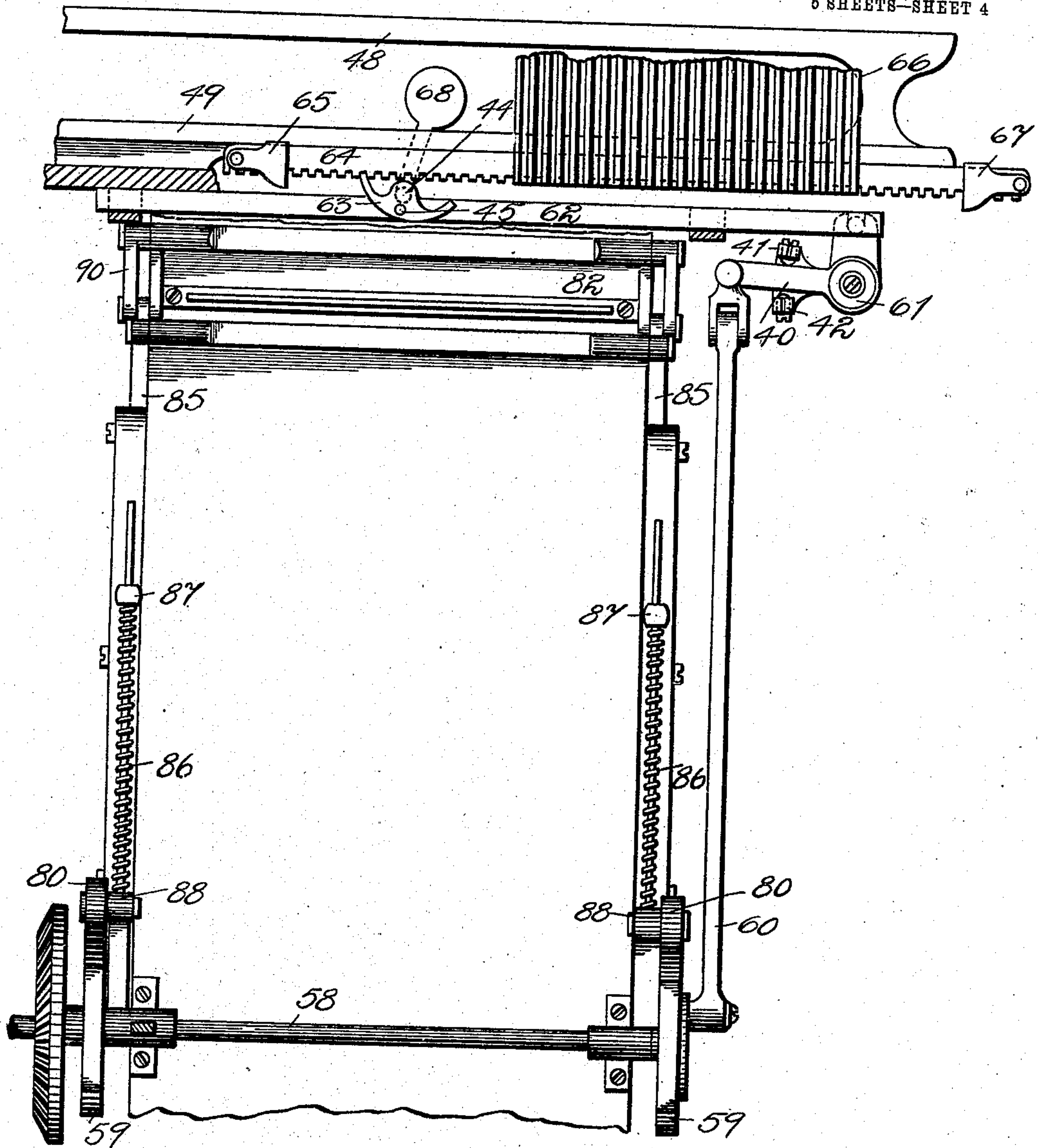


Fig. 5

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 5 SHEETS—SHEET 5.

