

1,045,722.

A. J. McCAULEY.
PRINTING MACHINE.
APPLICATION FILED JAN. 23, 1912.

Patented Nov. 26, 1912.
6 SHEETS—SHEET 1.

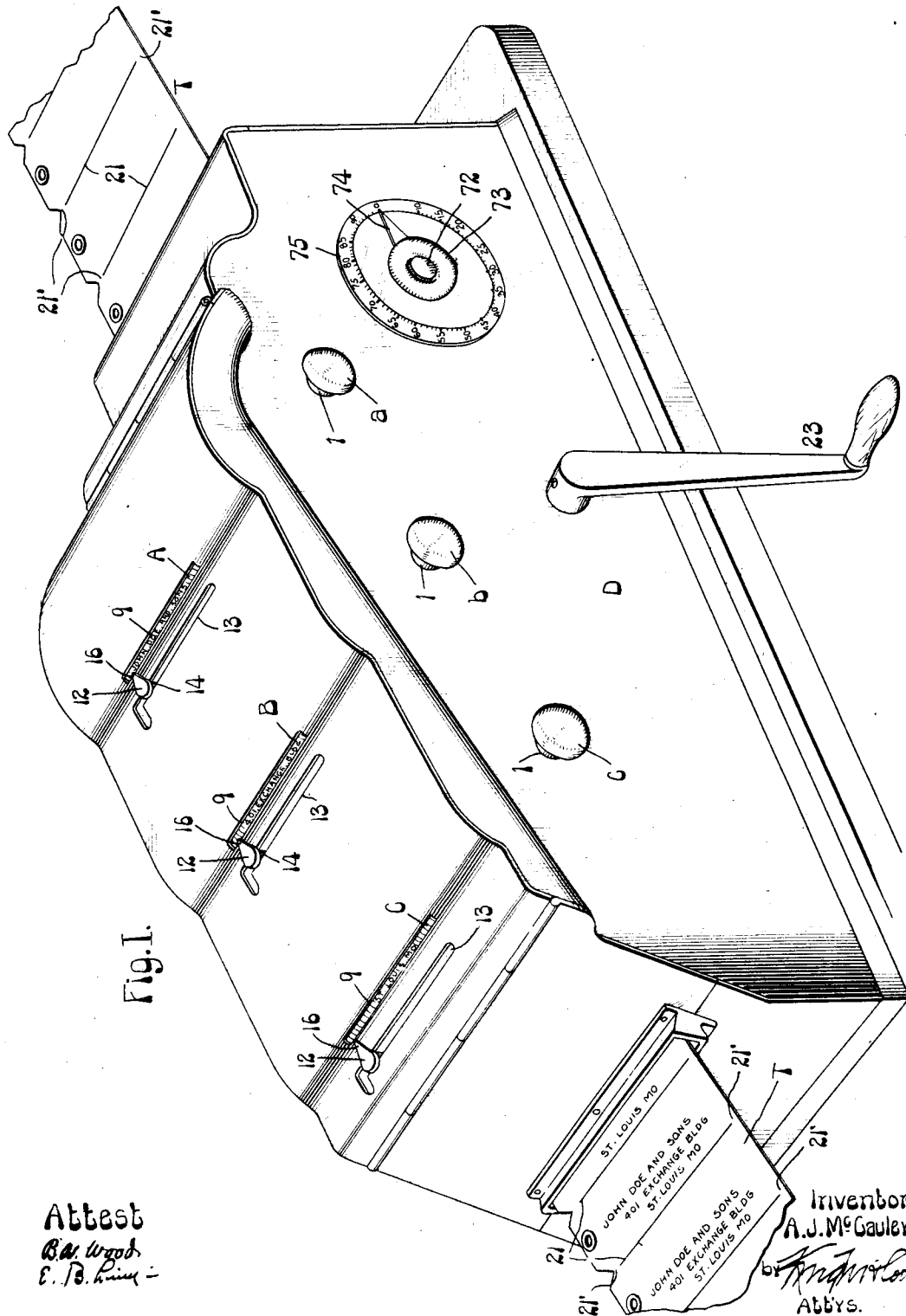


Fig. I.

