

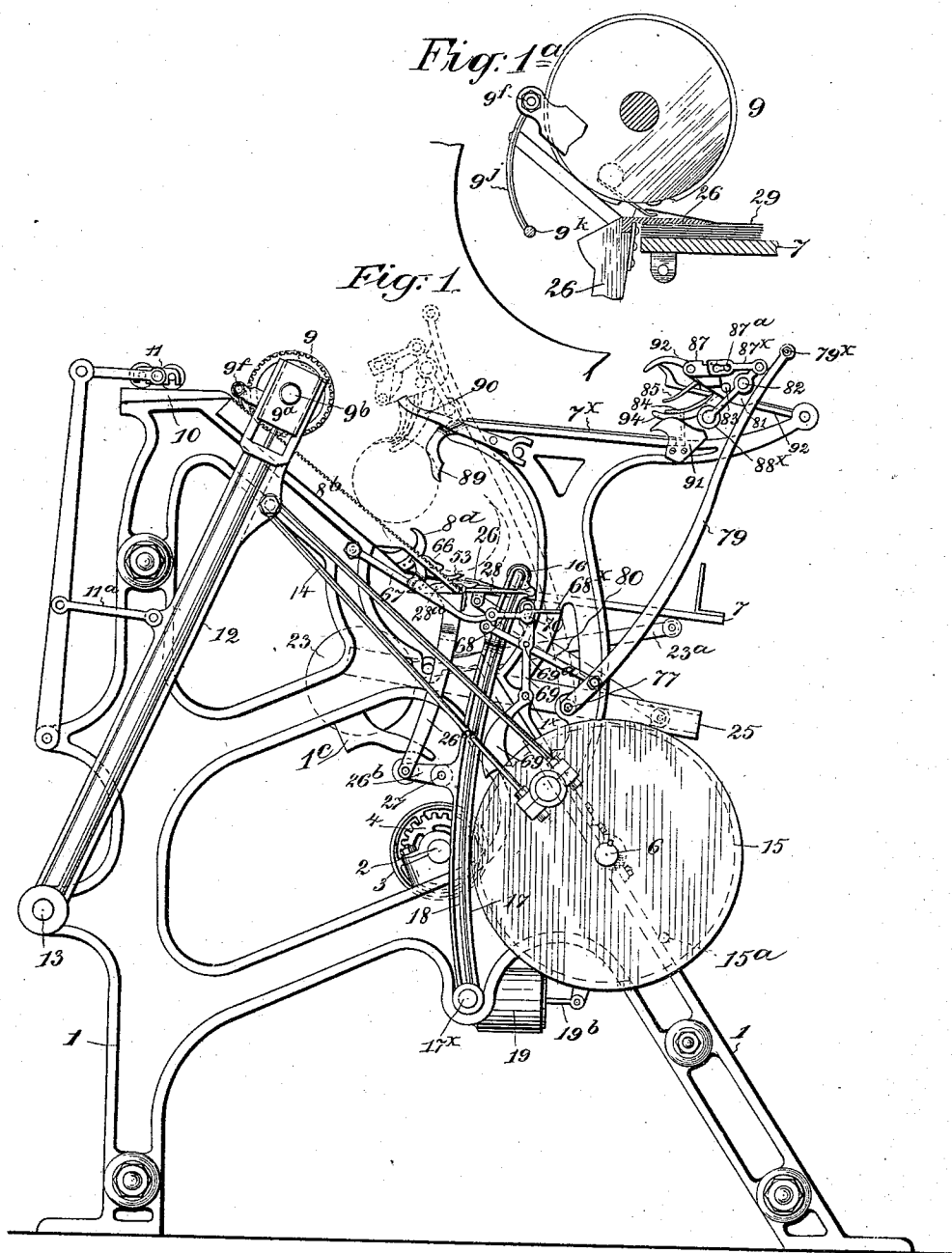
(No Model.)

12 Sheets—Sheet 1.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.



Witnesses:-

R. H. Haywood

F. W. Winman

Inventor:-

George R. Clarke

by *Henry G. Gurnett*
his Attorney

(No Model.)

12 Sheets—Sheet 2.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.

Fig. 2^a

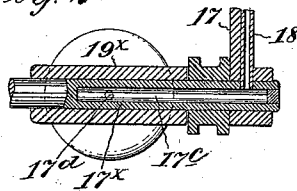


Fig. 2^b

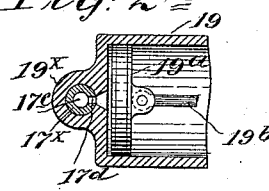
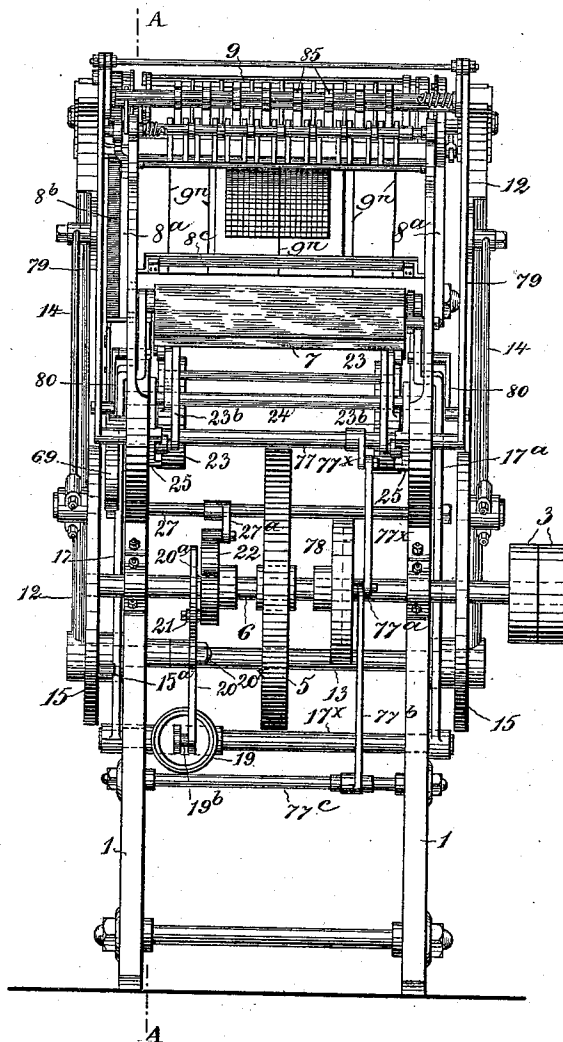


Fig. 2.



Witnesses:-
O. H. Kaywood
J. W. Wiman

Inventor:-
George R. Clarke
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(No Model.)

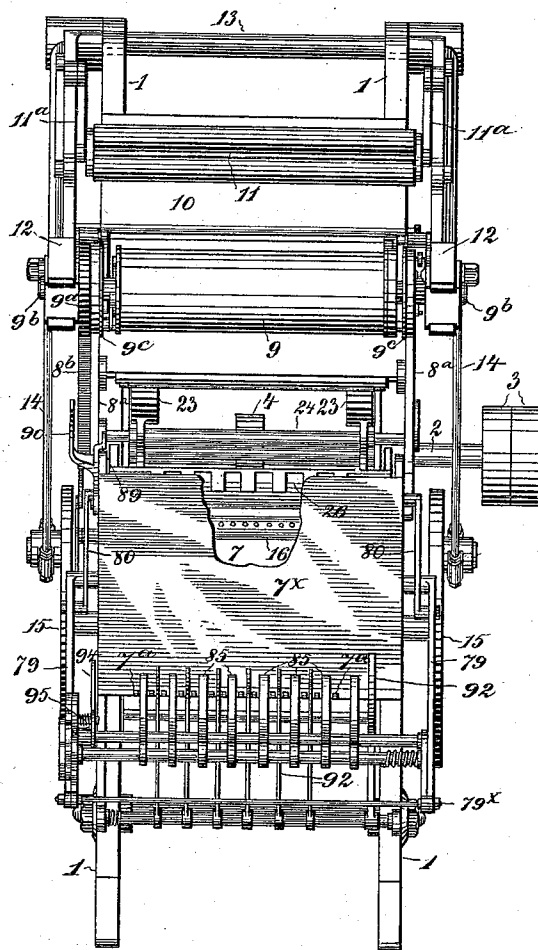
12 Sheets—Sheet 3.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.

