(No Model.) 5 Sheets—Sheet 1.

M. VIERENGEL.

CYLINDER PRINTING MACHINE.

No. 379,188. Patented Mar. 6, 1888.

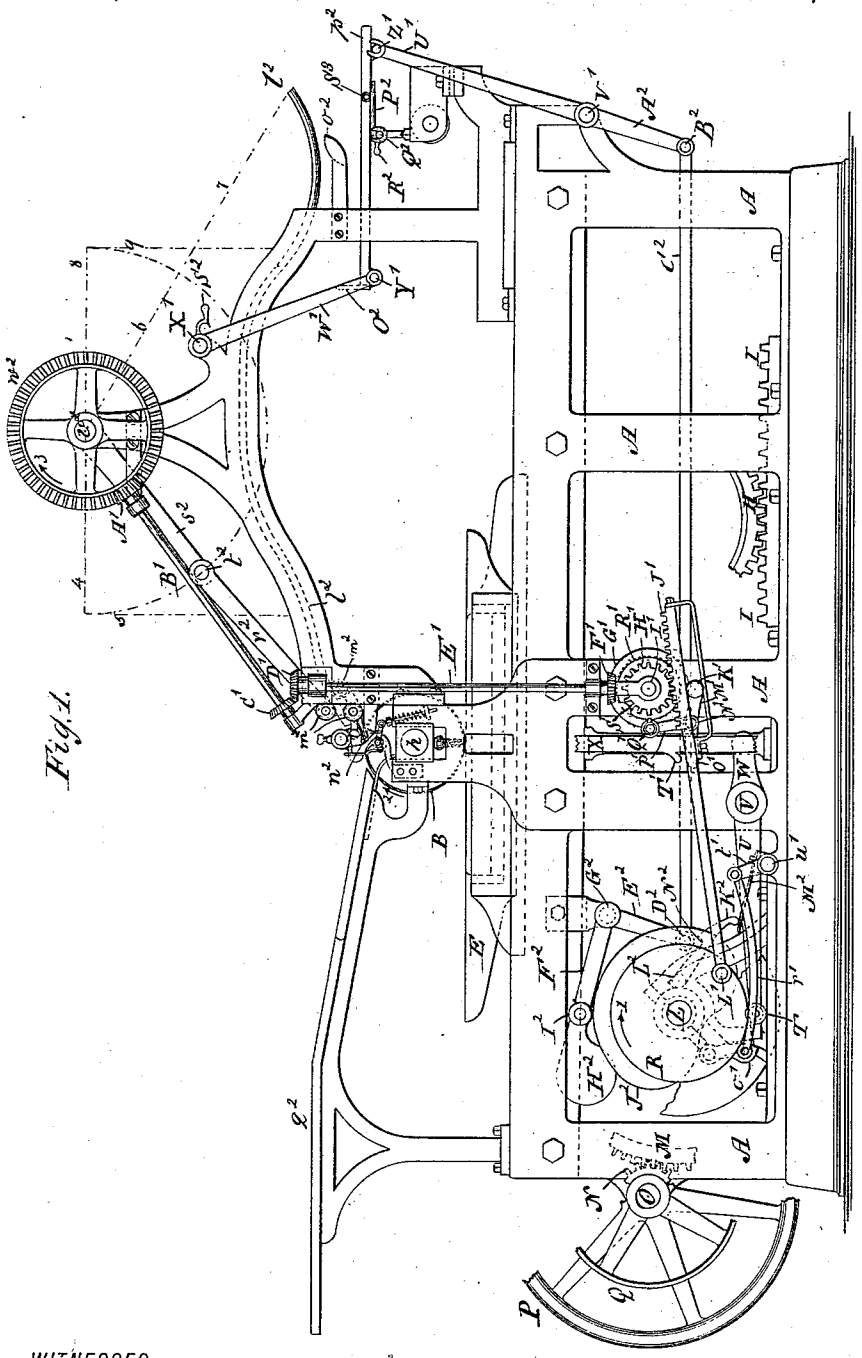


Fig. 1.

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(No Model.) 5 Sheets—Sheet 2.

M. VIERENGEL.

CYLINDER PRINTING MACHINE.