Attest
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C. B. King

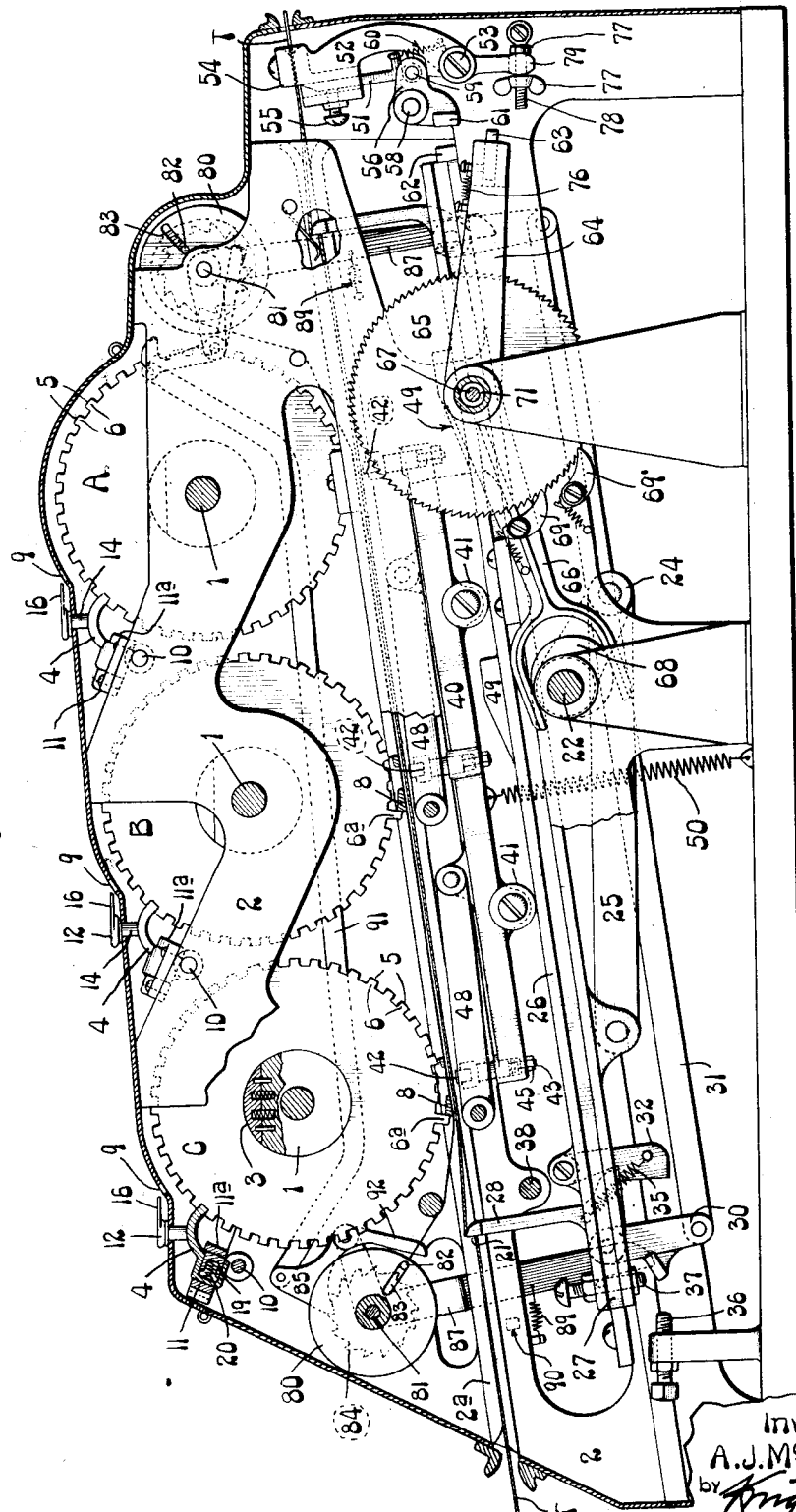
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6 SHEETS—SHEET 2.

Fig. II.



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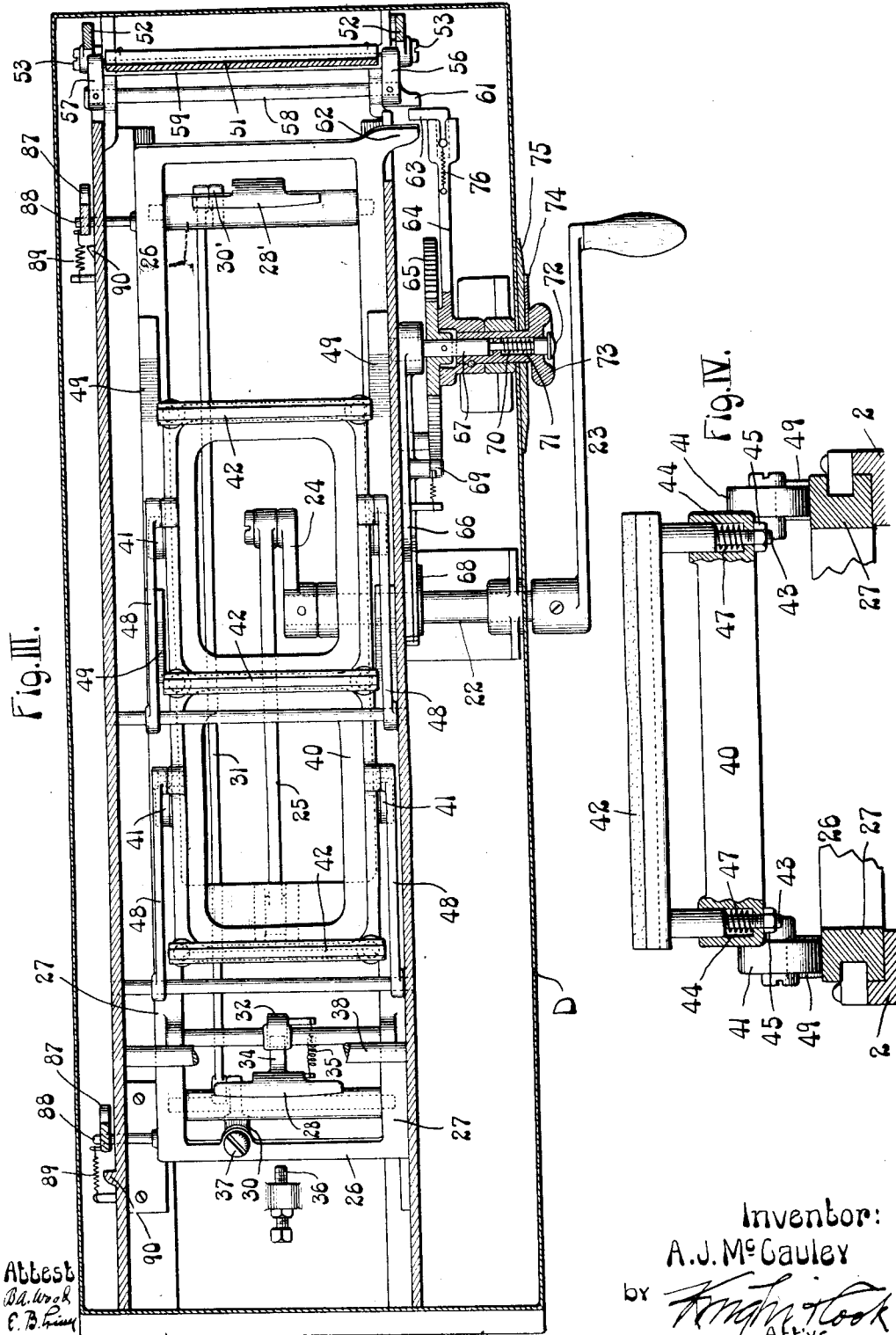
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6 SHEETS—SHEET 3.