Fig. 3



Witnesses:-

C. H. Maybrook
J. M. M. M. M.

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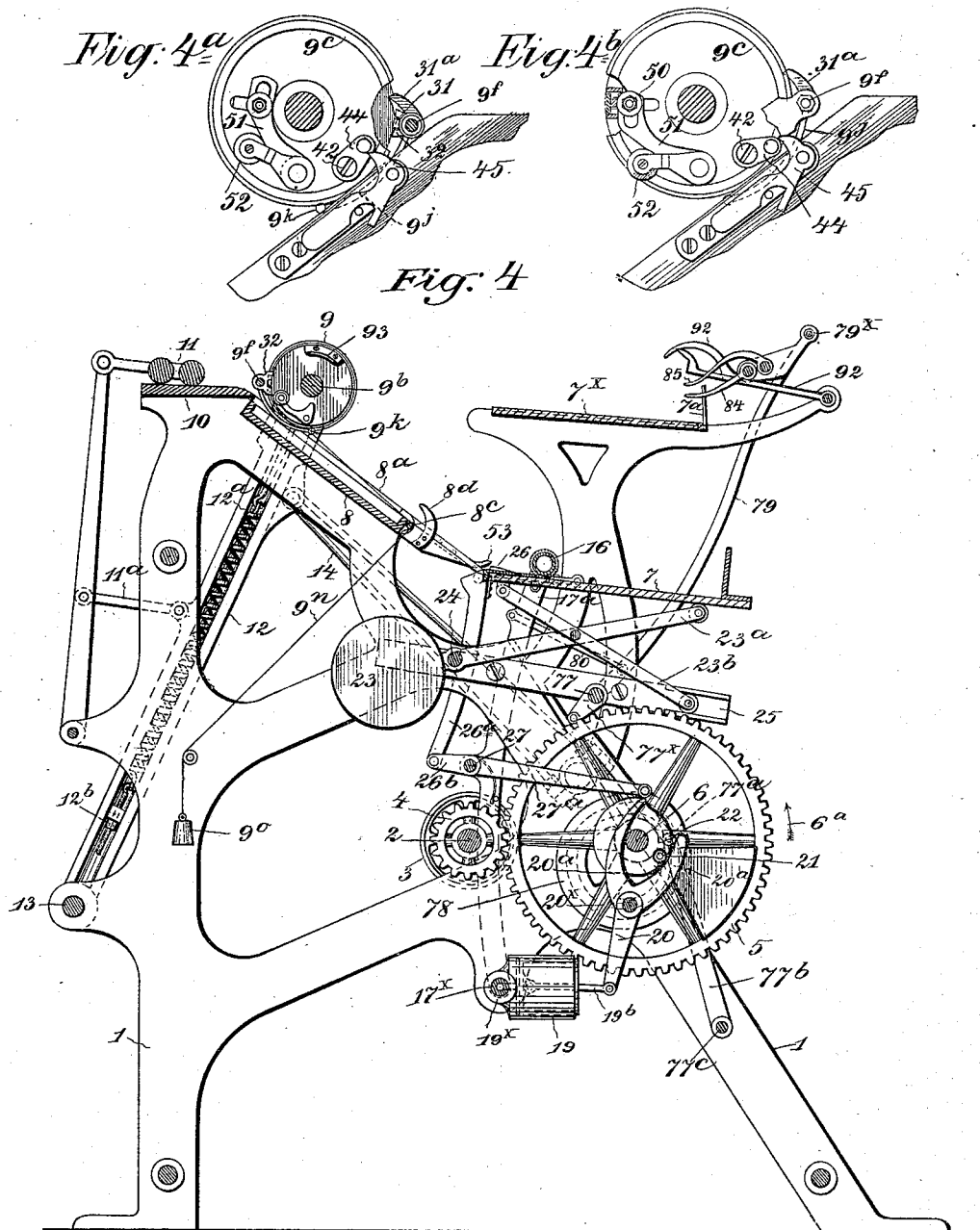
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12 Sheets—Sheet 4.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.



Witnesses:-

R. H. Haywood
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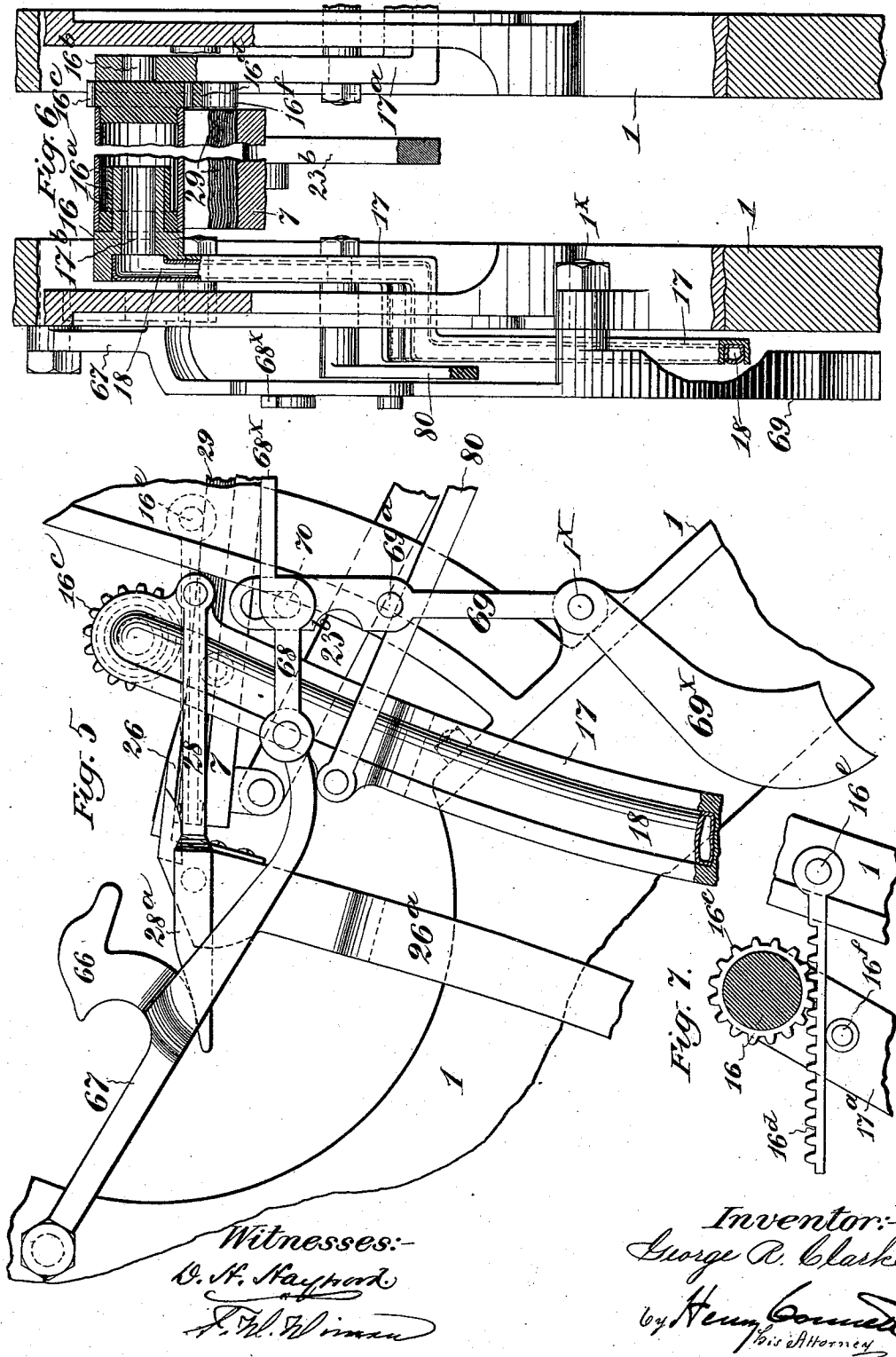
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12 Sheets—Sheet 5.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.



Witnesses:
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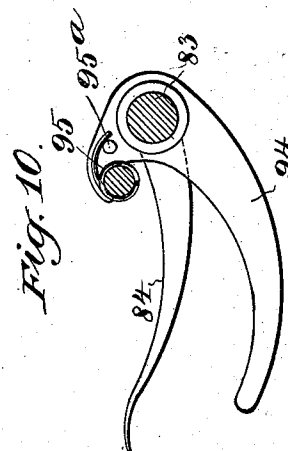
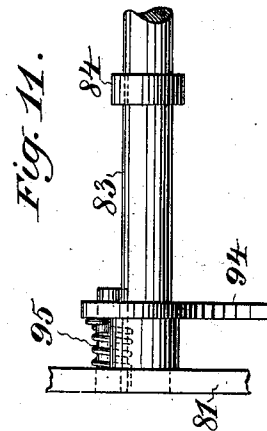
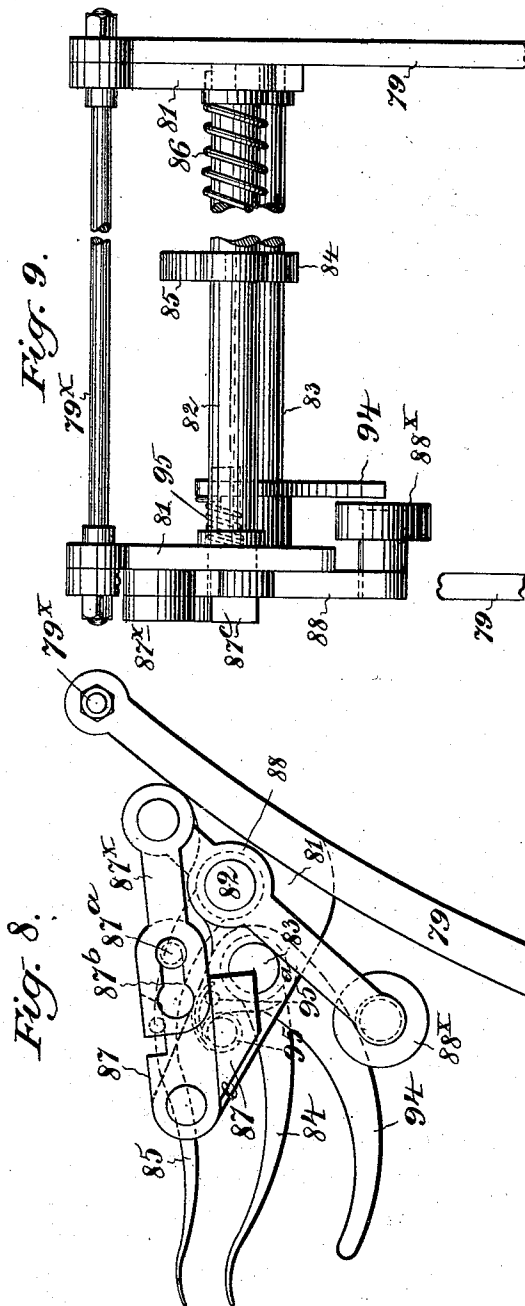
(No Model.)