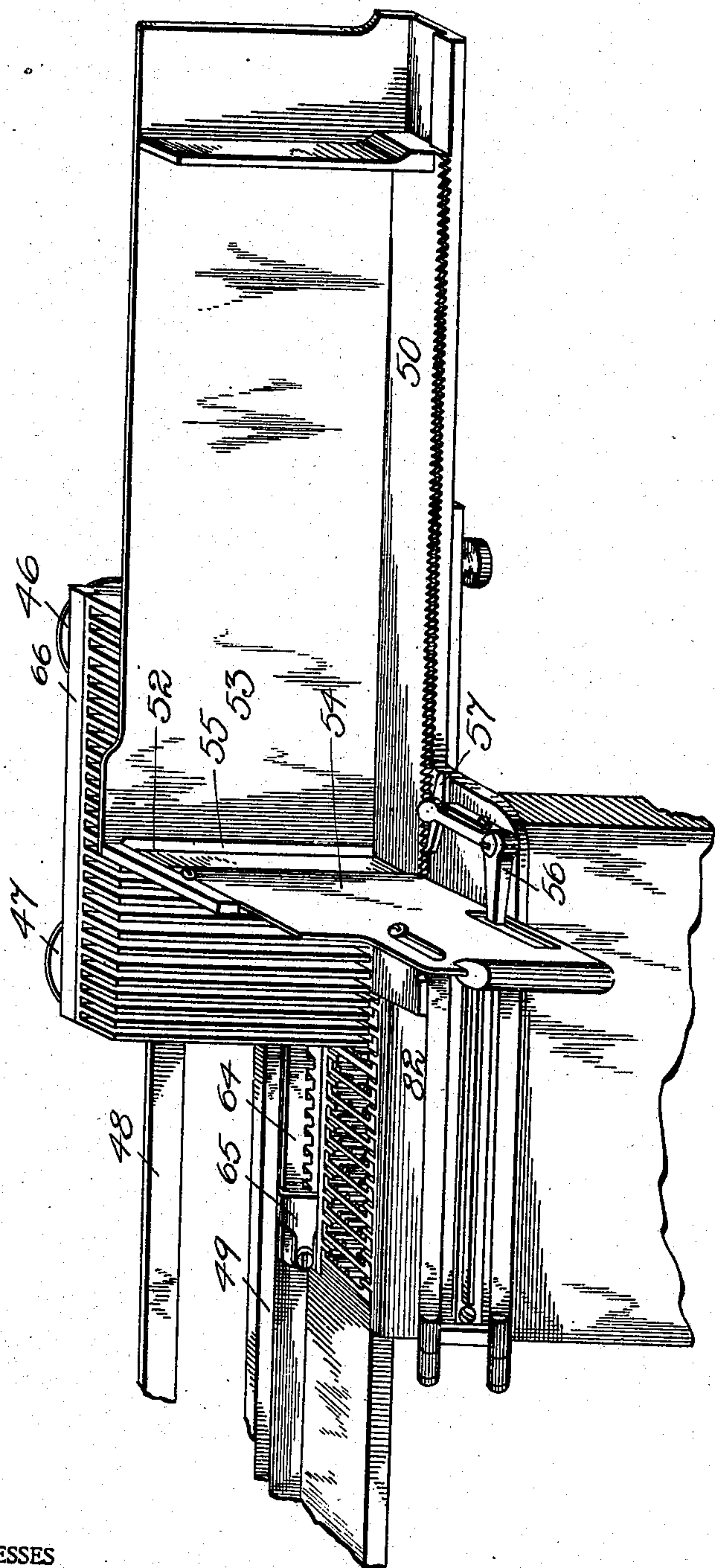


Fig. 8.

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# UNITED STATES PATENT OFFICE.

LUDD ROBERTS, OF JACKSON, MICHIGAN.

## TYPE SETTING AND DISTRIBUTING MACHINE.

No. 899,843.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed July 11, 1907. Serial No. 383,169.

*To all whom it may concern:*

Be it known that I, LUDD ROBERTS, a citizen of the United States, residing at Jackson, county of Jackson, State of Michigan, have invented a certain new and useful Improvement in Type Setting and Distributing Machines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to type setting and type distributing machines.

It has for its object an improved machine intended to be used for the purpose of setting type corresponding to keys that are struck by an operator and automatically distributing the type that have been so set.