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6 SHEETS-SHEET 4.

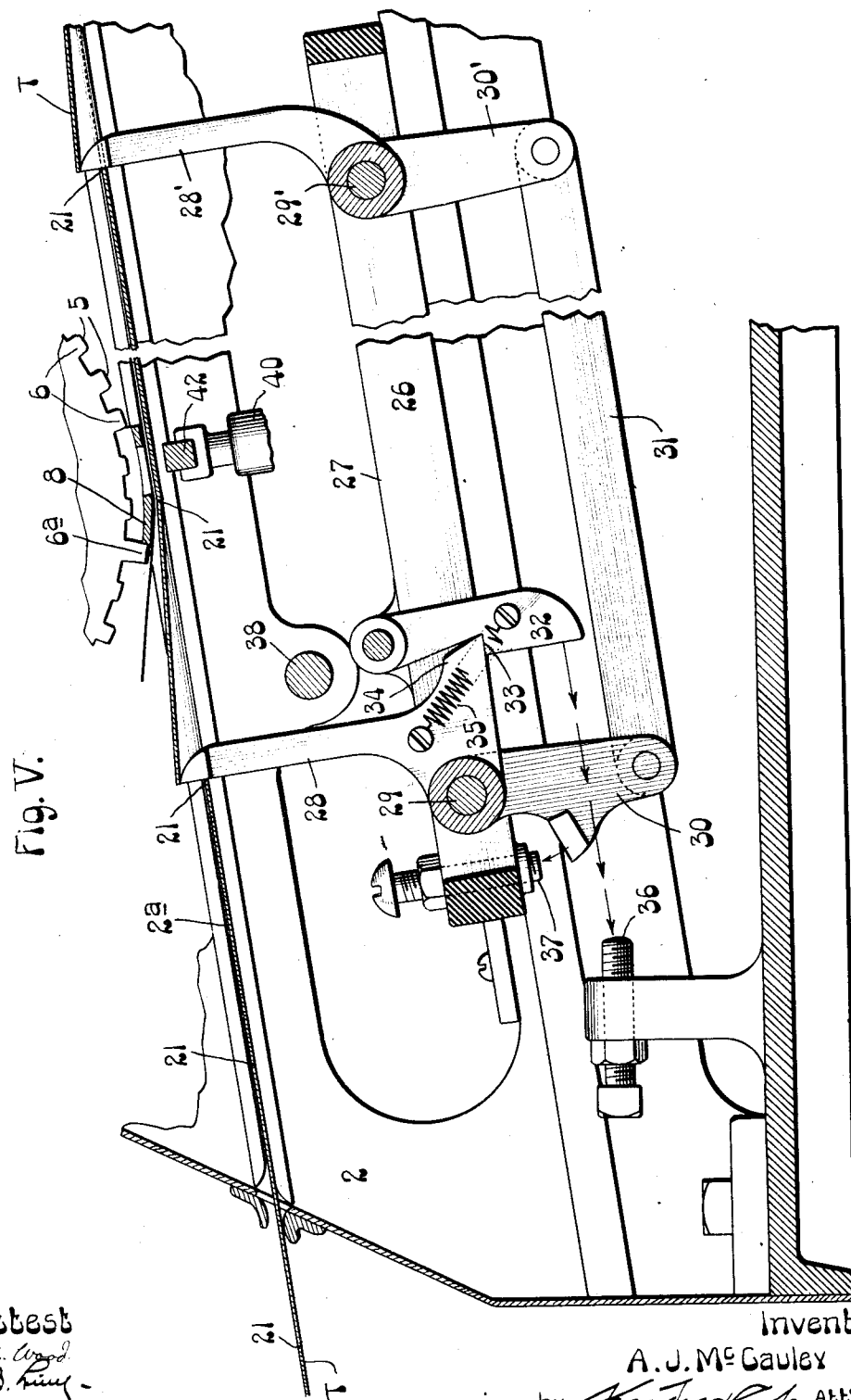


Fig. V.

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6 SHEETS—SHEET 5.

Fig. VII.

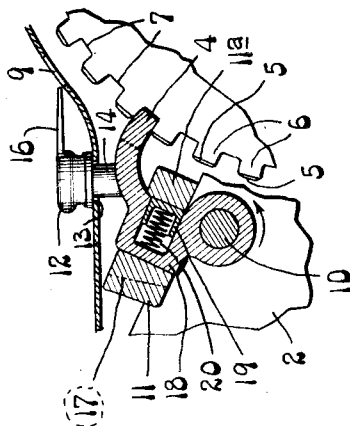
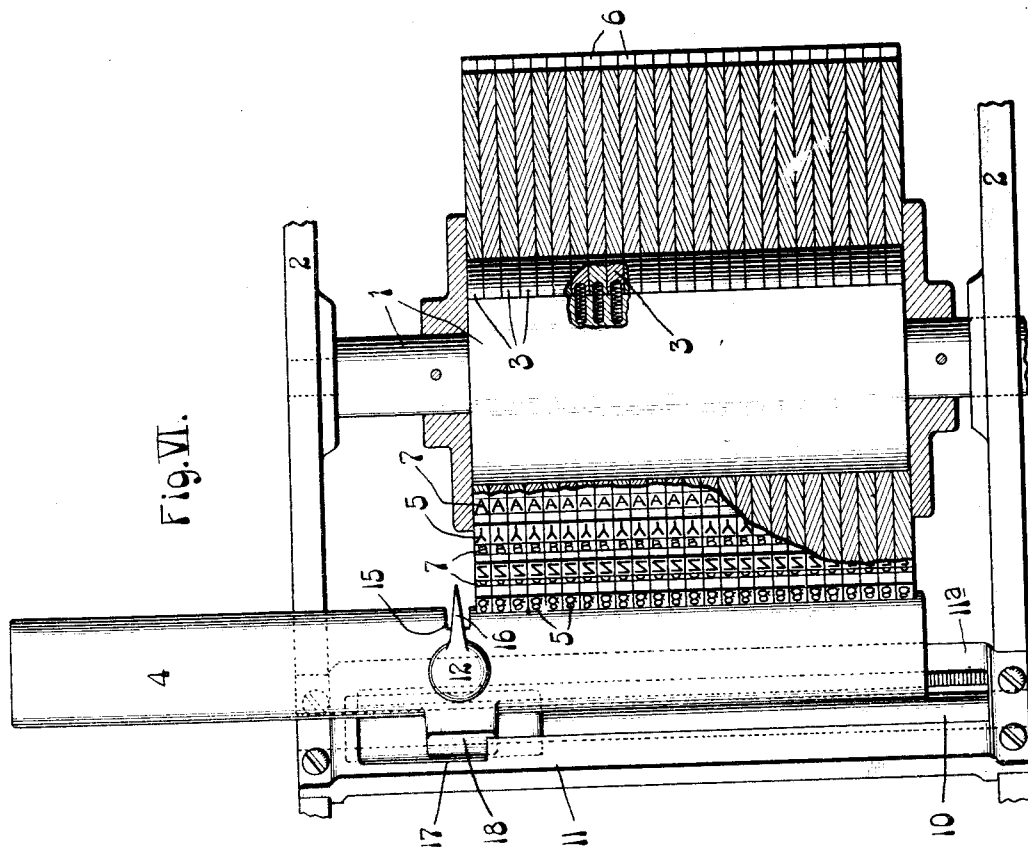