12 Sheets—Sheet 6.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.



Witnesses:

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G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.

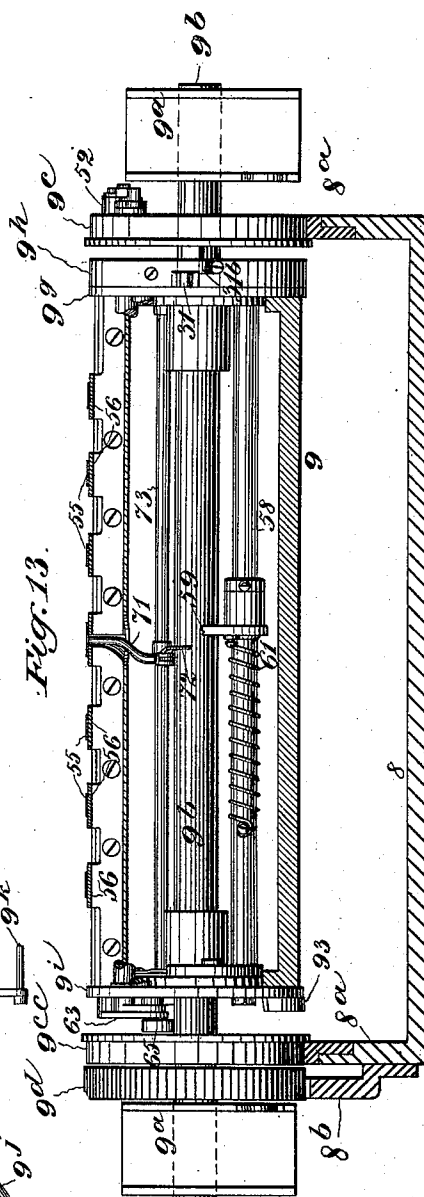
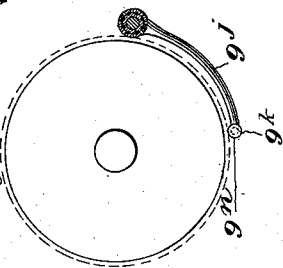


Fig. 12.

Fig. 13.

Fig: 13^b_{31a}

Witnesses:-
H. H. Kayport.
 J. W. Thiman

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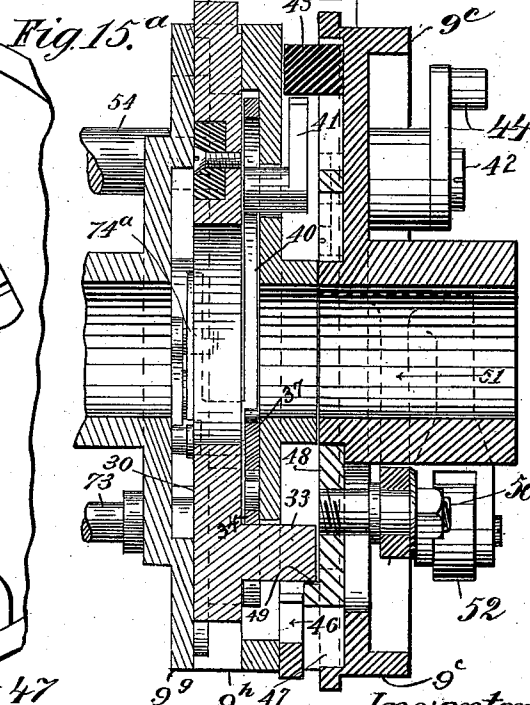
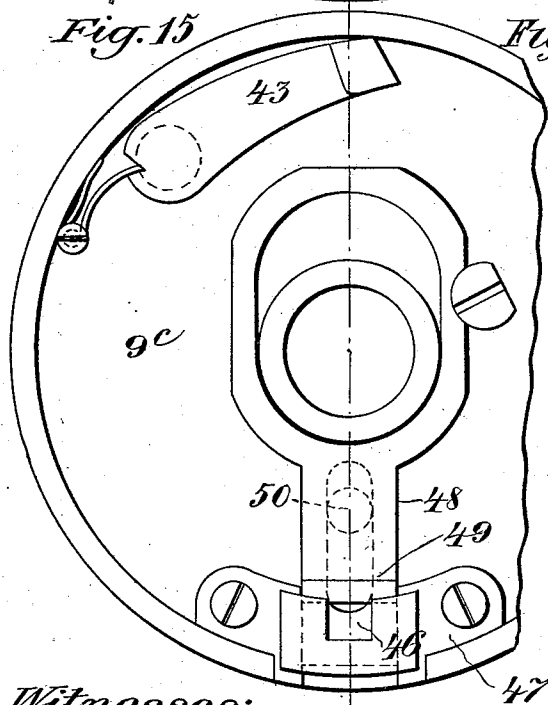
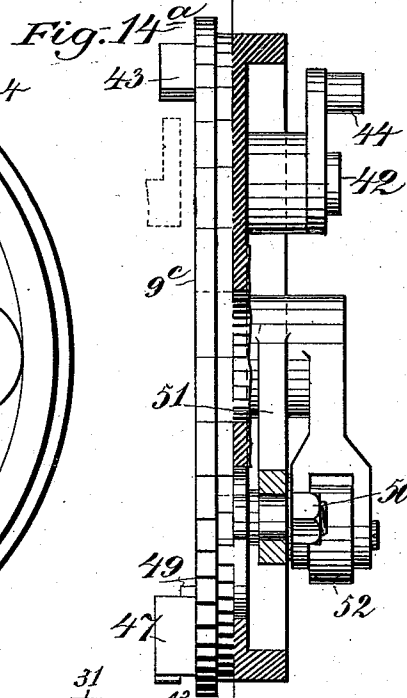
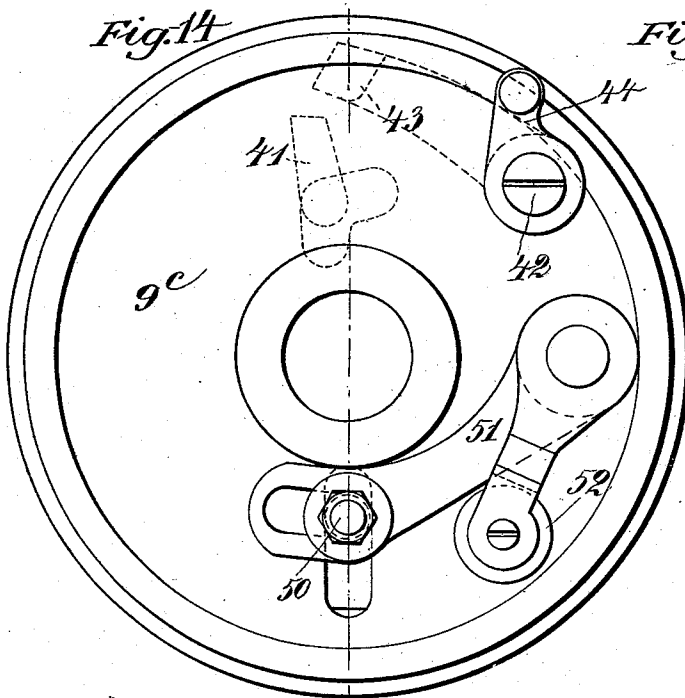
(No Model.)

12 Sheets—Sheet 8.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.



Witnesses:-

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12 Sheets—Sheet 9.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.

Fig. 16.

