

(Model.)

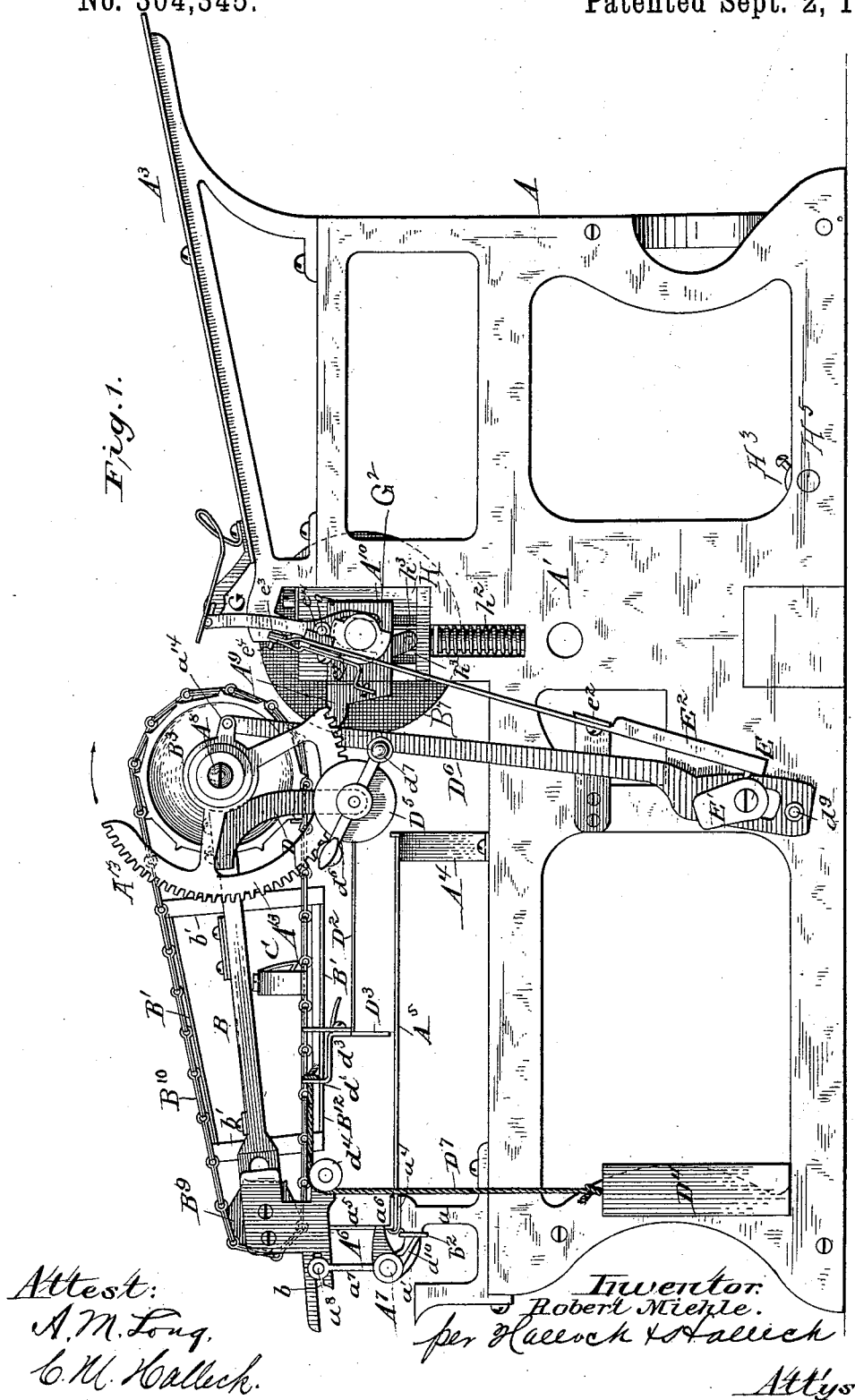
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R. MIEHLE.

PRINTING PRESS.

No. 304,345.

Patented Sept. 2, 1884.



(Model.)