Fig. VI.

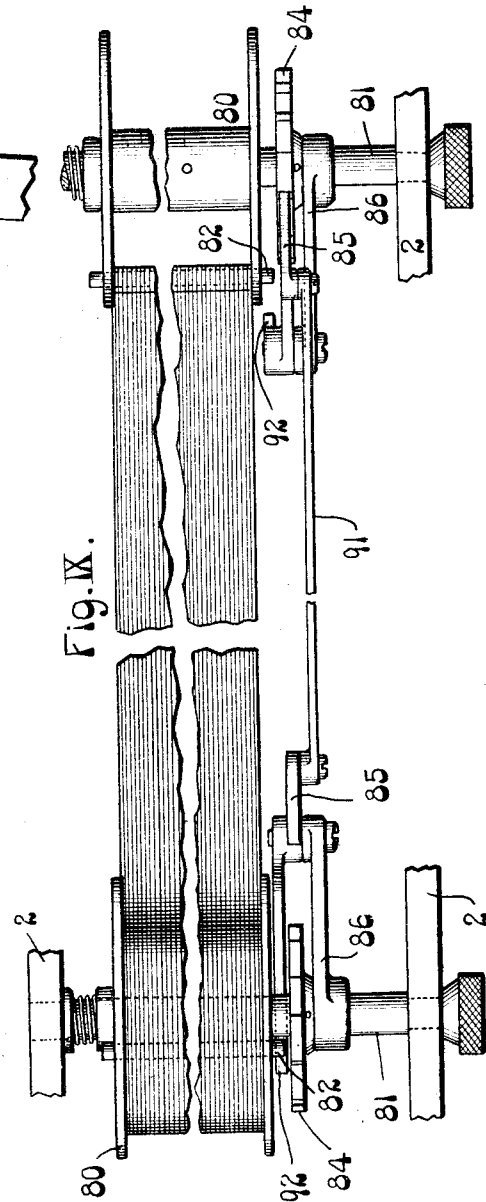
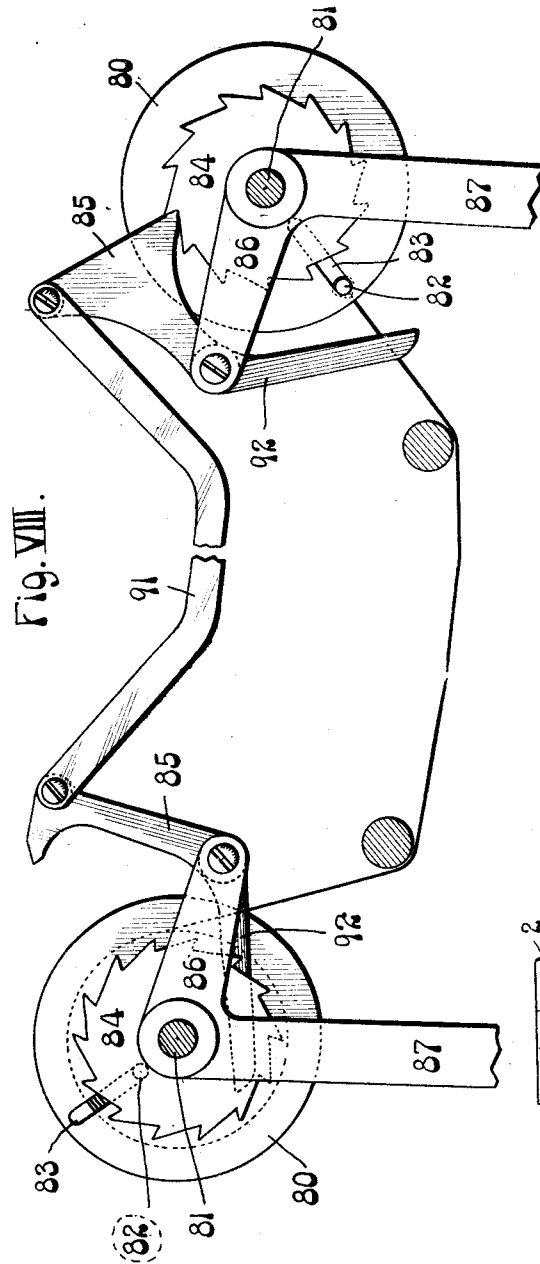


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6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

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PRINTING-MACHINE.