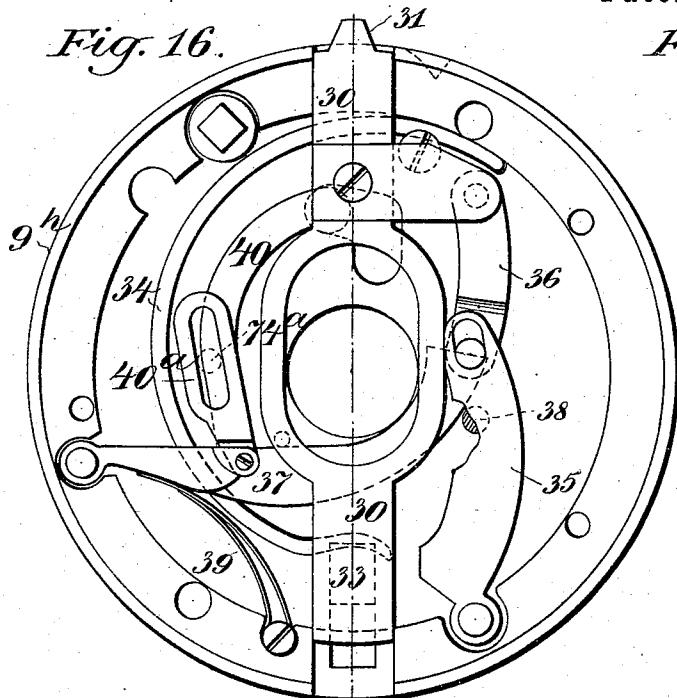


Fig. 16

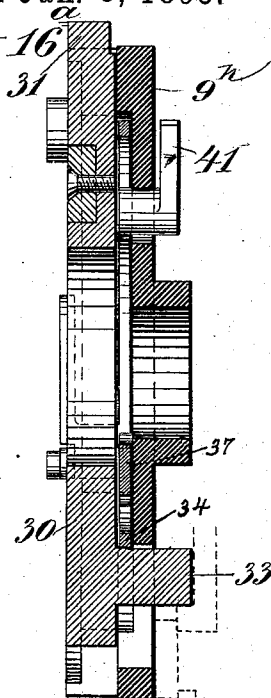
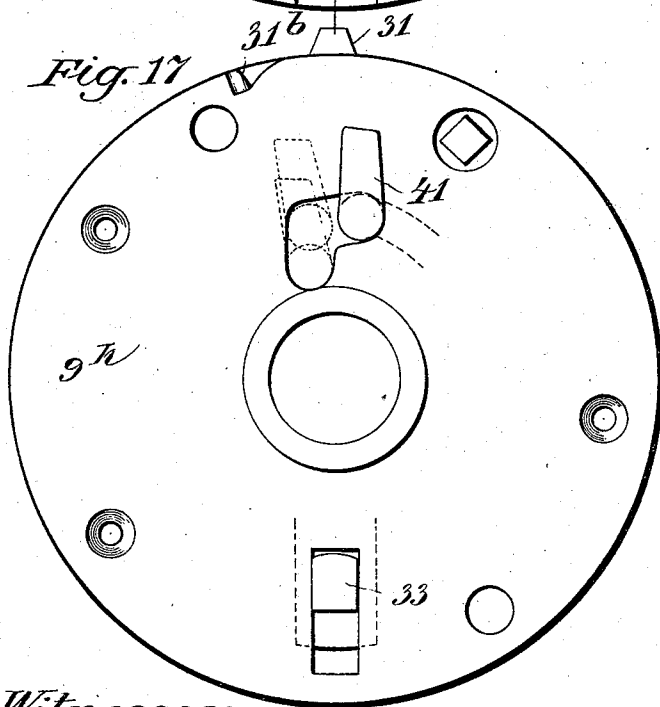


Fig. 17



Witnesses:-

W. H. Hayworth

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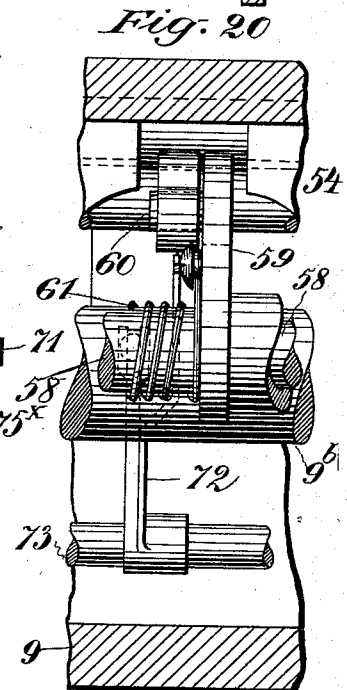
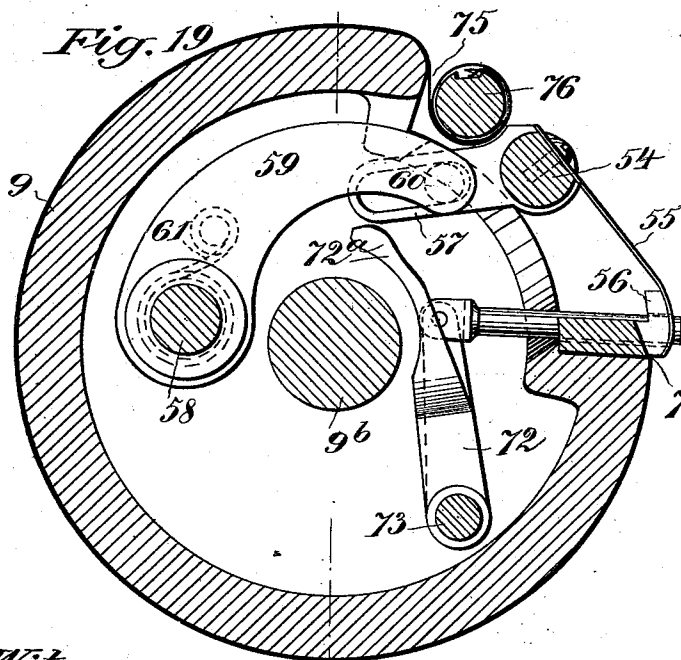
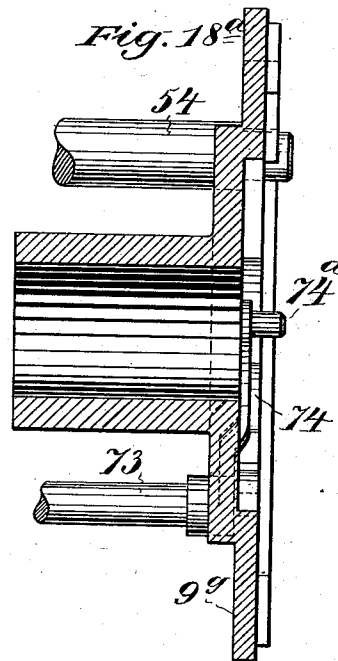
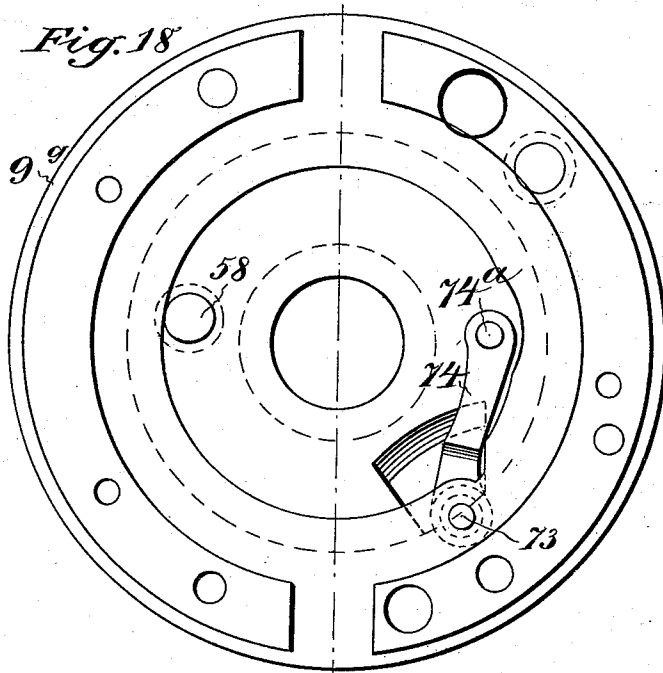
(No Model.)

12 Sheets—Sheet 10.

G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.



Witnesses:-

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F. W. Winan

Inventor:-
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G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.