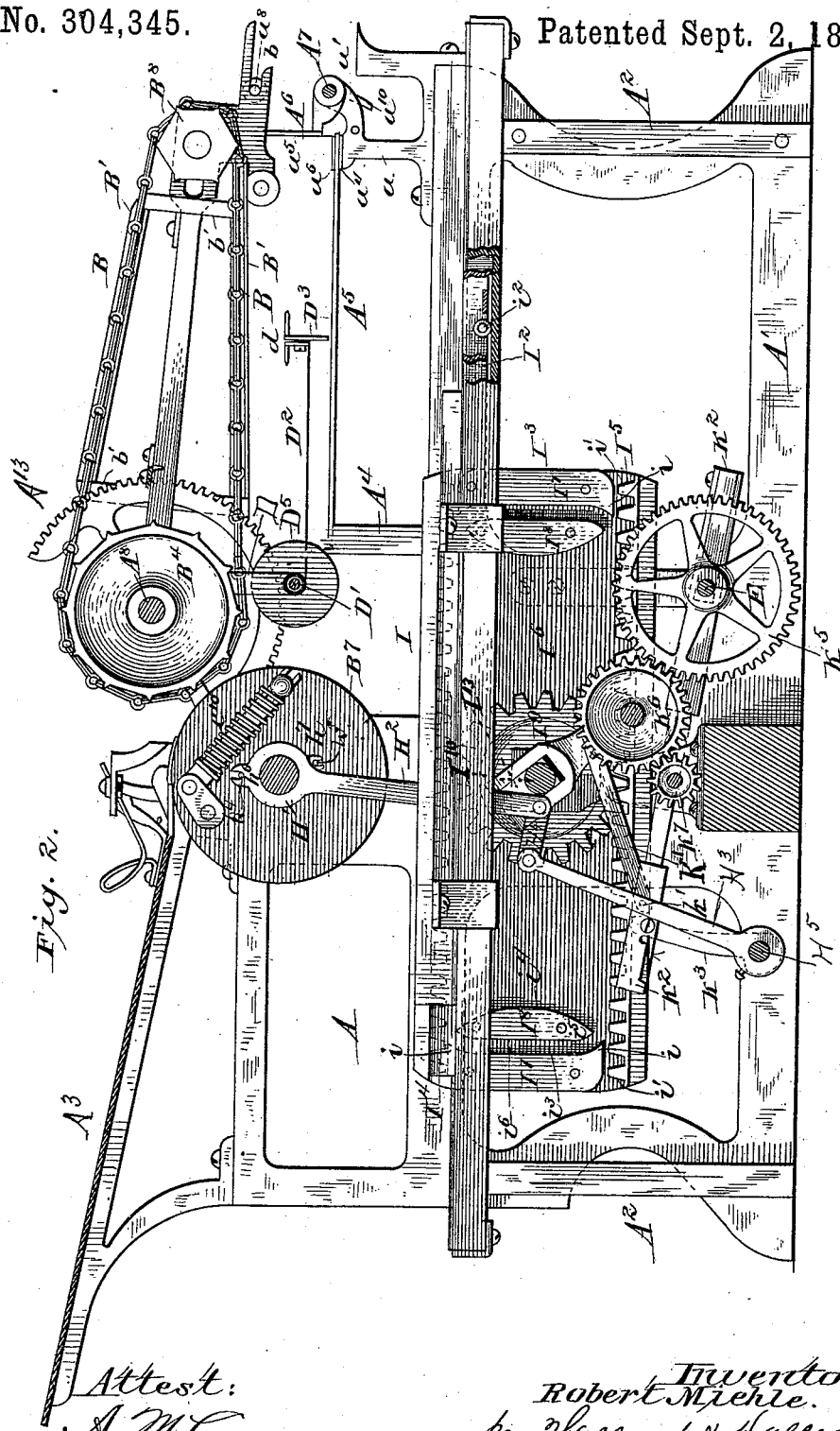
7 Sheets—Sheet 2.

R. MIEHLE.

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No. 304,345.

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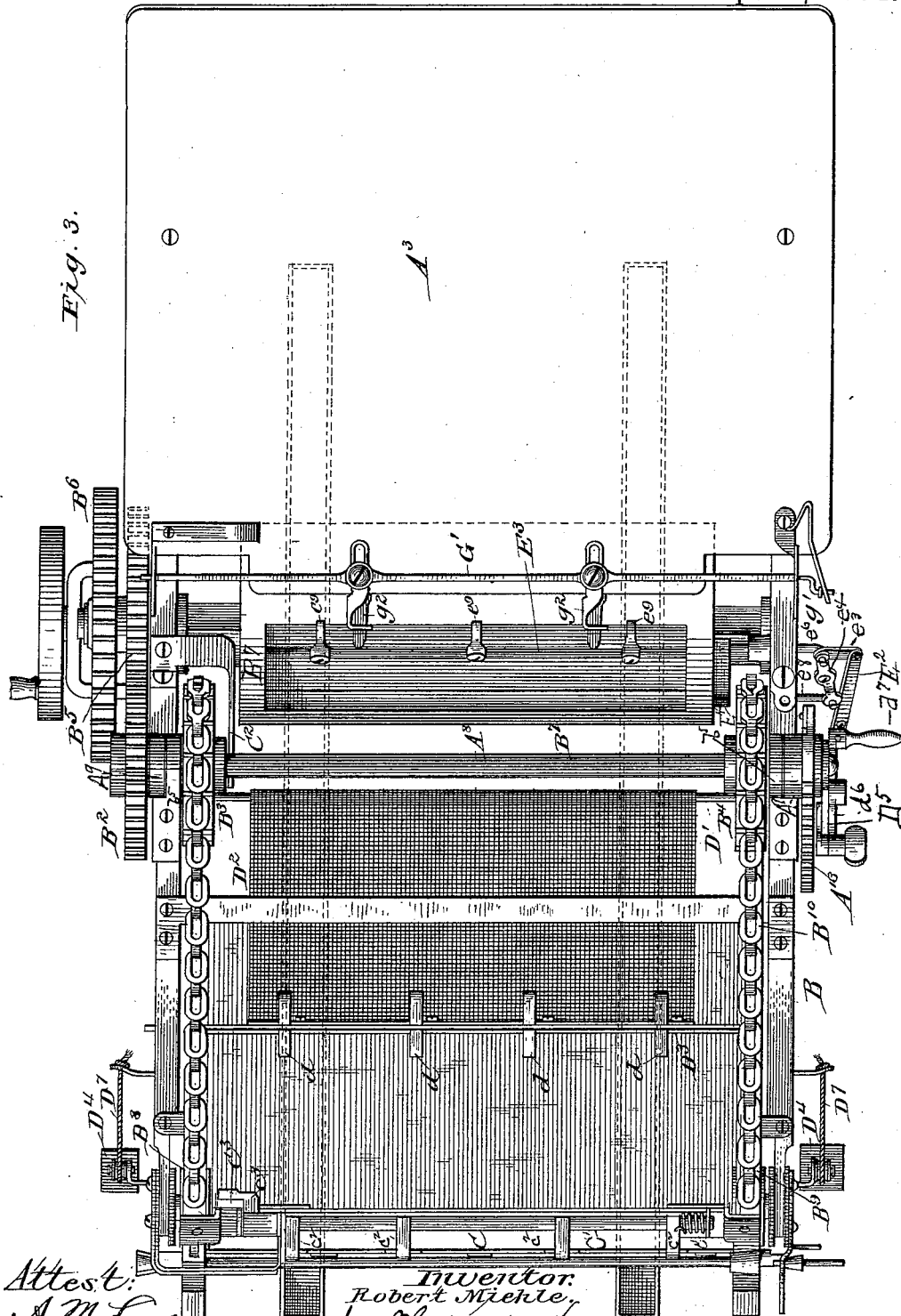
(Model.)