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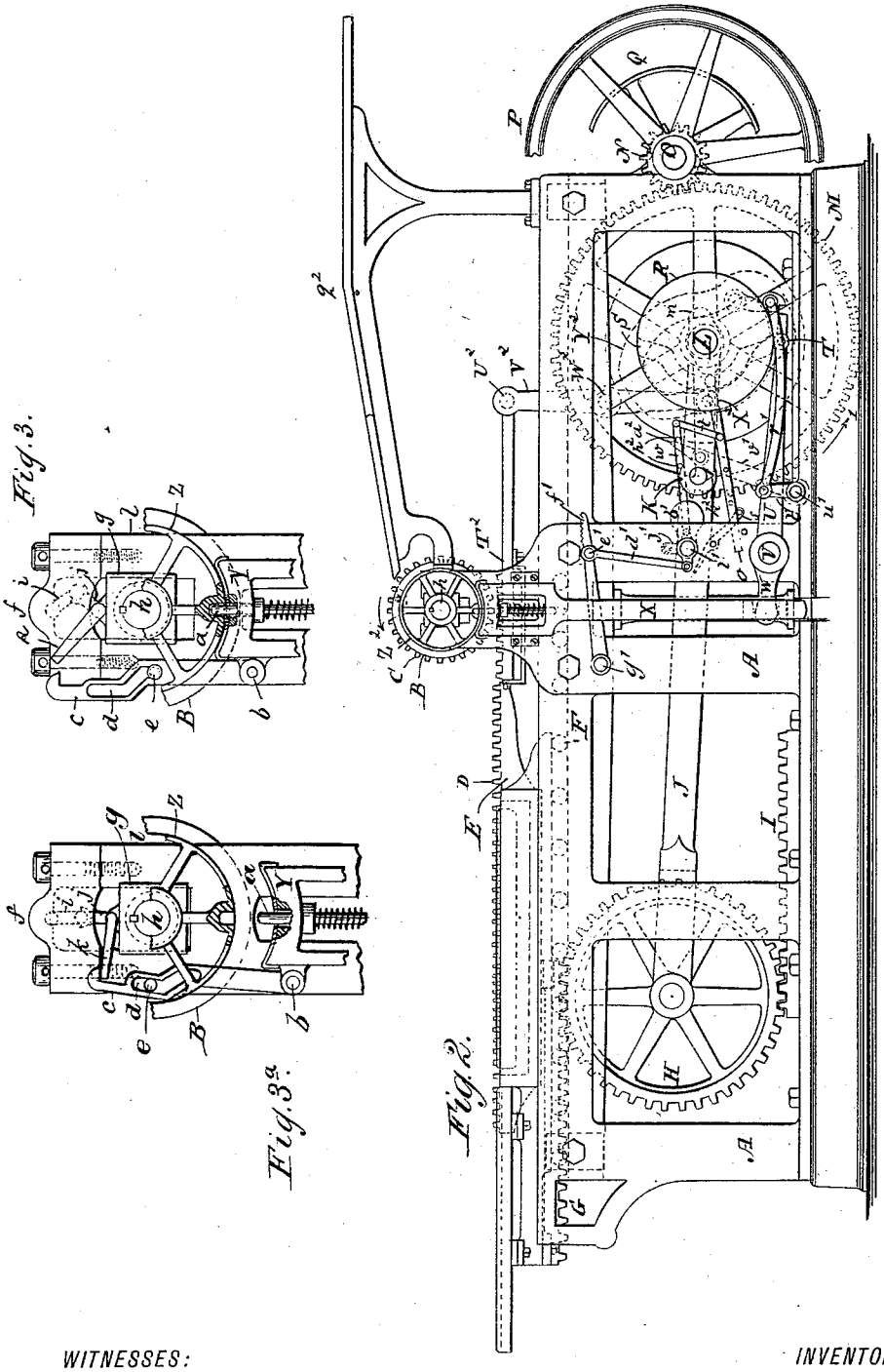


Fig. 2.

Fig. 3.

Fig. 3a.

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(No Model.) 5 Sheets—Sheet 3.

M. VIERENGEL.

CYLINDER PRINTING MACHINE.

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Fig. 5.

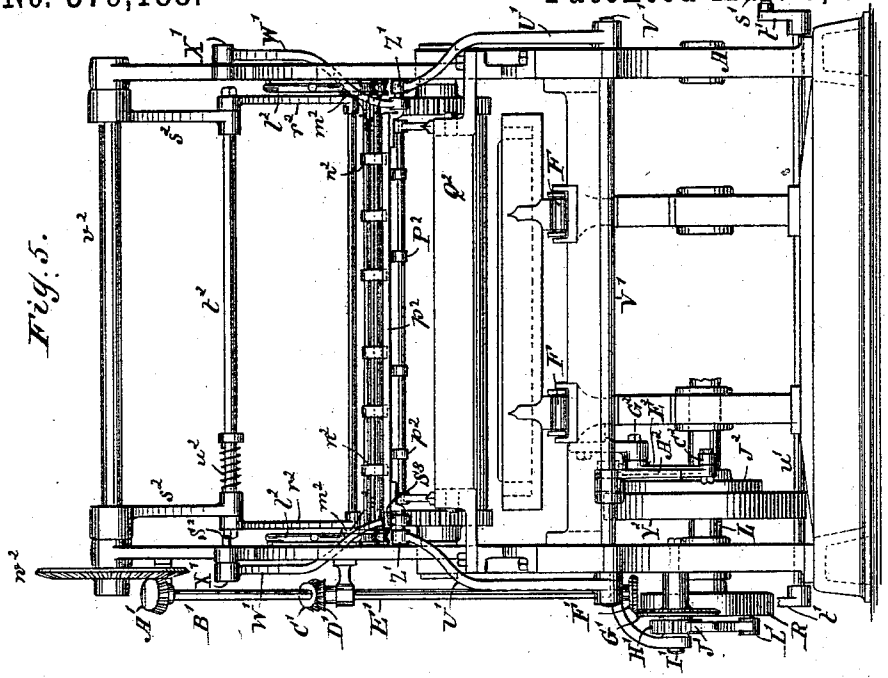
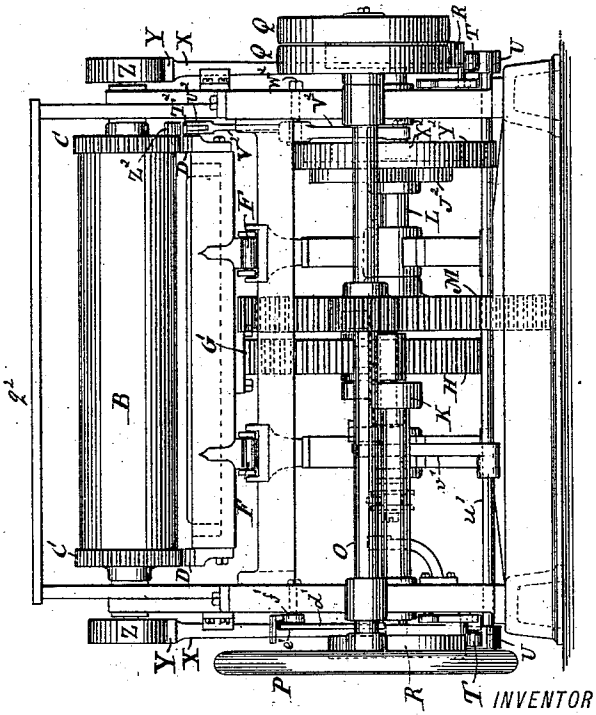


Fig. 4.