Fig. 21

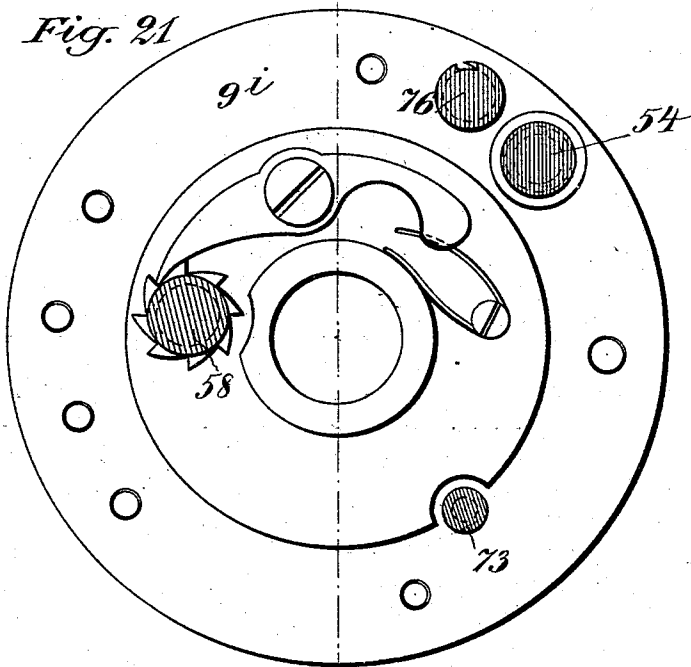


Fig. 21a

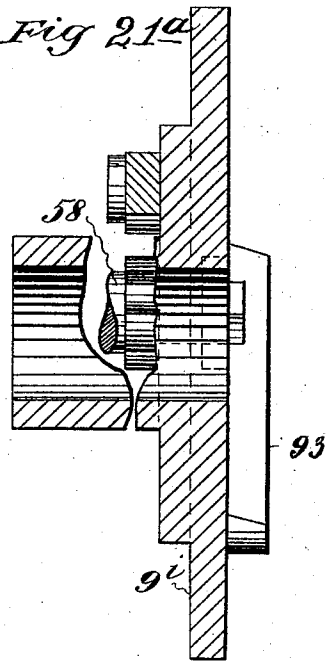


Fig. 22

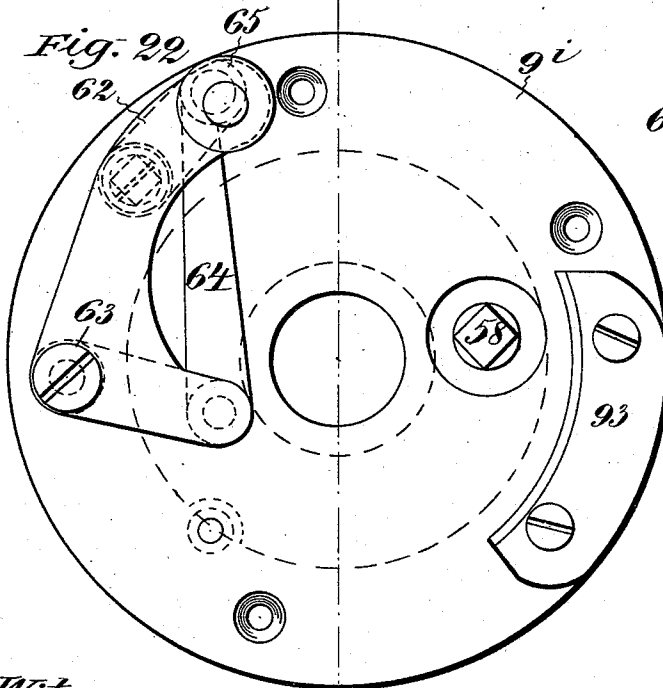
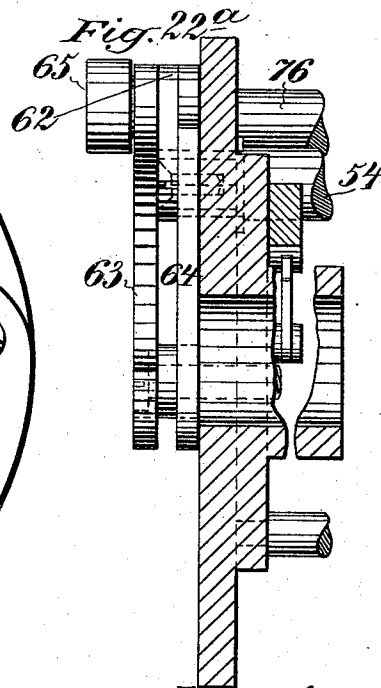


Fig. 22a



Witnesses:-

R. F. Rayport
J. W. Wiman

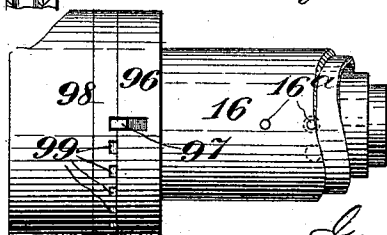
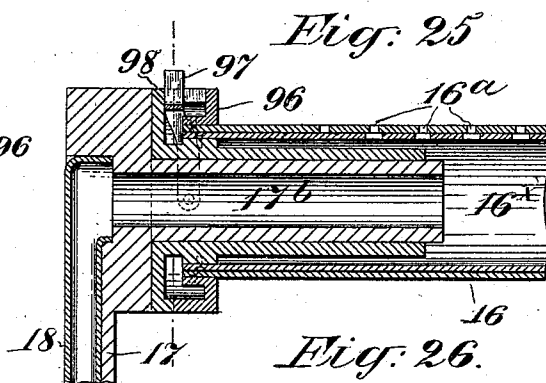
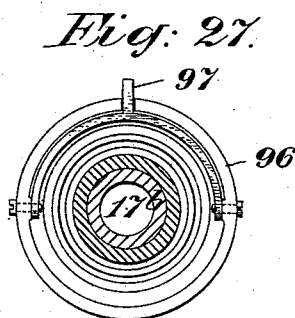
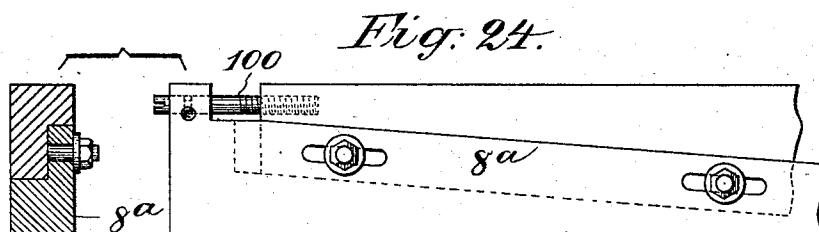
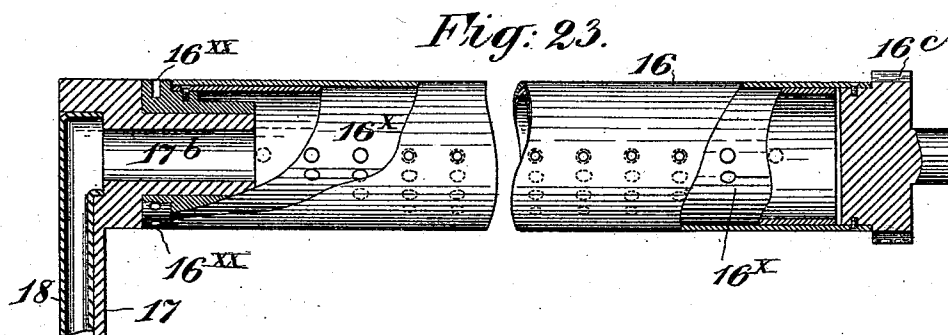
Inventor:-

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G. R. CLARKE.
PRINTING MACHINE.

No. 532,193.

Patented Jan. 8, 1895.



Witnesses:

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J. W. Himes

Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE R. CLARKE, OF MONTELL, TEXAS.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 532,193, dated January 8, 1895.

Application filed March 22, 1894. Serial No. 504,584. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. CLARKE, a citizen of the United States, residing at Montell, in the county of Uvalde and State of Texas, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

This invention relates to a self-feeding and self-delivering printing machine which prints sheets and not webs; and its characteristic features are these, viz: The type-bed is stationary and an impression cylinder, with a flattened face and a gripper, moves to and fro over the form of type. The blank sheets of paper on the sheet-platform are segregated, one-by-one, by a pneumatic-mechanical "feeder" and presented to the gripper on the cylinder. The latter moves back over the form, carrying the gripped sheet which is held up out of contact with the types by a sheet-guard. In making this backward movement the cylinder does not rotate, being locked to its carrying-frame with its flattened face down or next the type. On its forward, printing movement the cylinder rolls over the form, the sheet of paper being interposed and receiving the impression. When the gripper arrives at the upper side of the cylinder (the latter rolling forward) a vibrating delivery gripper moves backward, and interposing its open jaws between the closed jaws of the cylinder gripper, seizes the edge of the printed sheet at the moment the latter gripper opens its jaws and releases the sheet. The cylinder continues to rotate forward and the delivery gripper moves forward at a speed corresponding with the peripheral speed of the cylinder, thus carrying the printed sheet forward and depositing it on an upper, delivery platform. After the cylinder has completed one rotation, it is again locked to its frame, the gripper thereon is opened, and the cylinder moves a little farther forward so that its jaws may take under the uplifted edge of the segregated, topmost sheet on the pile on the sheet-platform. This sheet is then seized and borne back as before described. The cylinder is mounted on an arbor provided with track wheels which run or roll on track-rails on the type-bed, which rails are, by preference, made adjustable so as to regulate the impression. These cylinder wheels roll back and forth, and to compel them to roll, a toothed

wheel is fixed on the cylinder arbor and arranged to gear with a rack secured to the type-bed or the frame. The cylinder is drawn down by springs to provide pressure for printing, and suitable inking mechanism is provided to ink the form of type.