7 Sheets—Sheet 3.

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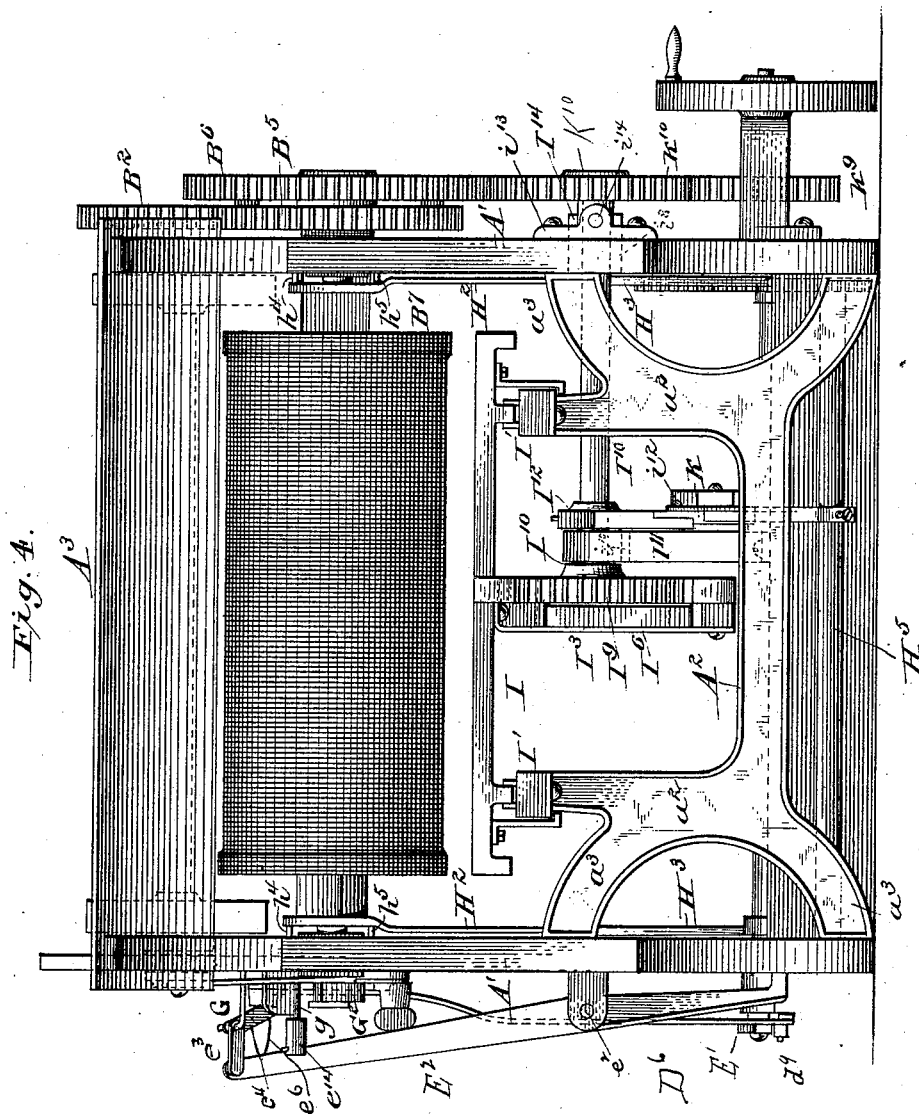
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7 Sheets—Sheet 4.

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7 Sheets—Sheet 5.

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Fig. 5.