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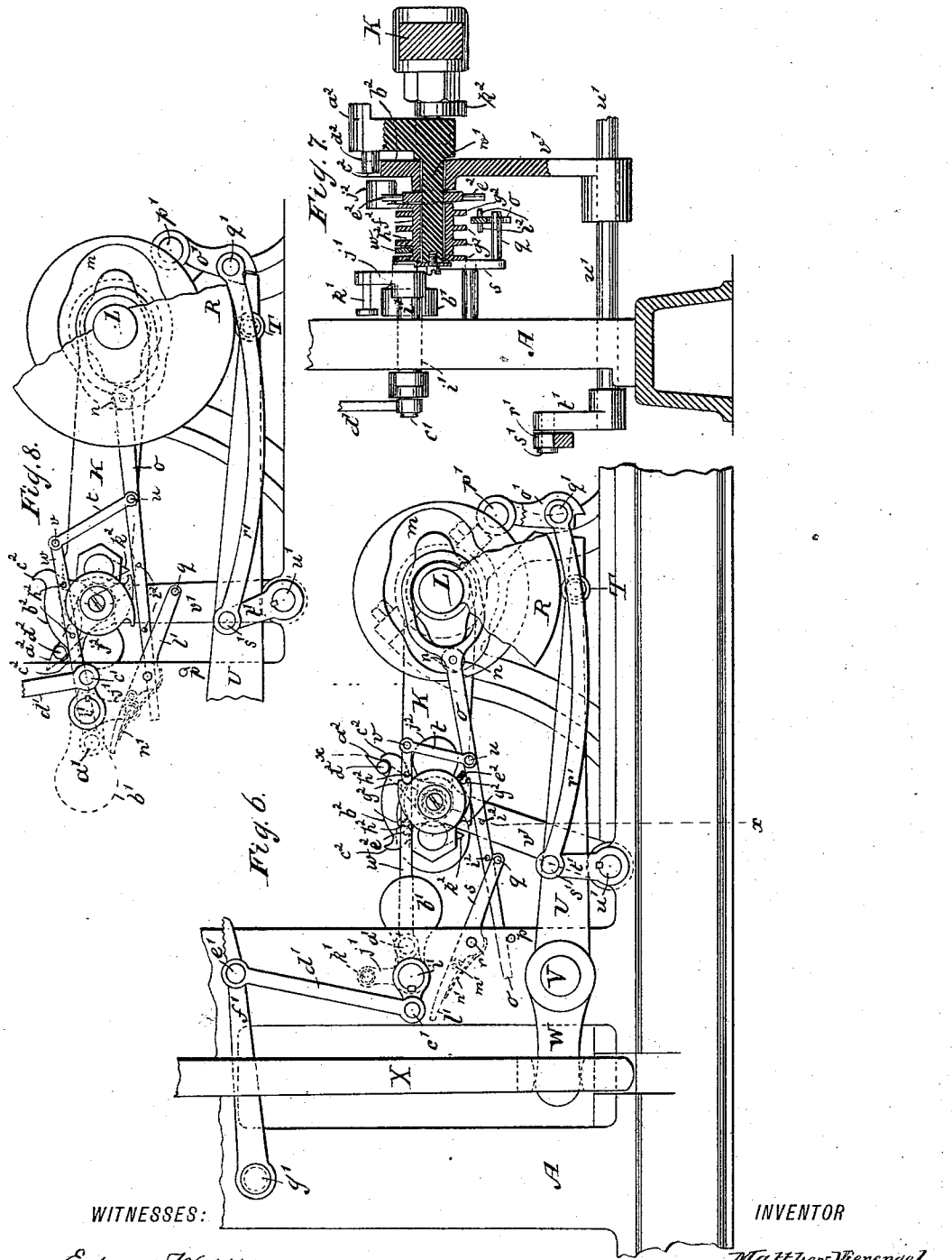
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(No Model.) 5 Sheets—Sheet 4.

M. VIERENGEL.

CYLINDER PRINTING MACHINE.

No. 379,188. Patented Mar. 6, 1888.



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(No Model.) 5 Sheets—Sheet 5.

M. VIERENGEL.

CYLINDER PRINTING MACHINE.

No. 379,188. Patented Mar. 6, 1888.

Fig. 9.