The mechanism for locking the cylinder alternately to its frame (to prevent its rotation) and to its wheels (to compel it to rotate), is carried by the cylinder and its wheels, as is also the gripper-operating mechanism. These mechanisms are actuated by cams mounted on the machine. In case, for any reason, the cylinder gripper does not seize a sheet, the cylinder remains locked against rotation and does not roll over the inked types. This prevents the inking of the cloth or paper which covers the cylinder.

The annexed drawings illustrate an embodiment of the invention.

Figure 1, is an elevation of the left-hand side of the machine. Fig. 2 is a front elevation. Fig. 3 is a plan, and Fig. 4 is a vertical section on line A A, Fig. 2. These are general views. Fig. 1^a is a detail view showing the cylinder taking a sheet. Figs. 2^a and 2^b are sectional detail views of the air-exhausting device of the feeder. Figs. 4^a and 4^b are detail views showing the operation of unlocking the cylinder from its frame. Figs. 5, 6 and 7 are detail views illustrating the feeding mechanism for the blank sheets. Figs. 8, 9, 10 and 11 are detail views of the delivery-gripper. Figs. 12 and 13 are, respectively, a side elevation and longitudinal section of the cylinder, detached, and Figs. 13^a and 13^b are detail views of the sheet-guard. Figs. 14 to 22^a are enlarged detail views of the mechanisms carried by the cylinder and its wheels. Figs. 23, 25, 26 and 27 illustrate forms of the suction roller of the blank sheet feeder, and Fig. 24 illustrates a means for regulating the impression in printing.

General Description.

1 is the frame of the machine, in general. 2 is the driving shaft. 3 are the tight-and-loose driving pulleys on said shaft. 4 is a pinion on the shaft 2, gearing with a spur wheel, 5, on a cam-shaft, 6. This cam-shaft rotates in the direction indicated by arrows 6^a. 7 is the platform for the pile of blank sheets,

and 7^x is the platform for the pile of printed sheets.

8 is the type-bed, which supports the form of type.

5 9 is the impression cylinder and its attachments.

10 is the ink-distributing platform, and 11 are the inking rollers. This inking apparatus may be of any kind.

10 The arbor, 9^b, of the cylinder 9, has bearings in blocks, 9^a, mounted in guides in the upper ends of two arms, 12, on a rock-shaft, 13. These arms are coupled by connecting-rods, 14, to pins in crank-disks, 15, on the cam-shaft 6. The inking rollers are coupled by links, 11^a, to the arms 12.

Feeding Mechanism.

Extending across the platform 7, is the hollow suction-roller, 16 (see Fig. 6), which has in it a row of holes, 16^a. This roller is mounted rotatively in two vibrating arms, 17 and 17^a, on a rock-shaft, 17^x. The roller 16, has a bearing at one end on a hollow journal, 17^b, on the arm 17, and this hollow journal communicates with a tube, 18, which extends down along the arm 17, to the shaft, 17^x, and connects with a bore, 17^c, in same (see Figs. 2^a and 2^b). The air-exhauster comprises a cylinder, 19, fixed to shaft 17^x, by a sleeve, 19^x, where there is a hole, 17^d. A piston, 19^a, in the cylinder is coupled by a rod, 19^b, to the arm of a lever, 20 (Fig. 4), fulcrumed at 20^x. This lever has two arms, 20^a, adapted to be acted on alternately by a stud, 21, in a cam, 22. This stud rocks the lever, moves the piston and alternately exhausts the air from the suction-roller 16. This roller 16, is provided at one end (Fig. 6) with a pinion, 16^c, which gears with a rack, 16^d, pivoted at 16^e (Fig. 7). The rack is supported on a roller-stud, 16^f, in the arm 17^a. The platform 7, is kept pressed up to the suction-roller 16, with a yielding pressure by a device seen in Fig. 4. A weight, 23, is secured to a lever, 23^a, fulcrumed on a rod, 24, its longer arm taking under the front part of the platform 7. Crossing the lever 23^a, is a lever, 23^b, which is pivoted to lever 23^a; this lever 23^b, which is pivoted to the platform 7, and has a roller-stud at its lower end engaging a guide-track, 25, on the frame. There should be two of these yielding supports, one at each side of the platform.

55 The arms 17 and 17^a, which carry the suction-roller 16, vibrate in unison with the arms, 79, which carry the delivery gripper (to be hereinafter described), being coupled thereto by links, 80. When the suction-roller 60 16, is over the rear edge of the pile of blank sheets on the platform 7, the holes 16^a, will be down on the topmost sheet. The air is now exhausted from the roller and it starts to roll forward (to the right in Figs. 1, 2, and 5) 65 thus lifting the edge of this sheet. A segregating blade, 26, coupled to the roller-arms by links, 28, and vibrating with the roller,

now advances under the uplifted edge of the sheet and the vacuum being then broken the sheet falls on the elevated back of the blade 26. This back is transversely grooved, 70 as seen in Fig. 3 to allow the teeth of the cylinder gripper to pass under the sheet, and at this moment the non-rotating cylinder, with the gripper open, advances to the position 75 seen in Fig. 1^a. The gripper closes on the sheet, and the cylinder moves back.

To permit the cylinder to draw out the seized sheet from under the suction roller 16, the blade 26, presses down a little the platform 7, and the pile of sheets thereon. This is effected by the following described means: The blade 26, is secured to arms, 26^a, and these arms are coupled at their lower ends to arms, 26^b, on a rock-shaft, 27, mounted in the arms 17 and 17^a. This shaft has an arm, 27^a, which carries a stud that bears on the periphery of the cam 22 (see Fig. 4), beforementioned. This cam is so formed and set as to actuate the blade 26, to the proper extent and at the proper time. When the blade draws 90 back it just frees the pile of sheets.

Cylinder and its Locking Mechanism.

These devices will be described with special reference to Figs. 12 to 22^a. The arbor 9^b, of the impression cylinder has rotative bearings in blocks 9^a, in guides in the upper ends of the arms 12, and these blocks are secured to springs, 12^a (Fig. 4), in the arms. 100 These springs have tension-regulating nuts, 12^b. On the arbor 9^b, are fixed the cylinder wheels, 9^c and 9^c, which run on track-rails, 8^a, on the type-bed. The toothed wheel, 9^d, on the arbor gears with a rack, 8^b, on the type-bed. The cylinder-frame comprises two arms, 9^e, on the blocks 9^a, and a rod or bar, 9^f, connecting said arms. The cylinder 9, may be locked to this frame against rotation, or it may be locked to one of its wheels to compel 110 rotation. It is always locked to one or the other of these parts. The mechanism for locking the cylinder is best seen in Figs. 14 to 17, inclusive.

9^g is a cap-plate on the cylinder and 9^h is a box-plate secured to plate 9^g. Fig. 16 shows the inner face of plate 9^h, and Fig. 17 its outer face. Figs. 14 to 15^a show the wheel 9^c, adjacent to the box-plate 9^h. Fig. 14 shows the outer face, and Fig. 15 the inner face of said 120 wheel.

In the box-plate 9^h (Fig. 16), is mounted a double bolt, 30, the tip, 31, of which is adapted to enter a socket, 32 (see Fig. 4^a), in the cylinder frame, while at its other end it has a laterally projecting stud, 33, which projects through a slot in the plate 9^h, and may engage a keeper-notch, 46, in a plate, 47, on the inner face of the wheel 9^c, (Figs. 15 and 15^a). A spring, 34, bears on the stud 33, and tends to withdraw the tip 31, from its socket 32. When 130 the bolt 30, is moved to lock the cylinder to its frame, the bolt is held fast by a toggle of two links, 35 and 36, having a slotted con-

nection at the knuckle. The knuckle is "broken" outwardly by a curved cam-bar, 37, pivoted on the plate and its curved face bearing on a stud, 38, on the toggle-link 35.