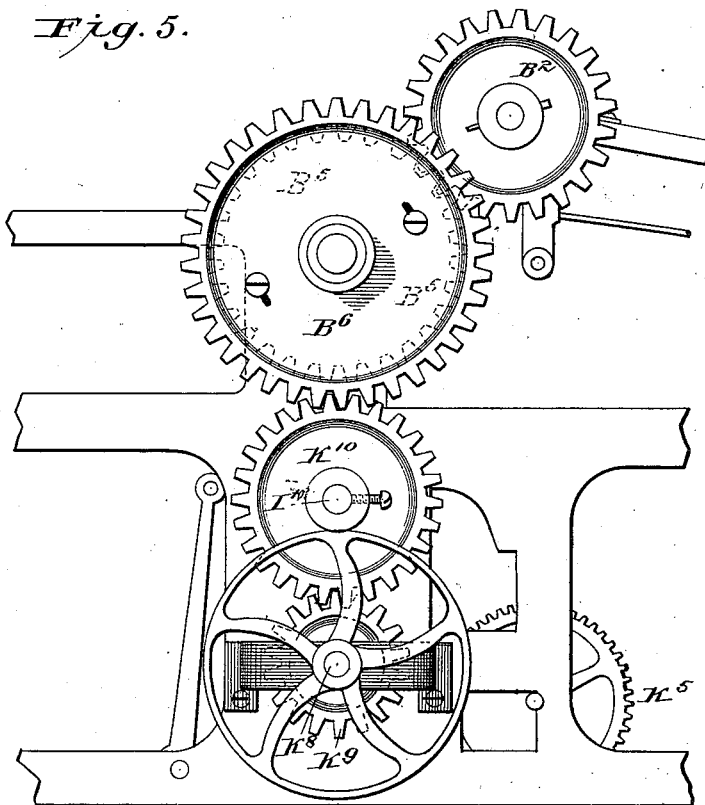
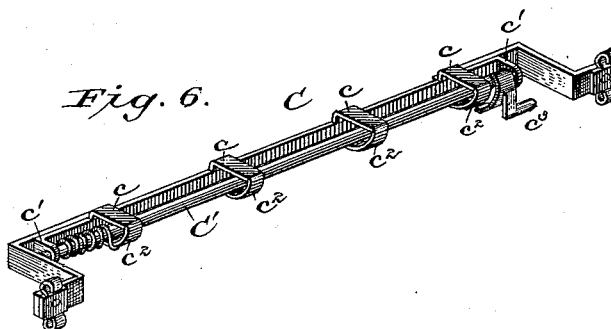


Fig. 6.



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Fig. 10.

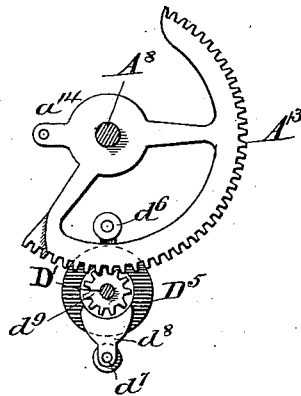


Fig. 11

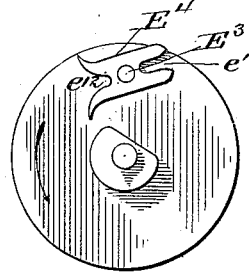


Fig. 7.

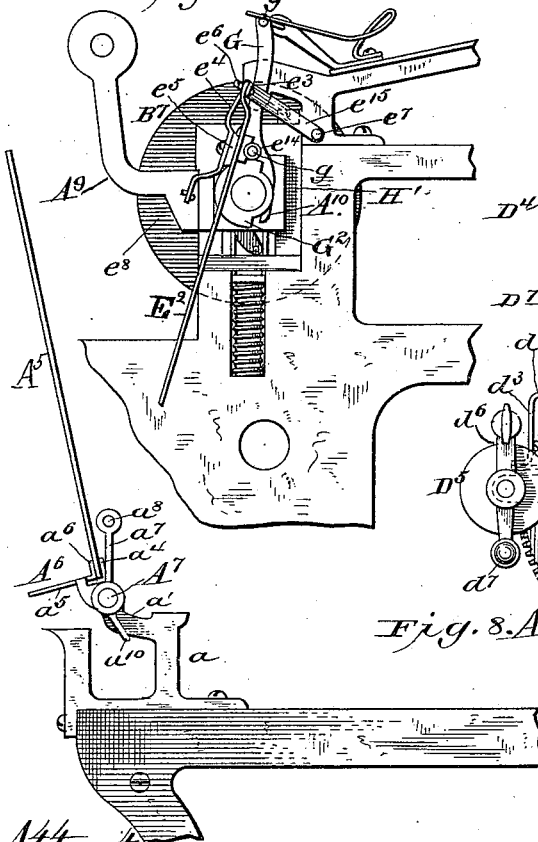
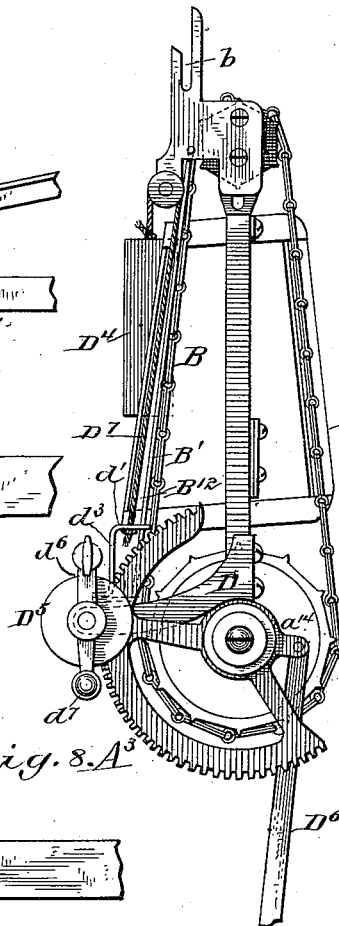


Fig. 9.

Fig. 8.



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7 Sheets—Sheet 7.

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Fig. 12.

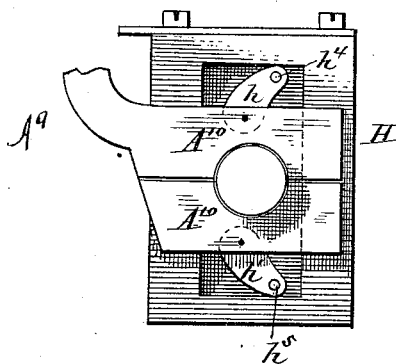


Fig. 13.