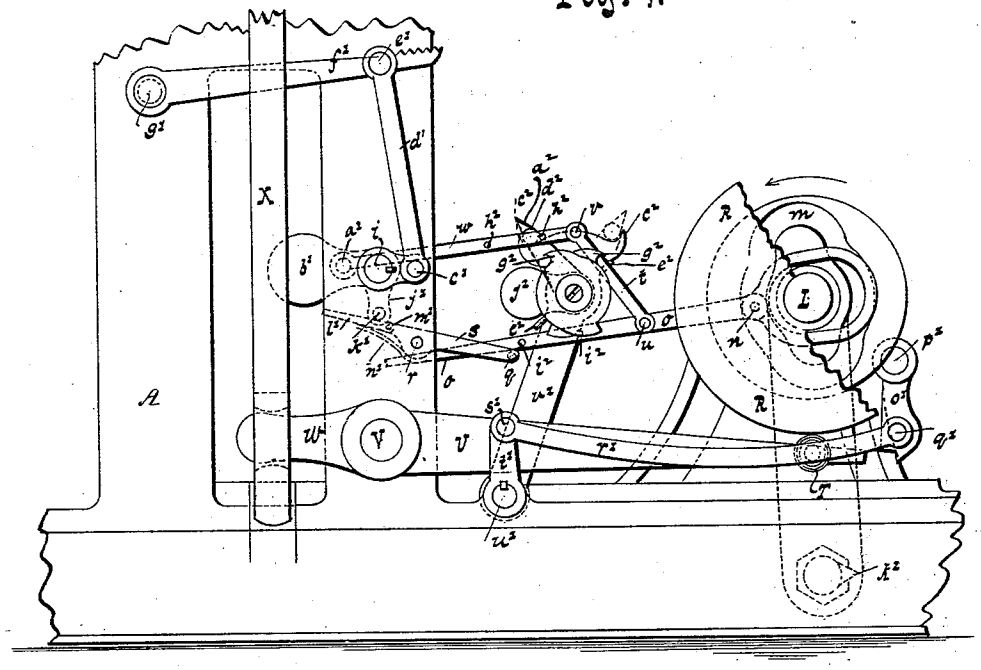
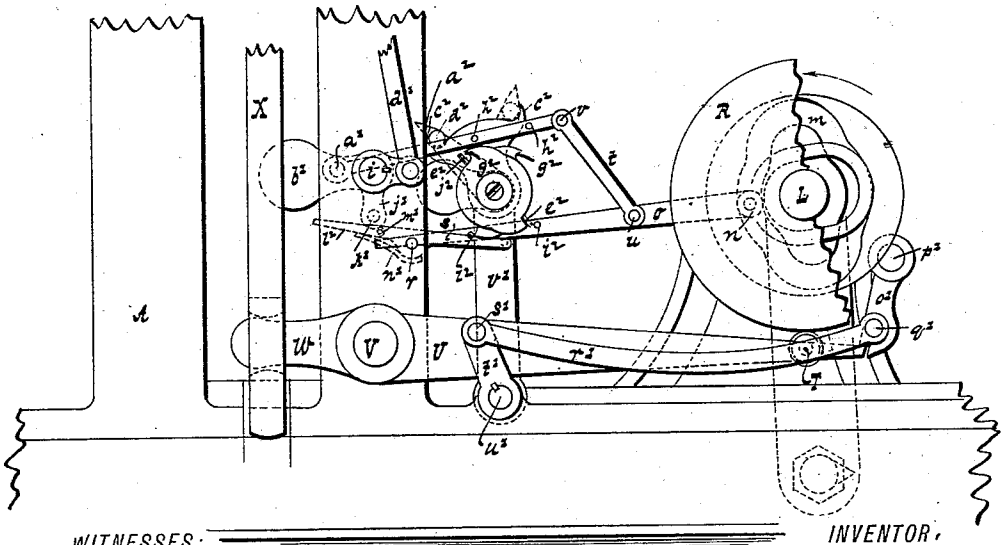


Fig. 10.



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UNITED STATES PATENT OFFICE.

MATTHEW VIERENGEL, OF BROOKLYN, NEW YORK.

CYLINDER PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 379,188, dated March 6, 1888.

Application filed Ju'y 2, 1887. Serial No. 243,239. (No model.)

To all whom it may concern:

Be it known that I, MATTHEW VIERENGEL, a subject of the Emperor of Germany, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Cylinder Printing-Machines, of which the following is a specification.

This invention relates to improvements in printing-presses, as set forth in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a printing-press. Fig. 2 is a side elevation seen from the opposite side from that shown in Fig. 1, and the sheet-delivery apparatus being removed. Fig. 3 is a detail view of an impression-cylinder and adjacent parts, partly in section and parts being broken away. Fig. 3ª is a detail view of the parts shown in Fig. 3 with the detent withdrawn from the impression-cylinder. Fig. 4 is a rear elevation of a printing-press. Fig. 5 is a front elevation thereof. Fig. 6 is a detail side elevation of mechanism for raising the cylinder. Fig. 7 is a section in the plane *x x*, Fig. 6. Fig. 8 is a view similar to Fig. 6, showing the parts in somewhat different relative position. Figs. 9 and 10 are views similar to Fig. 6, showing the parts in different relative position.

Similar letters indicate corresponding parts.

In the drawings, the letter A indicates a frame.

B is an impression-cylinder, the teeth C of which are adapted to gear into the rack D of the type-bed E. The type-bed E is adapted to travel back and forth, being supported on rollers F, suitably applied for that purpose.

The rack G of the type-bed is engaged by the teeth of the wheel H. The teeth of the wheel H engage a fixed rack, I. A connecting-rod, J, extends from the wheel H to the crank K on the shaft L. To the shaft L is secured a toothed wheel, M, which gears into a toothed wheel, N, on the shaft O. Said shaft O is provided with a fly-wheel, P, and with pulleys Q, one of which is fast on the shaft O and the other of which is loose thereon. By applying a belt or other suitable means to the fast pulley Q the shaft O can be rotated.

On the shaft L are cams R, having cam-grooves S extending across them, Fig. 2. The cams R actuate rollers T on the levers or arms U W, oscillating on the pivots or fulcrums V. The portions W of the levers or arms U W rest in holes or recesses in the supporting-arms X. Said arms X are adapted to move back and forth vertically, and said arms have seats Y, Fig. 3, adapted to engage supporting rims or wheels Z, Figs. 3 and 4, on the shaft *h* of the impression-cylinder B. One or more spring-actuated detents, *a*, Fig. 3, are secured to the supporting-arms X, and said detents are adapted to engage recesses in the supporting-rims Z, and thereby prevent the cylinder B from turning.

The boxes *g* of the cylinder-shaft *h* are adapted to slide in ways formed in standards *l* rising from the frame A. Caps *f* are bolted or otherwise secured to the standards *l*, and a toggle-joint, *i j*, is jointed to the caps *f* and to the boxes *g*. Levers or arms *k* are applied to operate the toggle-arms *i j*.

To the supporting-arms X or to the seats Y are secured pivots *b*, supporting hooks *c*. Pins *e*, projecting from the standards *l*, enter guide-slots *d* in the hooks *c*. On the shaft L is a cam, *m*, Fig. 6, which engages a roller, *n*, on the arm *o*. The free portion of the arm *o* can be caused to rest on the pin or rest *p*, fixed to the frame A, or on the pin or rest *q*, projecting from the arm *s* of the lever *l' s*. Said lever *l' s* is adapted to swing about the fulcrum *r* on the frame A, and the arm *l'* is secured to the lever *l' s* by a joint, *m'*. A spring, *n'*, holds the arms *l' s* in the position shown in Figs. 6 and 8.