5 The cam-bar is upheld by a spring, 39, and it is actuated by the following described mechanism: An arm, 40, is pivoted to the cam-bar 37, and said arm has a stud, 41, which projects through a slot in plate 9^h, toward the wheel 9^c. In this wheel is mounted a rock-shaft, 42, on the outer end of which is a crank, 44, and on its inner end is fixed an arm, 43. Seen in Fig. 15. As the wheel rolls on its track the crank 44, strikes a cam, 45 (see Figs. 15 4^a and 4^b), the shaft 42, is rocked thereby and the arm 43, strikes the stud 41, and through it, actuates the toggle and sets free the bolt 30. Then the spring shoots the bolt back and the stud 33, enters the notch, 46, and locks the cylinder to the wheel 9^c. To shift the bolt 30, in the opposite direction so as to lock the cylinder to its frame and unlock it from wheel 9^c, the following described mechanism is provided. Mounted on the inner face of wheel 9^c, is a slide, 48, the outer end of which plays in the keeper-plate, 47, back of notch 46, and has a shoulder, 49 (Fig. 15^a). On the slide 48, is a stud, 50, which plays in a slot in wheel 9^c, and on the outer face of said wheel is pivoted an elbow-lever, 51, one arm of which is coupled to the stud 50 (Fig. 15), and the other carries a roller, 52. This roller strikes a cam, 53, on the frame when the cylinder has made a complete rotation forward and thus drives the slide 48, inward radially on the wheel 9^c. The shoulder 49, on the slide takes behind the stud 33, and shifts the bolt 30, until its tip 31, enters the socket on the frame, the toggle then straightening out and holding the bolt 30, in this position as before described. Adjacent to the tip 31, of the bolt is a notch, 31^b, in the edge of the plate on the cylinder, and on the bar 9^f, is mounted a spring pawl, 31^a, to engage the notch in the cylinder and prevent any backward rotation of the cylinder beyond this point. Fig. 4^a shows this pawl engaged.

The devices for opening and closing the cylinder gripper are at that end of the cylinder where wheel 9^c, is situated. The gripper and its operative mechanism are best illustrated in Figs. 12, 13, 19, 20, 21 and 22. In Fig. 20 the mechanism within the middle part of the cylinder is seen as if viewed from the left in Fig. 19.

55 The cylinder 9, is hollow and has a flattened and recessed face wherein is mounted a rock-shaft, 54, carrying the spaced gripper teeth, 55, which close on seats, 56, at the margin of the recess. The gripper is held closed by spring pressure through mechanism seen in Figs. 19 and 20. On the gripper-shaft 54, is a slotted arm, 57, and on a bar, 58, mounted in the end-plates of the cylinder, is a rocking arm, 59, coupled by a slot and stud, 60, to the arm 57. On the bar 58, is a coil spring, 61, attached at its respective ends to the bar and

arm. The spring holds the gripper closed. The tension of spring 61, may be increased by rotating bar 58, the bar being held against back rotation by a pawl and ratchet in a well known manner.

The gripper is opened by rocking the shaft 54, through mechanism illustrated in Figs. 22 and 22^a. On the outer face of the cap-plate, 9ⁱ, of the cylinder is a crank, 62, on the end of shaft 54, and on the said cap-plate is pivoted an elbow-lever, 63, the shorter arm of which is coupled to the crank 62, by a link, 64. On the longer arm of lever 63, is a roller, 65. When this roller is pressed inward radially by a cam 89 on the frame, the gripper is opened. This lever-and-crank device effects the opening of the gripper by an easy movement.

When the cylinder 9, has rolled forward until the gripper is at the delivery point, as seen in dotted lines in Fig. 1, the gripper is opened by the roller 65, impinging on a cam, 89, placed in the proper position on some part of the frame; and when the cylinder has completed its rotation said roller 65, impinges on a shifting-cam, 66. Seen best in Figs. 1 and 5. This cam is first elevated so as to act on the gripper mechanism, and then lowered so as not to open the gripper when the cylinder 9, moves back. The cam 66, is carried by a swinging arm, 67, and is upheld by a wedge, 28^a, on the link 28. As the suction-roller 16, moves back this wedge moves under cam 66, and elevates it into operative position, it being held in this position by a toggle composed of links, 68 and 69, the latter pivoted at 1^x. When the toggle is straightened, a prolongation, 68^x, on link 68, impinges on a stud, 69^a, on link 69. The straightening of the toggle throws an arm, 69^x, on link 69, in the path of a stud, 15^a (Fig. 1), in the crank-disk 15, and as this disk rotates the stud strikes said arm and "breaks" the knuckle of the toggle, letting the cam 66, and its arm fall by gravity as far as the wedge 28^a, will permit.

It may be said here that the cam 45 (Figs. 4^a and 4^b), will be depressed by the crank 44, when the cylinder passes said cam in moving back and the cam does not act then to unlock the cylinder. It acts at the beginning of the forward movement of the cylinder.

The Sheet Guard.

To prevent the blank sheet from being drawn over the inked faces of the type, a sheet-guard is employed, which is best seen in Figs. 4, 12, 13^a and 13^b.

On the bar or rod, 9^f, are rocking arms, 9^j, which are connected at their ends by a transverse rod, 9^k. On the bar 9^f, are springs, 9^m, which hold the arms normally as seen in Fig. 13^a. To the rod 9^k, are secured tapes, 9ⁿ, which pass over a roller, 8^c, at the front edge of the type-bed 8, and have attached to their ends (Fig. 4) light weights, 9^o, to keep them strained. When the cylinder nears the forward end of its travel, the rod 9^k, encounters

a properly situated curved deflector, 8^d, on the frame and is depressed or swung down out of the way of the gripper and the sheet to be seized, and when the cylinder moves back, this rod rises again and takes under the sheet, it and the tapes supporting the sheet slightly above the form.

Device to Prevent the Cylinder from Rolling Over the Type when no Sheet is Interposed.

This device, which is best illustrated in Figs. 13 to 20, inclusive, prevents the unlocking of the cylinder from its frame at the beginning of its forward movement unless a sheet is held in the cylinder gripper.

71 is a pin (Figs. 13, 19 and 20) which plays through a hole in a tooth or jaw of the gripper and its seat 56. This pin is coupled to an arm, 72, fixed on a rock-shaft, 73, mounted in the end-plates of the cylinder. Figs. 18 and 18^a show the end plate, 9^s, next to plate 9^h. The shaft 73, projects through plate 9^s, and has a crank, 74, the pin, 74^a, of which engages a slot in a branch, 40^a (see Fig. 16), on the arm 40, when the parts are assembled.

It will be understood that the arm 40,—of which the slotted branch 40^a forms a substantially integral part—is pivoted loosely to the bar 37, and the spring 39 does not affect its operation.

When a sheet of paper is inserted in the open gripper and the teeth close thereon, the pin 71, will not be protruded through the gripper tooth by reason of the interposed sheet, and hence, through the medium of the arm 72, rock-shaft 73, crank 74, pin 74^a, and slotted branch 40^a, the stud 41, will be held in the path of the head on the arm 43, and consequently the unlocking of the cylinder will be effected; but if there is no sheet in the gripper, the pin 71, will protrude into or through the hole in the gripper-jaw, and this will allow the stud 41, to move laterally out of the path of the head on arm 43, which will not then impinge on said stud and the unlocking of the cylinder will not be effected. In order to withdraw the pin 71, when the gripper opens to receive a sheet, the construction seen in Figs. 19 and 20 is employed. On arm 72, is a branch forming a cam, 72^a, which stands in such relation to the slotted arm 57, on the gripper-shaft that the pin 71, may move freely when the gripper is closed, as in Fig. 19, but when it is opened, arm 57, strikes cam 72^a, and draws the back pin 71.

It will be noted that when the sheet is being seized by the grippers the pin 71 will be in an upright position, its tip downward, and that it tends to fall by gravity, thus acting to rock the shaft 73, and swing the arm 40.

It may be said here that the cylinder will have an ordinary covering, 75 (Fig. 19), secured to the cylinder at 75^x, and drawn smooth and tight by a rotative straining bar 76.

Delivery Gripper for the Sheets.

This device is best illustrated in Figs. 1, 2, 3, 4, 8, 9, 10 and 11.

77 is a rock-shaft in the frame (Figs. 2 and 4), on which is an arm 77^x, and this arm is coupled to a cross-bar, 77^c, in the frame by a pair of links, 77^b, coupled together at 77^a. At 77^a is a stud which projects laterally from the pivot-point into a cam-groove in the face of the cam-disk, 78, on the cam-shaft 6. Rotation of shaft 6 rocks the shaft 77. On the outer ends of shaft 67, are long arms, 79, which project above the delivery platform 7^x, and are tied together by a rod, 79^x.