In the drawings:—Figure 1, is a perspective of an assembled machine. Fig. 2, is a rear elevation of that part of the machine which carries the type forward to the assembling channel after they have been expelled from the magazine in which they are stored. Fig. 3, is a cross section of the machine along the lines *a—*a** of Fig. 1. Fig. 4, is an elevation of the expelling lever and a cross section of the carrier at the front of the machine. Fig. 5, is an elevation of the rear of the machine showing the distributing carriage. Fig. 6, shows partly in section a mechanism which prevents the type in process of distribution from catching in the magazine opening and clogging. Fig. 7, shows the same parts shown in Fig. 6, but in a different position. Fig. 8, shows a loading device used for the purpose of loading the traveling carriage with type to be distributed.

The setting part of the machine comprises a base 1, in which are pivoted a number of key levers 2. The key levers equal in number the character type which are to be used in the machine with an additional long bar 3, which is used as a spacing key. Each key lever has cooperating with it a vertical magazine adapted to be filled with type having the face value of the key lever. The type drop through the magazines by gravity and are expelled by an oscillating expelling lever.

A single magazine section, a key lever, and an expelling lever are shown in Fig. 4. The magazine section consists of a plate provided at its upper end with a vertical channel which has a width equal to the length of an ordi-

nary type. Along the face of the channel and midway between its vertical sides is a rib 21 extending about one-half the depth of the channel and adapted to engage in a nick in the front of the type, (that is, on that side of the type which would be toward the operator in hand composing.)

At the extreme top of the channel there are short selector ribs *a, b, c, d*, in addition to the long main rib just spoken of, which short ribs engage in other nicks in the type, and these short ribs are the means of selecting the type which the magazine is to contain; each section of the magazine is provided with its own unique set of ribs corresponding to similarly unique grooves or nicks in the front of the type so that with a type machine adapted to set ninety varieties of type, there would be ninety differently arranged sets of magazine openings for their reception. The short selector ribs extend into the magazine only a short distance and below the selecting ribs, the groove or channel is unobstructed except for the long central rib 21. The rib 21 and the side guides 22 and 23 terminate at the bottom of the magazine, and between adjacent magazine standards there is an opening within which is located an expelling arm 7 pivotally connected to the standard by a pivot 8 and connected to the key 2 by a link 9.

The upper end of the expelling arm 7 is provided with a cross head 71, and the upper face of this cross head has at its front, toward the front of the machine, a depressed portion 72, on which a type dropping through the magazine A comes to rest in front of the shoulder 73. Whenever the operator presses the finger button on the key lever 2, the resulting movement of the key lever swings the upper end of the expelling arm forward under a table 10 at the front of the machine. The surface of the depressed portion 72 is slightly curved, and the type rests upon it, with the front end slightly raised above the extreme front of the expelling arm; the type assumes this position primarily because of the weight of the column of type which rests on the lowermost type, and which forces the rear end of the type down against the surface of the arm, and lifts the front end of the type slightly off from the surface of the arm, and as the type is carried forward by the movement of the arm, the type rides over the table 10, while the arm itself travels forward under the table 10. In its forward travel the type passes between pins 18, and the front end of



the type is forced into engagement with the traveling belt 11; the traveling belt 11 is driven in continuous travel around sheaves 12 and 13, which are themselves driven from any convenient source of power by driving wheels 15 and 16, one of which is fixed to the shaft 17, and the other of which is a loose pulley for use during periods of inactivity of the machine. The upper run of the traveling belt 11 rests upon and travels over supports 92, which maintain its upper surface in line with the upper surface of the table 10, and closely adjacent to the front edge of said table in a position to receive and carry forward the type which are projected from the magazine across the table onto the belt.

The pins 18 which project from table 10 are located in front of parting plates between the magazines, and are on the edge of the table closely adjacent to the belt; preferably there is only one pin to two magazines, thus making the space between consecutive pins somewhat more than twice as great as the depth of a type body; when a type is projected across the table its front end strikes the rapidly moving belt before its rear end leaves the table, the front end begins to travel with the belt, and the pins 18 prevent the rear from moving along the table and cause the axis of the type to swing from a position at right angles to the belt to a position that is angular to the axis of the belt, and the forward end of the type (which is the nicked or bottom end of the type) leads the rear end, and is properly disposed to be completely ratified by finger 95.