To the arm *o* is secured a link, *t*, by means of a pivot, *u*. The pivot *v* connects the link *t* to the arm *w*. A pivot, *a'*, connects the arm *w* to the weight *b'* or to a crank-arm connected to said weight *b'*. The weight *b'* is adapted to swing about the shaft *i'*, so as to rest either in the position shown in Fig. 6 or in the position shown in Fig. 8 in dotted lines. The shifting of the weight is accomplished by means of the treadle-arm *f'*, pivoted at *g'* to the frame of the machine. A link, *d'*, is pivoted at *e'* to the treadle-arm *f'*, and at *c'* to a crank-arm of the weight *b'*. By properly actuating the treadle *f'* the weight *b'* can be swung so as to rest either in the position shown in Fig. 6 or in the position shown in Fig. 8. Said arms *w o* are intended to bring the detents *o'*, Figs. 6 and 8, into or out of engagement with the

lever U W, as will be hereinafter set forth. Said detents o' swing on pivots p', suitably secured to a fixed part of the press. Pivots or pins q' connect the detents o' to connecting-arms r'. Pins or pivots s' connect the arms r' to cranks t', keyed to a shaft, u', which receives motion from a lever or detent actuator v', keyed to said shaft u'. To the lever v' is fixed a bracket, b^2, having stops c^2. A shaft, w', Fig. 7, is adapted to oscillate in an eye or seat in the lever v'. A finger, a^2, is fixed to the shaft w', and a lug, d^2, projecting from said finger a^2, is adapted to engage the stops c^2, thus limiting the motion of the finger a^2 in one direction or another, as seen in Figs. 6 and 8.

A collar, f^2, Fig. 7, sits loosely about the shaft w', and to said collar is fixed a weight, j^2. As the collar is turned on the shaft w', the weight j^2 is swung to one side or the other, as seen in Figs. 6 and 8. In swinging to one side or the other, the weight j^2 strikes one or another of the fingers e^2, which are fixed to the shaft w', thus turning said shaft and causing the finger a^2 to rest against one or the other of the stops c^2. To the collar f^2 are fixed four hooks or hooked plates, g^2. Two of said hooks are adapted to be engaged by lugs h^2 on the arm or rod w, and two of said hooks are adapted to be engaged by lugs i^2 on the arm or rod o. To the crank K is secured a lug, k^2, and the relative positions of the fingers a^2 and lug k^2 are such that at certain times the lug k^2 can be brought against the finger a^2 by the revolution of the crank, such contact of the lug k^2 and finger a^2 being made to operate the lever v', as will be hereinafter set forth.

On the frame of the press are secured ways l^2, Figs. 1 and 5, on which the rollers m^2 of the sheet-delivery mechanism travel back and forth, so as to carry the sheets from the impression-cylinder B to the receiving board or table p^2. The rollers or sheet-delivering carriage m^2 are actuated by the links or arms r^2 s^2. The arms r^2 are keyed to the shaft t^2, which is adapted to turn in bearings in the arms s^2. A spring, w^2, Fig. 5, is coiled about the shaft t^2, and said spring is firmly secured to one of the arms s^2 and also to the shaft t^2. The arms s^2 are keyed to the shaft v^2 of the bevel gear-wheel w^2. A shaft, B', has a bevel-gear, A', engaging the bevel-gear w^2, and another bevel-gear, C', engaging the bevel-gear D' of the shaft E'.

The bevel-gear F' of the shaft E' gears into the bevel-gear G' of the shaft I', which is keyed to the toothed wheel H', to which an oscillating motion is imparted by the rack-bar J'. Said rack-bar J' is oscillated by the crank-pin L' on the cam R.

The free end of the rack-bar J' is adapted to move upon and to be supported by a roller, K', on an arm, M', Fig. 1. Said arm M' is fixed to a shaft stud or pivot, N', adapted to turn in a fixed part of the machine. From said shaft N' extend two arms, O' P'. The roller Q' of the arm P' rests on the edge of a disk or wheel, R', keyed to the shaft I'. Said wheel R' keeps the arms P' M' in such position that the rack-bar J' is held in gear with the toothed wheel H'. In the wheel R' is a notch, S', and when the roller Q' falls into said notch S' the rack-bar J' and the gear-wheel H' are out of gear and the motion of the wheel H' and of the sheet-delivery mechanism stops. To one of the lifting-arms X is secured a lug, T', Fig. 1, which, when the arm X descends, will press on the arm O' and will prevent the roller Q' falling into the notch or recess S', and will thus prevent disengagement of the rack-bar J' and of the gear-wheel H'.

The receiving-board p^2 is supported on arms U' W', adapted to oscillate about pivots V' and X'. Pivots Z' and Y' connect the arms U' W' and the receiving-board p^2. The receiving-board p^2 receives the sheets from the delivery mechanism, and said board p^2 moves toward the cylinder B whenever said board p^2 is to receive a sheet, thus lessening the distance which the sheet-delivery mechanism has to travel in carrying a sheet from the cylinder B to the board p^2.

The pivot V', to which the arms U' are fixed or keyed, is made in form of a shaft, as seen in Fig. 5, to which shaft is keyed or fixed an arm, A^2, Figs. 1 and 5, connected by a pivot, B^2, to a pitman, C^2. A pivot, D^2, connects the pitman C^2 to a bell-crank lever, E^2 F^2, swinging about a pivot, G^2, and having its arm F^2 provided with a weight, H^2, and with a roller, I^2. The roller I^2 rides on a cam, J^2, on the shaft L, and as the low part of the cam comes into proximity with the roller I^2 the weight H^2 causes the arm F^2 to descend, after which the high part of the cam J^2 raises the arm F^2 again. This rising and falling of the arm F^2 causes oscillation of the pitman C^2 and of the table p^2. The motion of the table p^2 can be arrested by a detent, K^2, Fig. 1, swinging about a pivot, L^2, which detent has a notch, N^2, that may be caused to engage the pivot D^2, and thus arrest the motion of the bell-crank lever E^2 F^2. The detent K^2 is actuated by an arm, M^2, secured to one of the levers or arms t' or to their shaft u', and when said arms t' and shaft u' are swung to the position shown in Fig. 8 the arm M^2 is actuated so as to cause the detent K^2 to assume such position that it can engage the pivot D^2. The arm M^2 is made in form of a spring-arm, so that if necessary the detent K^2, when supported by the arm M^2, can yield sufficiently to allow the pivot D^2 to glide into engagement with the detent-notch N^2, after which the spring-arm M^2 will press the notch N^2 into engagement with the pivot D^2, and will keep said parts in such engagement.