1,045,722.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed January 23, 1912. Serial No. 672,822.

To all whom it may concern:

Be it known that I, ALBERT J. McCAULEY, a citizen of the United States of America, and a resident of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Printing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to a printing machine adapted to print addresses, or other matter, on shipping tags, or the like, connected in long strips.

The main object of the invention is the production of a simple, efficient and substantial machine of this character devoid of fine or delicate mechanism.

Other objects and advantages as well as the novel details of construction will hereinafter appear.

Figure I is a perspective view of a machine embodying the features of this invention. Fig. II is a vertical section of the machine. Fig. III is a horizontal section showing the lower portion of the machine. Fig. IV is a detail view illustrating the reciprocating carrier and the platen operable by said carrier, partly in elevation and partly in section. Fig. V is an enlarged vertical section, partly broken away, of the feeding mechanism. Fig. VI is a plan view, partly in section, of a bank of the type wheels and means for locking said wheels. Fig. VII is a fragmentary view of the means for locking the type wheels. Fig. VIII is an elevation, partly in section, of the ribbon feeding mechanism. Fig. IX is a plan view of the ribbon feeding mechanism shown in Fig. VIII.

The machine shown in the accompanying drawings illustrates an embodiment of my invention in its preferred form, and it should be first stated that the machine is one intended more particularly for use in printing labels, such as shipping tags, or other tags. It is further to be noted that the structure of the machine is preferably such as to print objects that are arranged in series and integral with each other, as for instance, a plurality of tags in a strip of paper that is slitted at intervals to produce the tags that are to be delivered into

the machine and fed therethrough to be printed.

For the sake of convenience, I will in the following description refer to shipping tags as the particular objects to be printed in my machine, referring to them merely as tags, with the understanding that in so doing I do not limit myself to the use of my machine for the printing of any particular object.

Briefly stated, my machine comprises the following elements, to-wit: a plurality of banks of type carriers, the carriers being preferably in the form of wheels and adapted to be adjusted to print addresses, or other matter on tags; means for feeding the tags to said type carriers; an inking ribbon interposed between the type wheels and tags during the passage of the latter through the machine; and a platen support adapted to be moved after each tag feeding operation to move the tags and inking ribbon toward the type carriers to print the tags. If the tags are integrally connected to each other, as is preferable, the machine also includes a cutting device for severing the tags, and means whereby a predetermined number of tags in a tag strip may be printed and said cutter may be thereafter automatically actuated to cut the strip when the desired number of tag feeding operations have taken place.

The type carriers.—The printing type is carried by banks A, B and C of type wheels, each bank of wheels being mounted on a supporting shaft 1 supported by side frames 2. Each type wheel is yieldingly connected to its shaft by spring pressed detents or friction shoes 3. The type wheels may be rotated by turning their supporting shafts and they may be locked against rotation by a key 4 which will be presently more particularly referred to. The shafts 1 extend through the casing D and are provided with setting knobs *a*, *b*, and *c*, (Fig. I), which are rotatable by the operator in adjusting the type wheels.

Each type wheel has peripherally arranged type characters 5, (see Figs. VI and VII), formed on teeth 6, and indicator characters 7 located between said teeth. Each type wheel is also provided with an elongated stop tooth 6^a, (see Fig. II), adapted to

engage a stop bar 8 when the wheel is adjusted to its non-printing position. When the stop tooth 6^a of any particular wheel is engaged with a stop bar 8, no type character on said wheel is located in printing position and no indicator character on the wheel is visible through the corresponding sight opening 9 in the casing. When the type wheels are adjusted to printing position, the indicator characters seen through the sight openings 9 indicate the matter which will be printed by the type in the operation of the machine.

The keys 4 for locking the type wheels are slidably mounted on rods 10, (see Figs. II, VI and VII), and arranged between guide bars 11 and 11^a. Each locking key 4 extends across a bank of type wheels and may be positioned to lock all of the wheels in the bank as shown most clearly in Figs. VI and VII. The operator may slide the locking keys 4 by shifter knobs 12, located above slots 13 in the casing of the machine, and connected to the keys by stems 14 operable in said slots.

Assuming that a locking key 4 is in the position shown in Fig. VI, and that all of the type wheels are located in their non-printing position, as seen in Fig. II, no indicator characters are at such time visible through the sight openings 9, and the wheels may be unlocked and adjusted to the desired printing positions by the following procedure: The first step in setting a bank of type wheels is to shift the locking key 4 to a position where the notch 15 formed in the edge of said key will register with the first wheel to be adjusted. When a wheel registers with this notch 15, it is free to turn through the locking bar independently of the other wheels, which remain locked, and may be rotated to the desired position by turning the setting knob at the end of the type wheel shaft 1. An examination of the indicator characters visible at the sight opening 9 will show the operator when the wheel is adjusted to the required printing position. The next wheel to be adjusted is unlocked by shifting the locking key 4 to locate the notch 15 opposite said wheel. This movement of the locking key locks the previously adjusted wheel and allows the unlocked wheel to be set through the medium of the shaft setting knob. Any desired number of type wheels may be set in the manner just described and the characters visible through the sight openings 9 will indicate the type characters in position for printing.

Although the locking keys 4 are located within the casing of the machine, the unlocked wheel is indicated by a pointer 16 or other indicator carried by the locking key 4, and preferably extending through the casing to point to the type wheel.

arranged directly above the notch 15 in the locking key. In adjusting the type wheels, the operator may readily ascertain which wheel registers with the notch 15 and the various wheels to be unlocked may therefore be selected very rapidly. Another very desirable feature is that an error may be very easily corrected after the wheels have been adjusted by shifting the pointer to the wheel which is incorrectly adjusted, thereby unlocking said wheel and allowing it to be rotated through the medium of the setting knob.