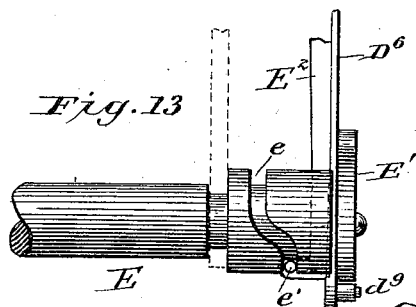


Fig. 14.

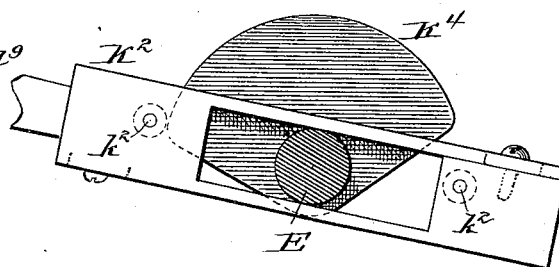


Fig. 15.

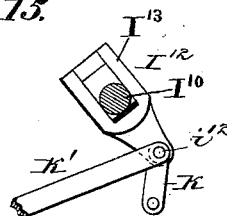
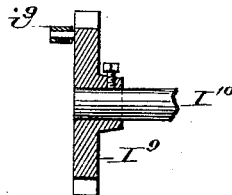


Fig. 16.



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UNITED STATES PATENT OFFICE.

ROBERT MIEHLE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOHN J. MIEHLE, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 304,345, dated September 2, 1884.

Application filed May 4, 1883. (Model.)

To all whom it may concern:

Be it known that I, ROBERT MIEHLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to two-revolution-cylinder or stop-cylinder presses. In this class of presses it has been common to take the printed sheets from the cylinder and deposit them upon the table on the front of the press. The devices heretofore employed for this purpose have been more or less complicated, and in nearly every instance bring the printed side of the sheet in contact with some part of the press. Other devices have been employed which do not bring the printed side in contact with the press, but convey the sheets upon tapes moving upon a jointed frame which lays one end of the sheet upon the front end of the table, and then draws away from the table in such a manner that the sheet will be allowed to fall upon the latter with the printed side uppermost.

The object of my invention is to improve upon this class of devices.

To that end the nature of my invention consists of constructions and combinations of parts, all as will hereinafter be described in the body of the specification and pointed out in the claims.

Referring to the drawings, Figure 1 represents an elevation of one side of the press; Fig. 2, a side view showing the interior of the press, the side frame having been removed and the shafts shown in section; Fig. 3, a top plan view; Fig. 4, a rear elevation; Fig. 5, a side elevation of part of the machine on the side opposite to that shown in Fig. 1; Fig. 6, a perspective of the grippers; Fig. 7, a detail of part of the press, showing one end of the cylinder, its shaft, and the other parts for operating the cam on the end of the cylinder; Fig. 8, an elevation showing the receiving-board elevated; Fig. 9, an elevation showing the delivery-frame and its appendages turned up, so that the interior of the press can be in-

spected; Fig. 10, an elevation of the segmental wheel on the side opposite to that shown in Fig. 1; Fig. 11, an end view of the cylinder and cam; Fig. 12, a side elevation of the journal-box on an enlarged scale; Fig. 13, a detail of shaft E; Fig. 14, a detail of rod K²; Fig. 15, a detail of the toggle-joint and appendages; Fig. 16, a vertical section of wheel I⁹.

A represents the frame of the press, consisting of sides A' A', connected at their ends by cross-pieces A², having standards a², connected by short arms a³ to the inner side of the sides A' A'. The object of this construction is to leave a sufficient space between the standards a² for the passage of the bed, and thus increase its working-space, so that the latter may be formed in a manner and for a purpose that will hereinafter be described.

The upper part of the frame at the rear end is connected together by the feed-board A³ and an arch, A⁴, which forms the rear support for the delivery-table A⁵. The front end of said table rests upon the horizontal part a⁴ of an angle-plate, A⁶, and is held thereon by lugs a⁶, attached to the vertical part a⁵ of plate A⁶. The under side of part a⁴ rests upon brackets a, having forwardly-projecting arms a', in which is journaled a shaft, A⁷, having arms attached to the angle-plate A⁶. At each end of this shaft are upwardly-projecting arms a⁷, provided with pins a⁸ and downward extensions a¹⁰, which, when the pin b² is inserted in the perforation in the main frame, prevents the shaft A⁷ from revolving. The pins a⁸ pass into slots b in the end of the delivery-frame B, and serve to hold the latter in place, and when withdrawn permit of its being swung or moved to the position shown in Fig. 9. The rear end of the delivery-frame B is journaled at b⁵ to a shaft, A⁸, which in turn is journaled in upwardly-projecting arms A⁹ upon the journal-box A¹⁰. (See Figs. 1, 3, and 7.) Upon this shaft are keyed wheels B², B³, and B⁴, placed, respectively, as shown in the top plan view, Fig. 3. Wheel B² meshes with a pinion, B⁵, on the wheel B³, which is attached to the shaft of the cylinder B⁷. The wheels B³ and B⁴ are sprocket-wheels with raised teeth for the chains B¹⁰, which connect said wheels B² and B³ with similar wheels, B⁸, B⁹, journaled to the front end of the delivery-

frame. If desired, wheels having depressions and belts having ribs may be substituted for the sprocket wheels and chains. Attached to each chain and at opposite points is a gripper-frame, C', having stationary jaws c and arms c' , in which is journaled a shaft, C', having the movable jaws c^2 and the usual closing-spring.