The receiving-table p^2 is provided with a ledge, O^2, at its inner edge to prevent the sheets from gliding off said table. The outer or free edge of the table p^2 is open, so as to enable the sheets to be easily removed therefrom, when desired. To prevent sheets coming from the delivery mechanism onto the board or table p^2 from gliding off the front edge of the table p^2

at improper times, I provide stop-fingers P^2, swinging about a shaft or pivot, Q^2. A weight, R^2, tends to keep said fingers in an upright position. The pressure of the table p^2 upon the fingers P^2 will hold said fingers in the position shown in Fig. 1; but when the free edge of the table p^2 has swung past said fingers P^2 in its motion toward the cylinder B, then the weight R^2 causes the fingers P^2 to stand up, so as to stop sheets from gliding off the free edge of the table p^2. The return of the table p^2 to the position shown in Fig. 1 will press the fingers P^2 back to the position shown in said Fig. 1. When not in use, the table p^2 can be swung about the pivot Y′ until a pin or projection, S^3, upon said table is caught and held by the hook S^2, swinging about pivot X′.

By connecting a pin or projection, S^3, Figs. 1 and 5, to the table p^2, in such a position that when the table p^2 is swung so as to carry said pin S^3 toward the hook S^2 said hook will engage and hold said pin, said hook can be made to hold the table up or in a raised position.

In Fig. 5 the hook S^2 is shown as partly broken away, so as to expose to view parts lying behind said hook.

On the impression-cylinder B is a gear-segment, Z^2, Fig. 4. A rack-bar, T^2, Figs 2 and 4, is adapted to engage said segment at certain times when the rack or racks D of the type-bed E are out of gear with the gear wheel or wheels C of the cylinder B, as seen in Fig. 2. The rack-bar T^2 is pivoted at U^2 to the lever V^2, fulcrumed at W^2, and the roller X^2 of which lever is actuated by a cam-groove, Y^2, on the shaft L.

The operation of the machine is as follows: Suppose the parts to be in the position shown in Fig. 2, and the shaft L with the crank K revolving in the direction of arrow 1, Figs. 1 and 2. The action of the crank K will actuate the wheel H, so as to cause the type-bed E to travel from its position shown in Fig. 2 at the front of the press toward the rear of the press and back again to its starting-point. At the moment the type-bed moves forward the roller T enters the cam-groove S, thus allowing the cylinder B to descend, so as to bring its gears C Z^2 into position to engage the racks D T^2. The hook *c*, acting on the arm *k*, locks the toggle-joint *i j*, as seen in Fig. 3ª, and the descent of the arm X and seat Y draws the detent *a* out of engagement with the cylinder B. The cylinder B is then revolved in the direction of arrow 2, Figs. 1 and 2, first by the rack-bar T^2, which is moved by the cam Y^2, and which rack-bar acts on the segment Z^2, and afterward by the racks D, acting on the gears C. The grippers on the cylinder B seize a sheet from the feed-board q^2 and carry it in the direction of arrow 2, so that said sheet is brought into contact with the type, stone, or plates on the type-bed and receives an impression. As the cylinder B continues its revolution, the cylinder-grippers release the edge of the sheet in time for said edge to be seized by the grippers n^2 of the delivery mechanism, the operation of which will be presently described. As the type-bed starts on its return motion to resume the position shown in Fig. 2, the rollers or roller T passes out of the cam-groove S and comes to rest upon the outer edge of the cam R, thereby lifting the cylinder B and causing it to rest on the seats Y, while the detent *a* prevents turning of the cylinder. The type-bed E and the rack-bar T^2 now return to their respective starting-points without actuating the cylinder B, which has been raised out of gear with the racks D T^2. When the type-bed and rack T^2 have reached their starting-point, the cylinder B descends, and the operation of printing another sheet is commenced.

The sheet-delivery is operated as follows: The cam R with the crank-pin L′ revolve in the direction of said arrow 1 and at first actuate the rack-bar J′, so as to cause the gear-wheel w^2 to turn in the direction of arrow 3, Fig. 1, until the arms s^2 r^2 have respectively assumed the position shown by the dotted lines 4 and 5. This motion of the arms s^2 r^2 causes the spring w^2 on the shaft t^2 to be twisted. This torsion of the spring w^2, together with the momentum of the rollers m^2, causes the free end of the arm r^2 to swing forward from the position shown by the dotted line 5, and a sufficient distance toward the table p^2 to get past the dead-center. The rack-bar J′ now moves in the opposite direction, causing the wheel w^2 to revolve in the direction opposite to that of arrow 3, thus carrying the arms s^2 r^2 to the position shown by the dotted lines 6 and 7, Fig. 1. The grippers n^2 of the delivery mechanism, which have seized the printed sheet and taken it off the cylinder B, now rest above the table p^2, and said grippers are opened by the finger o^2 and release the printed sheet, which falls onto the table p^2. Said table p^2 has meanwhile been swung toward the cylinder B for a certain distance, so as to be in position to squarely receive the sheet when it is released by the delivery mechanism, thereby also lessening the distance the delivery mechanism has to travel to deliver a sheet to the table p^2. After receiving a sheet from the delivery mechanism the table p^2 moves forward or away from the cylinder B to its starting-point. The wheel w^2 continues to revolve in the direction opposite to that of arrow 3 until the arms s^2 r^2 have reached the position shown by the dotted lines 8 and 9, whereby the delivery-rollers m^2 are caused to move a certain distance toward the cylinder B. The momentum of the rollers m^2 and the torsion of the spring w^2 carry the arm r^2 sufficiently far from the position shown by dotted line 9 and toward the cylinder B to cause said arm r^2 to pass the dead-center. The rack-bar J′ now reverses its motion and resumes its original motion, thereby causing the wheel w^2 to turn in the direction of arrow 3, and bringing the arms s^2 r^2 back to the position shown by full lines in Fig. 1. The rack-bar J′ is during these motions kept in gear with the wheel H′ by the edge of the disk or wheel R′ and by the lug