To the arm 79, as before stated, are coupled by links, 80, the arms 17 and 17^a, of the feed suction-roller 16. At their upper ends the arms 79, carry the delivery grippers. Seen in detail in Figs. 8 to 11. Two brackets, 81, are hung on rod 79^x, beside the arms 79, and these brackets are tied together by a bar, 83. On this bar are fixed at proper intervals the fixed, lower jaws, 84, of the grippers, each of which has also a movable upper jaw, 85, fixed on a rock-shaft, 82, mounted in the brackets 81. A spring, 86, about the shaft 82, near a bracket 81 (Fig. 9), serves to close the grippers which, when opened, are held open by a toggle, as seen in Fig. 8. This toggle comprises links, 87 and 87^x, pivotally connected, respectively, to a bracket 81, and to a lever, 88, on the shaft 82. At the knuckle of the toggle a stud, 87^a, in one link engages a slot 87^b, in the other. On the link 87, is a cam or block, 87^c, at its lower edge, and the lower end of arm 88, carries a roller, 88^x. When the delivery grippers move over toward the cylinder 9, to seize the edge of the printed sheet, the lower, fixed jaws 84, of the delivery grippers enter between the seats 56, and take under the edge of the sheet while the upper jaws 85, pass above or over the edge of the sheet. At this moment the cylinder gripper is opened by the impingement of the roller 85, on the cam, 89, on the frame, and simultaneously the cam or block 87^c, on the link 87, impinges on a cam, 90, on the machine frame which "breaks" the toggle upward and allows the spring 86, to instantly close the jaws of the delivery grippers on the sheet. This position of the delivery grippers is indicated in dotted lines in Fig. 1. The delivery grippers now move forward, carrying the printed sheet and moving with it at the same speed that the cylinder rolls forward and frees it, thus keeping the sheet slightly strained until it is free from the cylinder, when it is brought over the delivery platform 7^x. The roller 88^x, on the lever 88, now rides over a cam, 91, fixed on the frame, and this has the effect to rock the shaft 82, open the grippers and set the retaining toggle as represented in Fig. 8.

At the front margin of the platform 7^x, are upright pins 7^a, and the delivery gripper jaws play between these pins which serve to even the front edges of the sheets. To prevent the sheets from flying off the platform when being rapidly delivered, guards, 92, are employed. These are mounted on the frame. In order to avoid injury to the delivery grippers

by contact with the non-rotating cylinder, in case the latter should be moving forward without a sheet, the printing cylinder 9, is provided at one end with a buffet-plate, 93, and the swinging frame which carries the delivery grippers has a curved cam, 94 (Figs. 8 to 11), which impinges on this plate 93, under the conditions named and throws up the grippers by causing the brackets 81, to swing on the rod 79^x. In order to cushion the blow the cam 94, is pivoted on the rod 83, and is held against rotation about the rod by a spring, 95, on the adjacent bracket 81, which bears on a stud, 95^a, on the cam. This spring will yield if the pressure is too great.

The Suction-Roller.

Under some conditions the plain, perforated suction-roller 16, seen in Fig. 6, will serve, but in order that this roller shall work well the sheet being fed should be wide enough to cover all of the perforations, 16^a, in the series or row. To enable the machine to print narrow sheets which will not cover the end perforations of the series the construction of Fig. 23 may be employed. Within the roller 16, is fitted a tube, 16^x, which is capable of being rotated axially within the roller by inserting a pin in one of a series of holes, 16^{xx}, in a flange on the tube. In this tube are several rows of holes either of which may be brought to register with the row of holes in the roller; but each successive row of holes in the tube 16^x, is abbreviated by having one less hole at its end and in consequence by moving the inner tube far enough for the second row of holes therein to register with those in the roller 16, the two end-holes in the row in the roller will be closed or stopped out. Similarly, by turning the tube till the third series or row of holes therein is brought into play, two holes are stopped at each end of the row in the roller 16, and so on. The tube 16^x, may be rotated by inserting a pin in one of a series of holes 16^{xx}, in a flange on the tube.

In Figs. 25, 26 and 27 another form of this device is shown wherein the roller 16, has a flange, 96, in which is mounted a hinged detent, 97, and the tube 16^x, has a similar flange, 98, having in it a series of notches, 99, to receive the detent 97, and thus lock the tube and roller together in any position set. These notches are so placed that when the tube and roller are locked together, some one of the series of holes in the tube will register with the series of holes in the roller.

The impression may be regulated in any manner desired. In Fig. 24, I have shown means for raising and lowering the tracks on which the cylinder wheels roll and this serves to regulate the impression. The track has an inclined lower surface which matches an incline on the bed 8^a, and a screw, 100, serves to move the track endwise for adjustment.

The cams on the machine will have such a form and be so set as to properly effect and time the movements of the parts.

The type-bed is represented herein as inclined but this is not essential to the invention. It might be horizontal, or be inclined at a less angle than is shown.

Other means than the springs 12^a may also be used to hold the cylinder down to the type in its movements.

It will be noted that in this machine the impression cylinder is normally non-rotative, only being rotated during a part of its forward movement, or during the period of printing. At the point in its forward movement when the gripper on the cylinder reaches the under side thereof and opens, the rotation of the cylinder ceases and it remains non-rotative during the remainder of its forward movement.

Having thus described my invention, I claim—

1. A printing machine having a normally non-rotative impression cylinder which moves to and fro over the type on the type-bed, automatic means for unlocking the cylinder at the beginning of its forward movement, automatic means for compelling the cylinder to rotate during its forward printing movement, automatic means for locking the cylinder after the completion of its forward printing movement, whereby it is prevented from rotating during the latter part of its forward movement, and automatic means for operating the cylinder gripper at the proper times, as set forth.

2. A printing machine having a normally non-rotative impression cylinder, automatic means for moving said cylinder to and fro over the type on the type-bed, automatic means for compelling said cylinder to rotate during the first part of its forward movement, automatic means for arresting the rotation of the cylinder before the completion of its forward movement, automatic mechanism for operating the cylinder gripper at the proper times, automatic mechanism for feeding the sheets to the cylinder gripper, and automatic mechanism for delivering the printed sheets, as set forth.

3. In a printing machine, the combination with a type-bed, an impression cylinder, a frame in which said cylinder is carried, automatic means for moving said frame and cylinder over the type on the type-bed, automatic means for compelling said cylinder to rotate during the first part of its forward movement and automatic means for locking said cylinder against rotation during the remainder of its forward movement, of a sheet-guard connected to and moving with the frame carrying the cylinder, whereby the sheet is kept out of contact with the type while it is being placed, and a feeder which supplies sheets to the cylinder, as set forth.

4. In a printing machine, the combination with the type-bed, the vibrating frame which carries the impression cylinder to and fro over the type-bed, and the said impression cylinder, of the automatic locking and un-

locking mechanism, and the rack and pinion, which control the rotation of the cylinder, a gripper on the cylinder for seizing the sheets, and a controller, carried by the said cylinder
 5 which prevents the unlocking of the cylinder when no sheet is seized, substantially as set forth.

5. In a printing machine, the combination with an impression cylinder having a gripper, of a feeder to feed the sheets to said gripper, comprising a vibrating suction-roller, its
 10 air-exhauster, a vibrating segregating blade moving in unison with the roller and adapted to take under the top sheet when the latter is
 15 lifted by the roller, mechanism for operating said roller, air-exhauster and blade, and means for depressing said blade when in its advanced position, substantially as and for the purposes set forth.

20 6. In a printing machine, the combination with the stationary type-bed, the vibrating impression cylinder provided with a gripper, and the frame about said cylinder, of a flexible sheet-guard connected to said frame at
 25 one end and a take-up for taking up said sheet-guard when the cylinder makes its forward, printing movement, substantially as set forth.

7. In a printing machine, the combination with the type-bed, the rack 8^b, the rotatable
 30 impression cylinder, its frame, and its wheels, of means for moving said cylinder to and fro, a lock, substantially as described which locks the cylinder to its frame when its parts are in one position, and locks the cylinder to its
 35 wheels when its parts are in their other position, and means on the machine frame for operating said lock automatically, as set forth.

8. In a printing machine, the combination with a vibrating and intermittently rotating

impression cylinder, provided with a gripper, 40 and means for operating said cylinder and gripper, of a vibrating delivery-gripper for the printed sheets, said delivery-gripper comprising the fixed jaws 84, the rock-shaft 82, the
 45 movable jaws 85, fixed on said shaft, the spring 86, for closing the jaws of the gripper, the lever 88, on the shaft 82, the bracket 81, and the toggle connecting one arm of said lever 88 with the bracket, and means for operating said delivery-gripper, substantially as 50 set forth.

9. In a printing machine, the combination with the type-bed, the rack thereon, the tracks on which the impression cylinder rolls, the said cylinder, its wheels, the frame which carries the cylinder, and means for moving the cylinder to and fro over the type-bed, of the double-acting lock which locks the cylinder to its frame when its parts are in one position and to its wheels when its parts are in their
 60 other position, said lock comprising the diametrically arranged bolt 30, on the cylinder, said bolt having a tip 31 at one end to engage a socket 32 in the frame and a stud 33 at the other end to lock the cylinder to its wheels, 65 the toggle for operating the bolt, coupled at one end to the bolt and at the other end to the cylinder, and the spring 34, arranged to shoot the bolt when freed by the breaking of the toggle knuckle, and automatic means for operating said lock, substantially as set forth. 70

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE R. CLARKE.

Witnesses:

HENRY CONNETT,
 JAS. KING DUFFY.