A number of hangers 19 are pivoted to a bar 20 just above the belt 11, their lower surfaces inclining in the direction of motion of the belt, that portion of the lower surface of each of said hangers which is just below the pivot being highest; and a sufficient distance above the surface of the belt to permit a type to pass under it. The edges of the hangers 19 which are toward the magazines are beveled so as to permit of a type raising them as it is forced under them. The incline under face of each hanger rests on pins 18. The pin prevents the lower face of the hanger from coming into closer relation with the belt than the thickness of a thin type and the beveled edge and pin co-acting together make it possible to force a type of any thickness under the hanger which thereafter presses on the type to prevent its being rolled over. Each hanger comprises a pressure member and an arm by which the hanger is pivotally connected to the bar 20. The pressure member of each hanger is short and the hangers are placed in a series along the bar 20 with the pressure member of each hanger engaging under the pivot arm of the next adjacent hanger. The type lifts the hanger slightly, and as the hanger is lifted its pressure member rises under the arm, and the

next adjacent hanger and the type itself is carried forward under the hanger successively, each one of which presents no obstacle to the travel of the type, except its own slight weight or, at most, a part of the weight of two contiguous hangers when the type is passing from under the contiguous one; the pressure members bear upon the type and prevent it from turning on its own axis.

In front of the belt 11 is a guide 91 which rises as a flange from belt support 92, and over the delivery end of the belt projects a finger 93 which crowds the type over toward the guard and delivers it into a narrow channel 94, and under a friction driving wheel 28. The wheel 28 is of greater perimeter than the pulley 30 from which it is driven by a cross belt 29, and it consequently travels at a less rate of speed than the perimeter speed of the pulley 30, and at a considerable less rate of speed than the perimeter speed of the larger wheel 13, or the speed of the belt 11. The driving wheel 28 travels at a much slower rate of speed than the belt 11, and the type as it leaves the belt and passes under the wheel 28 diminishes its speed of progression and is delivered into the assembly race without injury. After passing the driving wheel 28 the type travels down an incline 99 and drops, nicked end down, into an assembly race 40 in front of the packer 31. In the side of the assembly race is a friction spring 32, the end of which 33 bears through a slot in the wall of the assembly race against the last of the type that has been dropped into the assembly race, and driven forward by the packer 31. The packer 31 is reciprocated by a pitman 34, actuated by a cam wheel 35, and the cam wheel itself is driven by a belt 36 from a belt wheel 38, preferably constructed as a part of pulley 12.

When the type are used they are assembled in galleys in the usual form, and for distribution are first placed in a carriage loading device, shown in Fig. 8; this device somewhat resembles a galley, except that the plate 50 upon which the type rest, is movable and carries the type resting upon it toward the end 52 of the loader.

Through the plate 53, against which the nicked ends of the type engage, is a slot 55 of a size suitable to allow an entire line of type to be forced off from the sliding plate 50 through said slot, or opening in the plate 53. Against the end 52 of the loader is secured, slidingly, an actuator 54 by means of which a line of type which has been brought in front of the opening 55 may be pushed through said opening 55. The plate 53 lies against and in the same plane with one face of the distributing magazine 66, so that a line of type forced through the slot 55 will be received into one of the compartments of said magazine. The retraction of the slide 54 actuates a bent lever 56 which carries a



pawl 56<sup>a</sup>, and the pawl engages with a ratchet edge of the sliding plate 50 and forces the sliding plate forward, bringing the type resting upon it up into engagement with end 52 with a new line of type under the slide in position to be driven through the opening 55. At the same time that the body of the type are pushed forward in the way just described, the distributing magazine 66, into which the line of type is to be pushed, is moved forward an equal amount, or a proper amount by the hand crank 57, seen in Fig. 1.