Upon one end of shaft C' is a wiper, c^3 , which, when it slides down the cam C², causes the shaft C' to partly revolve and separate the nipping-jaws c and c^2 , which grasp the sheet at the same time that the cylinder-nippers release their hold upon the printed sheet. The gripper-frame, while carrying the sheet, is drawn across the space between the front of the cylinder until the wiper comes in contact with cam C², which forces the nipping-jaws apart and causes them to deposit the sheet upon the delivery-table. The gripper-frame then passes over wheels B⁸ and B⁹ and toward the cylinder.

To prevent the chain or belt from sagging, I provide grooved supports or bearings B', which are attached by arms b' to the frame B. If desired, the center bar of the frame may be dispensed with and a frame having grooves in its upper and lower sides for the chain or belt used instead.

Projecting downwardly from the frame B are arms D, having journaled therein a shaft or reel, D', upon which is wound a cloth, D². If desired, tapes may be substituted for the cloth. This cloth is attached by its loose end to the support and packer D³, having upwardly-projecting arms d^3 , which move upon ways or rods B¹² on the delivery-frame.

Upon the rear end of arms d^3 is an upwardly-projecting arm, d' , to which is attached a cord, D', extending forwardly and downwardly over a pulley, d^4 , and having a counter-weight, D⁴, attached to its lower end.

Attached to the upper side of the packer D³ are projecting lips d , which support the sheet carried by the deliverer until the gripper C is about to release its hold, when the packer draws back, so that the sheet will fall upon the delivery-table. After the sheet has fallen the packer moves forward and pushes the sheet against the vertical part a^5 of the angle-iron A⁶. This movement is accomplished by the following means:

At the outer end of reel D' is a loose thimble, D⁵, held in place on the inner side by the pendent arm D, and on the outer side by a bar, d^6 , fixed to the shaft, and having a screw-pin, d^7 , on one end, and a handle for revolving the device upon the other. The screw-pin d^7 is screwed in the eye of a forked clutch, d^8 , which embraces the shaft of the thimble, and may be drawn tightly against the inner face of the base of the thimble by turning the screw, and thus form a clutching device. The fork of the clutch prevents the latter from slipping or falling away from the thimble. When the clutch is loose, the cloth may be wound upon the reel by moving the bar d^6 ; or the cloth may be unwound by allowing the

counter-weight D⁴ to draw the support and packer toward the front of the machine. The object of this is to regulate the distance between the front wall of the packing-chamber and the packer, so that sheets of different sizes used at different times will be accurately packed.

Upon the shaft of thimble D⁵ is a pinion, d^9 , which gears with a segmental gear-wheel, A¹³, loose upon shaft A⁸. When the thimble is clutched, the deliverer may be moved to the position shown in Fig. 9 by unloosening pin b^3 , (which is inserted in the side frame, and against which the downwardly-projecting extension a^{10} of arms a^7 rest,) to allow the pins a^8 to be disengaged from the slots b , and revolving the thimble D⁵ on segmental wheel A¹³ by means of bar d^6 until it has reached any desired position. The deliverer can be returned to its position by revolving bar d^6 in the opposite direction, and be fixed in place by inserting pin a^8 in the slot b in the delivery-frame, and the pin b^2 in the frame and against extension a^{10} .

Projecting rearwardly from and forming part of the segmental wheel A¹³ is an arm, a^4 , to which is attached a rod, D⁶, extending to a cam, E', on shaft E. The lower end of the rod is slotted to have a vertical movement, and is provided with a projection, d^9 , which is forced downwardly by the cam E', and draws the rod with it. In moving downwardly the rod draws the segmental gear in the direction of the arrow and revolves reel D' by means of thimble D⁵. The reel winds part of the cloth upon itself, and leaves space for the sheet to fall. This movement is accomplished at the moment the nippers let the sheet fall. When the lesser diameter of the cam E' is against the projection d^9 , the winding force of the reel D' is released, and the counter-weight draws the support and packer against the end of the paper, which is forced against the front board of the packing-chamber. This movement is accomplished at every second revolution of the cylinder, so as to give each sheet full chance to be packed in place by the time the next sheet is deposited in the chamber.

On the shaft E, at the same end as cam E', is groove e , in which a pin, e' , on a connecting-rod, E², rests. This rod is fulcrumed at e^2 , and pivoted to a link, e^3 , which is supported by a lever, e^4 , fulcrumed on a lug, e^5 , on the frame.

Upon the end of the link e^3 is fixed a pin, e^6 , which passes through the frame toward the end of the cylinder, and on the lower end of lever e^4 is a similar pin, e^8 . The pin e^6 is forced toward the cylinder, when the lower end of rod E² is forced outwardly by the groove e , and the pin e^8 is drawn away from the cylinder at the same time by lever e^4 , which is connected to the link e^3 , as shown. The position of the pins is reversed when the lower end of the rod E² is drawn toward the frame. This construction is common in two-revolution presses.

In cylinder B' is the usual longitudinal depression, having a shaft, E³, journaled therein, and provided with nippers e⁹, which catch the end of the sheet passing from the feed-board and holds it against the cylinder while the latter is being revolved.