T′ on one of the arms X, which lug presses upon the arm O′ at the proper times to prevent the roller Q′ entering the notch S′, whereby the rack J′ would be thrown out of gear with the wheel H′.

Sometimes it may be desired to keep the cylinder B out of gear with the type-bed rack D while the type-bed passes several times back and forth—as, for example, when it is desired to thoroughly distribute ink over the type. For this purpose the treadle f', Fig. 6, is actuated, so as to throw the weight b' from the position occupied by it in Fig. 6 to the position occupied by said weight in Fig. 8, thereby causing the arm w to draw the finger a^2 away from the stop c^2, supporting said finger in Fig. 6 and bringing said finger to rest against the other stop c^2 on the bracket b^2. This motion of the finger a^2, it should be noticed, does not impart motion to the lever v', but said lever v' remains in the position it occupies in Fig. 6 until the pin or lug k^2 on the crank K strikes against the finger a^2, which, by reason of its changed position, now rests in the path of said lug k^2. The pressure of the lug k^2 on the finger a^2 will swing the lever v' away from the crank-shaft L, thereby moving the arms t' r' so as to move the detent o' into engagement with the arm U, as seen in Fig. 8. When the lever v' has been moved to the position shown in Fig. 8, the center of gravity of the lever v' has been carried so far in the direction away from the shaft L that the weight of the lever v', with the weight of the parts connected to said lever, will hold the lever in the position shown in Fig. 8, when the projection h^2 has passed the finger a^2. Said detent o' now prevents the cylinder B from descending upon the type-bed, as said detent o' holds the levers U W and the lifting-arms X in their raised position to hold the cylinder B away from the type-bed. As said detent o' prevents the arms X from descending, the lug T′ on one of the arms X is prevented from pressing onto the arm O′, and as soon as the roller Q′ now comes opposite the recess S′ in the disk R′, the rack-bar J′ drops out of gear with the wheel H′ and the motion of the delivery mechanism is stopped. Also, when the arms t' are in the position shown in Fig. 8 the arm M^2, Fig. 1, presses the detent K^2 into engagement with the pivot D^2, so as to stop the motion of the pitman C^2 and of the receiving-table p^2. The type-bed will now continue to pass back and forth, but without any movement taking place of the cylinder B, the sheet-delivery mechanism, and the receiving-table p^2. To return the parts to the position shown in Fig. 6, the treadle f' is actuated, so that the weight b' is swung back to the position shown in said Fig. 6, whereby the finger a^2 is swung from the stop c^2, against which it rests in Fig. 8, so as to rest against the opposite stop, c^2, whereupon the lug k^2, upon the revolution of the crank K, presses upon the finger a^2, so as to press the lever v' from the position it occupies in Fig. 8 toward the crank-shaft L, thus bringing said lever v' to the position shown in Fig. 6, when the detent o' releases the arm U and allows the roller T to enter the cam-groove S at certain times when the cam R revolves, thus allowing the cylinder B to descend upon the type-bed E.

It should be noticed that the movements of the weight b', actuating the arm w, do not directly actuate the finger a^2, but said arm w actuates the weight j^2 on the lever v', and as said weight j^2 is swung to the position shown in Fig. 6 or Fig. 8, said weight j^2 strikes against one or the other of the fingers e^2, and thereby presses the finger a^2 to one side or the other.

At times it may be desired to have the cylinder B remain out of gear with the type-bed during each alternate reciprocation back and forth of the type-bed. To accomplish this object the pin k', Figs. 6 and 7, is slid into the arm j' until said pin occupies such position that when the weight b' is swung to the position shown in Fig. 8 the pin k' will depress the arm l' and raise the arm s, so as to bring the pins i^2 of the arm o into position to engage the hooks g^2, while at the same time the link t raises the arm w, so as to take the pins h^2 out of engagement with the hooks g^2. When the weight b' is now thrown over from the position shown in Fig. 6 to the position shown in Fig. 9, the finger a^2 is moved to the position shown in Fig. 9 by the arm w before the pin k' reaches the lever l' s. The parts will then be in position shown in Fig. 9. If thereafter the finger a^2 is to be oscillated, then the arm o, being oscillated by the cam m, will throw the finger a^2 to the position shown in Fig. 9 in dotted lines, or to the position shown in said Fig. 9 in full lines, as may be required. When the parts are in the position shown in Fig. 9, and the crank K revolves, then the lug k^2 on said crank will strike against the finger a^2 and will swing the lever v' to the position shown in Fig. 10, so that the detent o' will hold the lever U W and will keep the cylinder B raised from the type-bed. The lever v' and detent o' will remain in this position during one entire revolution of the crank K, during which revolution the type-bed moves once back and forth. When the crank K begins its second revolution, the arm o will have moved the finger a^2 back to the position on the lever v', indicated in dotted lines in Fig. 10, and upon the lug k^2 striking said finger a^2 the lever v' will be moved back to the position shown in Fig. 9, thereby causing the detents o' to release the levers U W, whereupon the cylinder B can descend upon the type-bed and the operation of printing can be proceeded with. An advantage of having the cylinder B in gear with the type-bed only during each alternate oscillation of the type-bed is, that the ink can be thoroughly distributed over the type or plates on the type bed before any printing is done. The spring-actuated arm l' of the lever l' s will allow sufficient yielding of the parts to prevent breakage in case the parts should at times not be in such position that the lever l' s

can cause the pins or lugs i^2 to engage the hooks g^2.