In resetting the wheels of a bank of type wheels to non-printing position, the locking key 4 is disengaged from all of the wheels of a bank to allow them to turn with the shaft 1, and the shaft is then rotated one complete revolution or sufficiently to engage all of the elongated stop teeth 6^a, with the stop bar 8. Obviously, the teeth 6^a of different wheels will strike the stop bar 8 at different times, but as the wheels are yieldingly connected to the shaft and movable independently of each other, the shaft may be turned until all of the wheels are brought to rest in their non-printing position by the stop bar 8. To allow the locking key 4 to be disengaged from all of the wheels before resetting the type wheels, the guide bar 11 is provided with a recess 17. (Fig. VI), thus permitting said key to rock away from the wheels when the lug 18 on the key is moved into said recess 17. The lug 18 is preferably provided with a cylindrical bore that receives a plunger 19 and spring 20, (see Fig. VII). The spring 20 forces the plunger into engagement with the guide bar 11^a, and when the locking key is shifted to its "resetting" position, said spring forces the lug 18 into the recess 17, thereby rocking the locking key 4 on the pivot rod 10 to unlock all of the type wheels.

The tag feeding mechanism.—This mechanism is illustrated in Figs. II to V, inclusive.

T designates tags present in a strip of paper, the strip being partially severed between the tags by slits 21. The ends of said tags are integrally connected at 21'. The function of the feeding mechanism is to push these tags step by step toward and past the banks A, B and C, of type wheels; thereby positioning the tags to allow several lines of printing to be performed thereon, as, for instance, the top, middle and bottom lines of an address, the printing being effected by the banks of wheels A, B, and C, respectively. The tags enter the rear end of the machine, pass through suitable guide-ways 22 on the main frame 2, and after being printed are discharged at the front end of the machine.

It is to be understood that the foregoing description is intended to illustrate the invention and is not to be construed as limiting the scope of the invention.

with an operating handle 23. A crank 24 at the inner end of the main operating shaft is connected by a pitman 25 to a tag feeding mechanism carrier 26. The carrier 26 is a frame adapted to reciprocate in response to rotary movements of the crank 24, said frame having side bars 27 slidably fitted to the main side frames 2. 28 and 28'' are feeder fingers or pushers pivoted to the carrier 26 at 29 and 29'', respectively. These feeder fingers, for tag feeding action, separate the slitted edges of the tag strip and bear against one of the rear edges of the tags, as seen in Fig. V. Upon each forward movement of the carrier 26, the feeder fingers push the tags one step, and said fingers are then disengaged from the tags, as will be presently described. The feeder fingers are provided with depending arms 30 and 30'' connected by a link 31. This connection causes the feeder fingers to move in unison when they are rocked toward or away from the tags.

A tripable dog 32, pivoted to the carrier 26, has a shoulder 33 adapted to interlock with a tail piece 34 on the feeder finger 28. A spring 35, or other yieldable member, connecting the feeder finger 28 to the dog 32, tends to rock said feeder finger away from the tags, but such movement is prevented when the dog 32 is interlocked with said feeder finger. An abutment 36, preferably in the form of a screw, is located below the carrier 26 and in the path of the dog 32, (see arrows in Fig. V). When the dog 32 strikes the abutment 36, it is disengaged from the feeder finger 28, and the spring 35 then pulls the connected feeder fingers 28, 28'' away from the tags. The tag feeding action is therefore stopped automatically at a predetermined point, at which tags are positioned for printing operation. After being disengaged from the tags, the feeder fingers rock rearwardly and downwardly until the arm 30 strikes a screw 37 in the carrier 26. The feeder fingers are held in this latter position by the spring 35 during the rearward movement of the carrier 26 until the finger 28 strikes a stationary abutment 38. As the carrier continues to move rearwardly after the feeder finger 28 engages the abutment 38, the connected feeder fingers are elevated to again engage the tags, and upon being elevated they are automatically locked in feeding position by the spring actuated dog 32, due to its engagement with the tail piece 34 of the feeder finger 28.

The platen mechanism.—An inking ribbon is preferably interposed between the banks of type wheels and the tags, and a platen is arranged beneath each bank of type wheels to move the tags and inking ribbon toward the type wheels.

The platen mechanism is shown most clearly in Figs. II, III, and IV. A platen

carrier 40 is arranged beneath the banks of type wheels, said platen carrier being provided with rollers 41, which rest on the feeder carrier 26. Platen bars 42, located adjacent to the banks of type wheels are provided with depending threaded posts 43 operable in spring pockets 44 on the platen carrier 40, (Fig. IV). Nuts 45 fitted to said threaded posts may be adjusted to align the platen bars with the type wheels. The springs 47 in the spring pockets 44 constitute yielding supports for the platen bars and cause said bars to yieldingly force the tags and inking ribbon toward the banks, of type wheels when the platen carrier is elevated. The object in interposing yielding devices between the ends of the long platen bars and the platen support is to cause said platen bars to automatically adjust themselves to the type wheels during the printing operation, with the result of causing a substantially equal pressure to be transmitted throughout the entire length of the platen bars.

The platen carrier 40 is controlled in its movements by links 48 pivotally connected to the sides of said carrier, and also pivoted to the main side frames 2. 49 are cams at the top of the reciprocating feeder carrier 26, adapted to move under the rollers 41 after the feeder fingers have been disengaged from the tags. The cams 49 elevate the platen carrier during the forward movement of the feeder carrier 26, and during the rearward movement of said carrier the platen carrier is restored to lowered position by a spring 50 (see Fig. II).