To insure the nippers holding the sheet thereon, a spiral spring, e¹⁰, attached by one end to the cylinder and by the other to a crank-arm on the end of shaft E³, is provided. The nippers are lifted from the cylinder by a cam, E⁴, having slots e¹¹ and e¹². The slot e¹² embraces pin e⁸, which turns the cam E⁴ and rocks the shaft in such manner as to point the nippers to the opposite side of the longitudinal depression to that at which they nip the sheet, and they are held there by the action of spring e¹⁰, which changes its position with each rocking of the shaft E³. The position of the nippers is changed by the slot e¹¹ of cam E⁴ being brought in contact with the pin e⁶, which turns the cam E⁴ and brings the point of the nippers against the cylinder in the immediate vicinity of the longitudinal slot, as shown. When the nippers are in the position and are holding a sheet, the pin e⁸ does not act upon the cam, but is withdrawn by the lever e⁴, which also withdraws the pin e⁶ when the cam has reached a point nearly opposite it, and forces pin e⁸ toward the cylinder, so that the cam E⁴, and consequently the nippers, will be turned to release the sheet at the time the nippers on the deliverer draw said sheet from the cylinder.

In practice it has been found that by carelessness, or by the rod E² becoming incapable of operating the parts, the cam E⁴ becomes turned, and, striking in that position against pin e⁶, causes some part of the mechanism to break.

Projecting rearwardly from and attached to the rod E² is a sleeve, e¹⁴, which moves to and from the frame with the rod. Passing through this sleeve is a pin, g, attached to an arm, G, having a forked end, which embraces the cylinder-shaft, or it may be slotted and attached to a pin on the frame. The upper end of arm G is attached to a crank-arm, g', on the bar G' of the feed-guides g². These guides are operated by a cam, G², on the end of the cylinder-shaft and under the pin g in the following manner: When the nippers are about to take the sheet from the feeding device and hold it against the cylinder, the greater radius of the cam is just entering in contact with the sleeve e¹⁴, and revolves in that position until the sheet leaves the feed-board, when the lesser radius presents itself and the feed-guides fall and prevent the second sheet from passing from the table. At the same time that the feed-guides fall the sleeve e¹⁴ is drawn outwardly by the rod E², and the cam is free to revolve without contact, the object being to prevent the cam from lifting the feed-guides when the cylinder is making its second revolution. When the second revolution has

been completed, the sleeve e¹⁴ is brought in contact with the cam, for the purpose of lifting the feed-guides.

It may be noted here that the movement of the sleeve e¹⁴ is the same as pin e⁶, which closes the nippers, so that the latter's movement and the lifting of the feed-guides are coincident.

The cylinder-shaft is journaled in boxes A¹⁰, formed in two sections attached together, and which move in guides in the box-frame H, attached to the side frames of the press, and are supported by a spring, h², having a ring attached to its top and provided with vertical projections h³, which rest against the under side of the box. The upper and lower sides of the box are recessed for the ends of cams h and h', which are pivoted to the walls of the recesses and operate against the top and bottom of the box-frame. The relative position of the cams is shown in Fig. 18. Upon each cam is an inwardly-projecting pin, h⁴ h⁵, which rest in forked projections h⁶ and h' on ring H', having a downwardly-extending rod, H², which is connected to a rod, H³, by a link, H⁴. The rod H³ is fixed to a rock-shaft, H⁵, which, when rocked, rocks the ring H' in such a manner as to alternately force the free end of cams h and h', respectively, against the top and bottom of the box-frame, and thus depress or elevate the cylinder.

To each of the boxes A¹⁰ is attached a bracket, A⁹, which supports the shaft A⁸, that carries the delivery-frame. When the cylinder is lifted, the same motion elevates the rear end of the delivery-frame. The forward end of the latter slides on the pins a⁸, and thus compensates for the lifting movement of the frame. Beneath the cylinder is the bed I, supported by the ways I', having frames I², provided with rollers i² for the flanges of the bed to move upon. Attached to the middle of the frame is the bed-rack I³, consisting of two racks, I⁴ and I⁵, joined by a plate, I⁶, having at each end shoes I' and I⁸. The racks I⁴ and I⁵ terminate a little beyond the curved end i of shoes I', (see i'.) The shoes I' are attached to the extreme end of plate I⁶, and curved at their upper and lower inner ends, i, and vertical (i³) between these points. The inner sides, i⁴, of shoes I⁸ are rounded, and their outer ends, i⁵, are inclined, so as to be parallel with ends i, and their middle part, i⁶, is parallel with part i³ on shoe I'. The object of these curves is to permit the pinion to pass out of contact with either the upper or lower rack, and pass to either the lower or upper rack, where it will strike or bear against the end i' and be drawn in between the racks, but only in contact with one. To accomplish this I provide a roller, i⁹, which is journaled to a pin on the pinion I'. When the pinion I' revolves, say, upon the lower rack and reaches the point i', it leaves the rack, but the roller catches upon the lower curved end i of shoe I' and passes up into the space between the shoes. When it reaches the upper curved part i, it draws the pinion toward the

rack. The teeth of the pinion strike against the rack at i , and mesh with the upper rack and draw the bed toward the rear of the machine. The same operation is performed when
 5 the pinion reaches the opposite end of the rack, except that the pinion descends to the lower rack. By this means the bed is kept in motion with the pinion, which revolves once from one end of the rack to the other, and the roller
 10 i^9 is so placed that it will enter one end of the space between the shoes and continue its motion to the other end, the same as if the space were cogged, but without the jar that would occur if such space were cogged. The pinion
 15 I^9 is fixed to a shaft, I^{10} , which passes through slot i^{10} in standard I^{11} , through part I^{13} of toggle-joint I^{12} , and through a bearing, I^{14} , having trunnions i^{14} , which are held against the frame by straps i^{13} .