The hand crank 57 turns the shaft 58 on which are mounted cams 59 whose purpose will be explained hereinafter, and an eccentric or a crank 60, which actuates a lever 40 pivoted to the pivot pin of a bent lever 61, the lever 40 oscillates between adjusting screws in lugs 41 and 42, which lugs are on an arm of the lever 61; the lever 61 reciprocates rod 62 upon which there is mounted a double acting pawl 63; the pawl 63 engages the rack 64 connected with the distributing magazine 66, giving to the distributing magazine a step by step movement which alternates with a magazine mouth clearing operation hereinafter to be described.

The reciprocating movement of the rod 62, and the consequent actuating movement of the pawl 63, continues until the rack 64 has traveled in one direction to bring a trip 65 or a trip 67 secured toward the ends of said rack into engagement with the pawl 63. With the pawl in the position shown, the rack 64 would travel to bring the trip 67 in contact with a pin 44 just above the pivot 45 of the pawl, and this will lift the disengaged end of the pawl toward the rack and depress the engaged end of the pawl, drawing it away from the rack until a weighted arm 68 secured to or forming part of said pawl has passed the vertical over the pivot of the pawl and the weighted arm completes the shifting of the pawl and brings the previously disengaged end into engagement with the rack, and the next reciprocation of the rod 62 commences a return movement of the rack and of the traveling magazine to which it is attached.

The distributing magazine is supported in close relation to the top of the type magazines from wheels 46 and 47, which run on a track 48; the rack 64 engages under a rib 49 which holds the distributing magazine to place.

Between the successive movements of the distributing magazine the cam 59 rotates with its low part in engagement with an anti-friction wheel 80. During the travel period of the magazine, the anti-friction wheel 80 is in contact with the high part of the cam and continues in contact for approximately three-quarters of a revolution of the cam. During the time of contact be-

tween the anti-friction wheel 80 and the high part of the cam, that is, between the movements of the distributing magazine the mouth openings of the type magazine are cleared and kept clear from any of the type that may have fallen into but not through the mouth opening. The mechanism for producing the result will be understood by an examination of Figs. 6 and 7.

At the upper part of the magazines are a pair of plates 81 and 82; these are provided with short angular fingers 83 and 84 arranged along the upper edges, which may engage between the uprights of the magazines and extend into the chambers. At the first part of their engagement in these chambers the upper surfaces of the fingers 83 and 84 are below the selector ribbed parts of the magazines; subsequently they rise until the upper surfaces are in a plane with the upper level surface without obstruction to the lower surface of the distributing magazine. The plates 81 and 82 are pivoted to a vertically sliding pitman member 85, which is normally pressed downward by a spring that engages against an abutment bracket 87, and against a bracket 88 on the pitman member; the pitman member is itself tubular and within the bore of the tube is a second sliding member 89, which has pivoted to its upper end a pair of links 90 and 91; these links are pivoted to the plates 81 and 82. The sliding member 89 is normally pressed downward into the member 85 by a spring 92 that bears against the upper end of the sliding member 89 and against any suitable abutment near the upper end of the magazine casing. In order that the device may be without strain, both ends of the case are provided with similar pitmen, and the plates and sliding members 81 and 82 extend continuously from end to end of the magazines. The cams 59 and 59 are symmetrical and operate similar devices at each end of the machine, except that only one of them carries a crank pin 60.

During the period that the anti-friction wheel 80 is engaging the low part of the cam 59, the spring 86 presses the anti-friction wheel and the bracket on which it is supported, and the entire sliding member 85 downward, and the plates 81 and 82 spread, swinging the fingers 83 and 83 clear from contact with any type that may be in position to drop into the type magazines and any type that may be above its own or proper magazine, drops past the ribbed selector opening into the magazine. Should any type drop partially in, as sometimes happens, and attain a position such that it would, if left there, prevent the free movement or obstruct the free movement of the carrier, then the operation of the clearing fingers becomes effective, because before the



carrier starts to travel, the cam 59 turns to bring its high part into engagement with the anti-friction wheel 80, and this lifts the sliding member 85 and the plates 81 and 82 close in, inserting the fingers 83 and 84 under the obstructing type, lift it clear from the mouth of the magazine, forcing it up into the carrier and furnishing an unobstructed path for the carrier. The subsequent downward movement of the sliding member 89 spreads the fingers 83 and 84, as hereinbefore described, and leaves the type free to fall into the magazine.