The means for severing the tag strip after a predetermined number of feeding operations.—The tag strip formed by the integrally connected tags is severed after a predetermined number of feeding and printing operations by a knife or cutter 51 at the rear end of the machine, (see Figs. II and III). The knife 51 is slidably mounted in a knife holder 52 pivoted at 53 to the main side frames 2. The tag strip passes through the upper end of the knife holder 52 immediately below a stationary cutter bar 54. The knife 51 may be adjusted toward the stationary cutting bar 54 by a screw or screws 55 in the knife holder 52. 56 and 57 designate rock arms fixed to a rock shaft 58, the latter being journaled in the main side frames 2. The rock arms 56 and 57 are connected to each other by a rod 59 lying directly beneath a flange at the lower edge of the movable knife 51. Springs 60 normally hold the knife 51 below the tag strip, but when the arms 56 and 57 are rocked upwardly, the rod 59 moves upwardly, with the result of elevating said knife 51. The arm 56 is preferably part of a bell crank lever having a second arm 61 adapted to be engaged by a knife actuating member. The

feeder carrier 26, operated through the medium of the main operating shaft, is provided at its rear end with an abutment 62. When the feeder carrier is at the end of its rearward stroke, the abutment 62 is located very close to the bell crank arm 61, but it does not touch said arm. However, at a predetermined time a movable filler 63 is automatically located between the abutment 62 and the bell crank arm 61 to cause said arm and the movable knife 51 to partake of the movement of the abutment 62, thereby causing said knife to sever the tag strip. The movable filler 63 may be termed a transmission member, as it transmits the movement of the abutment 62 to the knife 51, and the knife is actuated only through the medium of said member 63.

The means for causing the transmission member 63 to transmit movement of the abutment 62 to the knife at a predetermined time comprises a traveling arm 64, to which said member 63 is slidably fitted, said arm being connected to a ratchet wheel 65 which moves step by step in unison with the feeding mechanism. The ratchet wheel 65 is operated by a pawl carrier 66 loosely mounted on a shaft 67 and having a bifurcated end which is fitted to an eccentric 68 on the power shaft, said pawl carrier being provided with a pawl 69 adapted to move the ratchet wheel one step during each revolution of the power shaft. A pawl 69', (Fig. II), prevents retrograde movement of the ratchet wheel 65. The arm 64 is preferably held in frictional engagement with the ratchet wheel 65 by a spring 70 located in a pocket 71 and engaging a shoulder on the shaft 67, (Fig. III). In adjusting the arm 64, it may be released from the ratchet wheel by pressing a push button 72 at the end of the shaft 67, thereby sliding the shaft and moving the ratchet wheel away from the arm 64. The arm 64 may then be rotated independently of the ratchet wheel by turning a knob 73 to which said arm 64 is secured. The position of the arm 64 is indicated by a pointer 74 fixed to the knob 73 and adapted to move around a graduated dial 75, (Fig. I). When the arm 64 is adjusted, the pointer indicates the number of tags to be printed, and during the printing operations, the arm 64 moves step by step toward the abutment 62 at the rear end of the feeder carrier. When the member 63 carried by the arm 64 steps into the path of the abutment 62, the knife is actuated to sever the tag strip. The member 63 is slidably mounted in the end of the arm 64, and is normally held in the position shown by a spring 76.

The pivoted knife holder 52 may be adjusted to accurately position the knife 51 by adjusting nuts 77 on a rod 78 passing through an arm 79 on the pivoted knife

holder. After the tag strip has been severed, the operating handle is rotated to complete the feeding and printing operations and the completely printed strip is finally discharged at the front end of the machine. Before beginning another printing operation, the blank strip must be fed forwardly by hand to a point where it will be picked up by the feeder 28' at the rear end of the machine.

The inking ribbon mechanism.—The inking ribbon passes under suitable guide bars below the banks of type wheels, and is connected to winding spools 80, see Figs. II, VIII and IX. The winding spools are rotated step by step during the operation of the power shaft to wind the ribbon onto one of the spools and unwind it from the other spool. When the ribbon is completely unwound from one of the spools, a tripping device, carried by the ribbon, is brought into service to reverse the direction of feed.

The ribbon spools 80 are secured to shafts 81 journaled in the side frames 2, and each ribbon spool is provided with slotted end flanges that receive a tripping device 82. The tripping devices 82 are rods secured to the ends of the ribbon and passing through the slots 83 in the spool flanges. These tripping devices lie at the inner ends of the slots 83 when the ribbon is wrapped on a spool, and they are pulled away from the axis of the ribbon spool to trip certain devices, and thereby reverse the direction of feed, when the ribbon is completely unwound from said spool.

The ribbon is fed through the medium of ratchet wheels 84 fixed to the shafts 81 and adapted to be driven by pawls 85. The pawls are pivoted to bell crank levers 86 having long arms 87 which lie in the path of movement of pins 88, (Fig. III), on the reciprocating tag feeder carrier 26. Springs 89 tend to hold the arms 87 engaged with lugs 90 on one of the side frames 2. Both bell crank levers 86 and the pawls carried thereby are rocked by the pins 88 during the operation of the reciprocating feeder carrier.

The pawls 85 on the bell crank levers are connected to each other by a connecting member 91 pivoted to the upper ends of said pawls. One of the pawls is always engaged with a ratchet wheel 84, and the other pawl is held out of engagement with the ratchet wheel adjacent to it by the connecting member 91. The pawls are held in the position seen in Fig. VIII by their own weight combined with the weight of the connecting member 91. If the inoperative pawl at the left hand side of Fig. VIII is thrown into engagement with the adjacent ratchet wheel, the other pawl will be thrown out of engagement with its ratchet wheel by the connecting member 91, and the pawls will be held

in this latter position by the weight just referred to. Each pawl has a tripable arm 92 adapted to be operated by a tripping device 82 when the ribbon is unwound from the spool to which said tripping device is fitted. The action of either tripping device is to carry the arm 92 operable thereby away from the axis of the spool to overthrow the pawls and reverse the feed, thereby causing the ribbon to wind onto the unwound spool.

I claim:—

1. In a printing machine, printing devices, and means for pushing sheets step by step to said printing devices, said means comprising a reciprocating carrier, a sheet pusher carried by said carrier, a tripable member carried by said carrier for holding said pusher in operative position, means supported independently of said carrier with which said tripable member engages to cause said pusher to be freed when said carrier and pusher have partaken of a predetermined degree of movement in one direction, and means for restoring said pusher to sheet feeding position and into engagement with said tripable member when said carrier is moved in a reverse direction.