20 Attached to the toggle-joint I^{12} at joint i^{12} is a link, K , pivoted to the standard I^{11} . On the joint i^{12} is a rod, K' , having its rear end pivoted at k' to a connecting-rod, K^2 . The rear end of this rod is pivoted to an arm, K^3 , on rock-shaft H^5 . The forward end of connecting-rod K^2 is slotted and provided with rollers k^2 at each end of the slots, for the cam K^4 to move upon. These rollers may be so arranged
 25 that they can be moved forward to take up the wear of the cam K^4 by removing the top and bottom plates and resetting them by means of the slots and screws. (See Fig. 14.) The cam K^4 is keyed to shaft E , which is revolved by a gear, K^5 , which meshes with an idle-wheel, K^6 , that receives its motion through cog-wheel K^7
 30 on the drive-wheel shaft K^8 .

Extending from the frame is a loop for supporting the shaft K^8 , which carries a gear-wheel, K^9 , meshing with a gear-wheel, K^{10} , on
 40 the end of the shaft I^{10} .

Gearing with wheel K^{10} is the drive-wheel B^6 for the cylinder, and having a pinion, B^3 , which in turn gears with wheel B^2 , for a purpose heretofore explained.

45 In practice it is often necessary to remove the damp sheets from the receiving-table, but, owing to their dampness, they are liable to be damaged. To prevent this I place the receiving-table upon the standard and hold them in place by lugs, from under which they can be
 50 withdrawn by simply sliding the table out at either side.

It can readily be seen that a table loaded with damp sheets may be removed and a second table inserted without difficulty by hinging the delivery-frame at one end, so that it can be drawn up, as before described, and, hinging the angle-iron upon which the table rests, the whole interior of the press can be exposed to view.
 60

I do not claim in this application a pendent plate provided with two racks—one above the other and facing each other—and double shoes at each end, and a gear-wheel which makes
 65 exactly one revolution in moving the bed in one direction and passes between the shoes to

the other rack, as that will form the subject-matter of a separate application.

Having thus described my invention, I claim as new—

1. In a printing-press, the combination of a cylinder, a sheet-deliverer carrying the sheet by one end, a table below said deliverer, and an adjustable support interposed between the table and deliverer, substantially as described. 70

2. In a printing-press, the combination of a frame having cams C^2 and C^3 , a cylinder, a sheet-deliverer having sheet-nippers operated by said cams and carrying the sheet by one end, a table below said deliverer, and an adjustable support interposed between the table and deliverer, substantially as described. 75

3. In a printing-press, the combination of a cylinder, a receiving-table having a stop at its front end, an automatic sheet-deliverer above the table and carrying the sheet by its front end, and a support between the deliverer and table for the free end of the sheet, and having means, substantially as described, for automatically drawing said support back as the sheet is about to be released, and moving it forward when the next sheet has been received, as set forth. 80

4. In a printing-press, the combination of a delivery-frame hinged to a shaft, said shaft having a segmental gear at one end, and a secondary shaft journaled in the frame, and having a gear-wheel which meshes with the segmental gear, and a crank for turning the supplemental shaft, substantially as described. 85

5. In a printing-press, the combination of a shaft provided with a segmental gear having a rod operated by a cam, and a supporter and packer connected to a reel by a cloth, and having a counter-balance, and said reel having a gear-wheel meshing with the segmental gear, substantially as described. 90

6. In a printing-press, the combination of a delivery-frame having rods, a supporter and packer having arms sliding on said rods and connected to a reel by a cloth, counter-weights for drawing the supporter and packer forward, said reel having a gear-wheel, and a shaft having a segmental gear, operated substantially as described. 95

7. In a printing-press, the combination of a deliverer, a segmental wheel loose upon one end of a shaft, and having a connecting-rod operated by a cam, a table beneath the delivery-frame, a supporter and packer between the table and deliverer, and connected to a shaft or reel by cloth, said shaft or reel having a gear-wheel meshing with the segmental gear, and counter-weights attached to the deliverer and packer by cords passing over rollers at the front of the frame, substantially as described. 100

8. In a printing-press, the combination of a shaft having a bar fixed at one end and provided with a set-screw and a clutch, and a thimble on said shaft, having a flange adapted to be fixed in place by clamping it between the bar and clutch, substantially as described. 130

9. In a printing-press, the combination of a deliverer hinged at one end and a receiving-board hinged at the end opposite to the hinged end of the deliverer, substantially as described, so that both may be elevated, and thus expose the interior of the press.

10. In a printing-press, the combination of a frame having an arch for supporting one end of a receiving-table, and brackets at the other end, a pivoted angle-plate attached to the bracket, and having means, substantially as described, for holding the table.

11. In a printing-press, the combination of the cylinder-shaft journal-boxes having cams pivoted at top and bottom, a frame surrounding said box, and a connecting-rod pivoted on the cylinder's shaft, and having pins attached to the cams on the journal-boxes, substantially as described.

12. In a printing-press, the combination of the rod E^2 , having a sleeve, e^{14} , connected

therewith, a frame having pin g for sleeve e^{14} , and a shaft having a cam which revolves beneath the pin g , substantially as described.

13. In a printing-press, the combination, with the bed carrying a pendent rack, I^3 , of a gear-wheel, I^9 , standard I^{11} , a toggle-joint, I^{12} , a shaft, I^{10} , carrying wheel I^9 , and journaled at its outer end in a trunnioned bearing attached to the frame, a link pivoted to standard I^{11} and toggle-joint I^{12} , a rod, K^1 , attached to the link by one end and to a rod, K^2 , by the other, and said rod K^2 attached to a crank, K^3 , on shaft H^5 , and supported on shaft E , having a cam for oscillating the rod, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT MIEHLE.

Witnesses:

C. A. NEALE,

M. F. HALLECK.