What I claim is:—

1. The combination of a type magazine provided with vertical channels for type, a type carrying carriage having vertically arranged channels adapted to register with the channels of said magazine, means for producing an intermitting travel of said carriage, means for preventing the type from obstructing the travel of said carriage and means for automatically reversing the travel of said carriage, substantially as described.

2. In a type setting machine, in combination with a type magazine, a lever adapted to expel a single type from said magazine, a table across which said expelled type travels, a belt adjacent to said table and movable at an angle with respect to the travel of the type across said table, a pin adapted to engage the rear of said type and remain in engagement therewith after the forward end has engaged the belt, a pressure plate held from close contact with said belt by said pin, said pin and plate coacting with said belt to turn said type to bring its axis parallel with the line of travel of said belt and prevent it from rolling on its axis, substantially as described.

3. In a type setting machine, in combination with a type magazine, means for expelling type from said magazine, a table over which the type travels after leaving said magazine, a belt adapted to receive and carry forward said type, a pin located in front of said magazine, a hanger located over said belt and extending with an inclined face over said pin whereby the said type is adapted to pass under the inclined part of said hanger and on to said belt under said hanger, substantially as described.

4. In a type setting machine, in combination with a traveling belt, a plurality of hangers each of which is provided with a pressure member and a suspension member, the pressure member being adapted to be lifted slightly by a type traveling thereunder and when lifted being adapted to engage with the suspension member of an adjacent hanger whereby the under surface of the several pressure members present no obstruction to the pressure of the type other than the weight of the hanger in immediate engagement with the type, substantially as described.

5. In a type setting machine, in combination with a traveling belt, and means for directing a type onto said belt, a passage in continuation of the upper run of said belt, a friction wheel adapted to engage and advance the type leaving the upper run of said belt, means for producing a peripheral speed of said wheel of less velocity than the speed of said belt, whereby the said wheel while advancing the said type acts to reduce its speed of travel, substantially as described.

6. In a type setting machine, in combination with a traveling belt and means for depositing a type on said belt, hangers located over the upper run of said belt adapted to engage the upper surface of a type traveling thereon, a guide finger located above said belt, a friction driving mechanism located in a continuation of the upper run of said belt, an assembling channel, a curved track between the friction driving mechanism and the assembling channel adapted to change the direction of said type and to deposit the type in the assembling channel with its long axis in a vertical position, a packing arm engaging in said channel and adapted to push the assembled type forward, substantially as described.

7. In a type distributing machine, in combination with a magazine provided with a ribbed inlet opening, a clearing finger adapted to enter said inlet opening at the sides and below the mouth, and means for lifting said clearing finger, substantially as described.

8. In a type distributing machine, in combination with a magazine for the storage of type provided with selective ribs in the upper mouth opening thereinto, clearing fingers adapted to close into said mouth below the upper opening thereinto, means for closing said fingers toward each other, and means for lifting said fingers, substantially as described.

9. In a type setting machine, in combination with a magazine provided with selective ribs at the mouth opening thereinto, a distributing carriage having channels for lines of type, means for producing an intermitting movement of said carriage, means for clearing the mouth opening of said magazine during the intervals between movements of said carriage, substantially as described.

10. In a type distributing machine, in combination with a magazine for the reception of type, a carriage for type to be distributed, means for clearing the mouth opening into said magazine, means for automatically moving said carriage in alternation with the movement of the clearing means, substantially as described.

11. In a type distributing machine, in combination with a type carrying carriage, a loading device provided with means for expelling a line of type therefrom into a channel of said carriage, means for advancing a



mass of type in said loading device, and manually actuating means for advancing said carriage to bring the empty channel into register with the line of type to be expelled  
5 from said loading device, substantially as described.

12. A loading device for type distributing machines, comprising an apertured plate, a  
10 type, a slidable expelling plate adapted to

reciprocate in register with said aperture, means actuated by said reciprocating plate for actuating the sliding plate, substantially as described.

In testimony whereof, I sign this specification in the presence of two witnesses.

LUDD ROBERTS.

Witnesses:

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