2. In a printing machine, printing devices, and means for pushing sheets step by step to said printing devices; said means comprising a reciprocating carrier, a sheet pusher carried by said carrier, a tripable member carried by said carrier for holding said pusher in operative position, means supported independently of said carrier with which said tripable member engages to cause said pusher to be freed when said carrier and pusher have partaken of a predetermined degree of movement in one direction, and an abutment in the path of backward travel of said pusher whereby said pusher is restored to sheet feeding position and to engagement with said tripable member during the reverse movement of said carrier.

3. In a printing machine, a frame, printing devices supported by said frame, and means for pushing sheets step by step to said printing devices; said means comprising a reciprocating carrier, a pivotally mounted pusher carried by said carrier, a tripable member by which said pusher is held in sheet feeding position, an abutment supported by said frame adapted to be engaged by said tripable member to release said pusher, and an abutment supported by said frame back of said pusher whereby the pusher is moved into sheet feeding position and into engagement with said tripable member.

4. In a printing machine, printing devices, means for feeding sheets to said printing devices, the feeding means comprising a carrier, a feeder movable into and out of engagement with the sheets, said feeder be-

ing pivoted to said carrier, a yieldable device tending to move said feeder away from the sheets, a dog on said carrier holding said feeder engaged with the sheets, means for tripping said dog at a predetermined point to release the feeder and allow said yieldable device to move the feeder away from the sheets, and means for restoring said feeder.

5. In a printing machine, printing devices, means for feeding sheets to said printing devices, said feeding means comprising a carrier, means for reciprocating said carrier, a feeder movable into and out of engagement with the sheets, said feeder being pivoted to said carrier, a yieldable device tending to move said feeder away from the sheets, a dog pivoted to said carrier for holding said feeder engaged with the sheets, a stationary abutment adapted to be engaged by said pivoted dog to release said feeder at a predetermined point so as to allow said yieldable device to move the feeder away from the sheets, and a second stationary abutment adapted to be engaged by said feeder to restore it to its feeding position.

6. In a printing machine, printing devices, and means for pushing sheets step by step to said printing devices; said means comprising a carrier, means for reciprocating said carrier, a pusher movable into and out of engagement with the sheets, said pusher being carried by said carrier, a locking device adapted to automatically lock the pusher, when the latter occupies its feeding position, an abutment adapted to be engaged by said locking device during the forward movement of said carrier to unlock the pusher and stop the feed at a predetermined point, and a stationary abutment adapted to be engaged by the pusher during the rearward movement of said carrier to restore the pusher to its feeding position.

7. In a printing machine, a plurality of printing devices spaced from each other, a feeder for feeding sheets first to one and then another of said printing devices, a carrier for said feeder, means for reciprocating said carrier, a platen adjacent to each printing device, and means operable by said carrier for moving said platens toward said printing devices.

8. In a printing machine, a plurality of printing devices spaced from each other, a feeder for feeding sheets first to one and then another of said printing devices, a carrier for said feeder, means for reciprocating said carrier, a platen adjacent to each printing device, and means secured to said carrier for moving said platens toward said printing devices.

9. In a printing machine, a plurality of printing devices spaced from each other, a feeder for feeding sheets first to one and then another of said printing devices, a car-

rier for said feeder, means for reciprocating said carrier, a platen adjacent to each printing device, and cams on said carrier for moving said platen toward said printing devices.

10. In a printing machine, a plurality of printing devices spaced from each other, a feeder for moving sheets step by step first to one and then another of said printing devices, a carrier for said feeder, a platen carrier provided with rollers arranged upon said feeder carrier, platens supported by said platen carrier arranged beneath the several printing devices, and means carried by said feeder carrier coöperable with said rollers to elevate the platen carrier and platens toward said printing devices.

11. In a printing machine, a plurality of printing devices spaced from each other, a feeder for moving sheets step by step first to one and then another of said printing devices, a carrier for said feeder, a platen carrier provided with rollers arranged upon said feeder carrier, platens supported by said platen carrier arranged beneath the several printing devices, and cams on said feeder carrier coöperable with the platen carrier rollers to elevate the platen carrier and platens toward said printing devices.

12. In a printing machine, a frame, a plurality of printing devices supported by said frame and spaced from each other, a sheet feeding device comprising a carrier, and a feeder carried by said carrier by which the sheets are fed step by step, means for reciprocating said feeder carrier, a platen carrier swingingly connected to said frame, platens carried by said platen carrier and arranged beneath said printing devices, and means carried by said feeder carrier for moving said platen carrier and platens toward said printing devices.

13. A machine of the character described

comprising a plurality of printing devices, a platen bar adjacent to each printing device, a movable support for said platen bars, the ends of said platen bars being adjustably fitted to said support, springs interposed between said platen bars and said support, links pivoted to said support to guide it in its movement, and a cam for elevating said support.

14. A machine of the character described, comprising a printing device, means for feeding a strip step by step to said printing device, a shaft for actuating said parts, an abutment movable by said shaft, a cutter for severing said strip, a transmission member normally located out of the path of said abutment, an adjustable arm adapted to move said transmission member in the path of movement of said abutment, means for moving said adjustable arm step by step in unison with said feeding means to cause the transmission member to transmit the movement of said abutment to the cutter after a predetermined number of step by step movements, and an indicator showing the position of said arm.

15. A machine of the character described comprising a printing device, means for feeding a strip step by step to said printing device, a shaft for actuating said parts, an abutment movable by said shaft, a cutter for severing said strip, means for causing said cutter to partake of the movement of said abutment after a predetermined number of feeding operations, the last named means including a traveler movable by said shaft, means under control of the operator for adjusting said traveler, and an indicator showing the position of said traveler.

ALBERT J. McCAULEY.

In the presence of—

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