The descent of the arms X, it will be noticed, will cause the hook *c*, Fig. 3, to engage the lever *k* and actuate the toggle-joint *i j*, so as to press the cylinder B firmly against the type-bed in the operation of printing.

In place of only one spring, w^2, applied to the arms $s^2 r^2$, as seen in Fig. 5, two springs—one being near each extremity of the shaft t^2—may be applied.

By having the sheet-delivery carriage, with its ways and its actuator w^2, located above the body of the press the motions of said parts will not prevent or interfere with access to the body of the press.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with an impression-cylinder provided with supporting rims or wheels Z, of a cam-actuated lever, U W, and supporting-arms X, engaged by said lever U W, said supporting-arms X being provided with seats adapted to engage said supporting-rims Z, substantially as set forth.

2. The combination, with an impression-cylinder provided with supporting rims or wheels Z, of a cam-actuated lever, U W, and supporting-arms X, engaged by said lever U W, said supporting-arms X being provided with a detent or stop, *a*, adapted to arrest the motion of the cylinder, and with seats adapted to engage said supporting-rims Z, substantially as set forth.

3. The combination, with an impression-cylinder provided with supporting rims or wheels Z, of a toggle joint, *i j*, adapted to act upon said cylinder, and provided with an actuating arm or lever, *k*, a cam-actuated lever, U W, and supporting-arms X, engaged by said lever U W, said supporting-arms being provided with seats adapted to engage said supporting-rims Z, and with a lug or hook, *c*, adapted to engage the toggle-arm *k*, substantially as set forth.

4. The combination, with an impression cylinder, a toggle-joint adapted to act upon said cylinder, and provided with an actuating arm or lever, *k*, and supporting-arms X, adapted to raise said cylinder, of a hook, *c*, movably secured to said supporting-arms X, and adapted to engage said toggle-actuating arm *k*, and a guide-pin, *e*, made to engage said hook *c*, substantially as set forth.

5. The combination, with an impression-cylinder, a cam-actuated lever, U W, adapted to impart an oscillating motion to said cylinder, and a detent, *o'*, adapted to engage said lever U W, of a detent-actuator, *v'*, an oscillating finger, a^2, carried by said actuator *v'*, an arm or lever, *w*, adapted to actuate said finger a^2, and a crank, K, adapted to engage said finger to move the actuator *v'*, substantially as set forth.

6. The combination, with an impression-cylinder, a cam-actuated lever, U W, adapted to impart a vertical motion to said cylinder, and a detent, *o'*, adapted to engage said lever U W, of a detent-actuator, *v'*, an oscillating finger, a^2, carried by said actuator *v'*, a cam-actuated arm or lever, *o*, adapted to actuate said finger a^2, and a crank, K, adapted to engage said finger to move the actuator *v'*, substantially as set forth.

7. The combination, with an impression-cylinder, a cam-actuated lever, U W, adapted to impart an oscillating motion to said cylinder, and a detent, *o'*, adapted to engage said lever U W, of a detent-actuator, *v'*, an oscillating finger, a^2, carried by said actuator *v'*, an arm or lever, *w*, and a cam-actuated arm or lever, *o*, said arms *w o* being adapted to actuate said finger a^2, a crank, K, adapted to engage said finger to move the actuator *v'*, and mechanism, substantially as set forth, for alternately throwing said arms *w o* into and out of engagement with the finger a^2, substantially as set forth.

8. The combination, with an impression-cylinder, a sheet-delivering carriage or rollers, m^2, and suitable ways for said carriage, of a wheel, w^2, links $s^2 r^2$, made to connect the carriage m^2 and the wheel w^2, and an oscillating rack-bar, J', made through intermediate parts to impart an oscillating rotary motion to said wheel w^2, substantially as set forth.

9. The combination, with an impression-cylinder, a sheet-delivering carriage or rollers, m^2, suitable ways for said carriage, a gear-wheel, w^2, connected to said carriage, and an oscillating rack-bar, J', of oscillating arms M' P', made to support said rack-bar, and a recessed rotating disk, R', made to act upon said arms M' P' to hold the rack-bar in gear with said wheel w^2, substantially as set forth.

10. The combination, with an impression-cylinder, lifting-arms X, made to raise and lower said cylinder, a sheet-delivering carriage or rollers, m^2, suitable ways for said carriage, a gear-wheel, w^2, connected to said carriage, and an oscillating rack-bar, J', of oscillating arms M' P' O', made to support said rack-bar, a lug, T', secured to one of the lifting-arms X, and a recessed rotating disk, R', said disk and lug being made to act upon said arms M' P' O' to hold the rack-bar in gear with said wheel w^2, substantially as set forth.

11. The combination, with an impression-cylinder, a sheet-delivering mechanism, and a delivery or receiving table, p^2, of swinging arms adapted to support the table p^2, and a cam, J^2, adapted to oscillate said swinging arms, substantially as set forth.

12. The combination, with an impression-cylinder, a cam-actuated lever, U W, made to oscillate said cylinder, a detent, *o'*, adapted to engage said lever U W, and detent-actuating mechanism for said detent *o'*, of an arm, M^2, actuated by said detent-actuating mechanism, an oscillating delivery-table, p^2, a cam-actuated lever, E^2 F^2, made to oscillate said table p^2, and a detent, K^2, adapted to engage said lever E^2 F^2 and to be actuated by said arm M^2, substantially as set forth.

13. The combination, with an impression-cylinder, a sheet-delivering carriage or rollers, m^2, and suitable ways for said carriage, of a gear-wheel, w^2, links s^2 r^2, made to connect the carriage m^2 and the wheel w^2, a spring, u^2, secured to said arms s^2 r^2, and an oscillating rack-bar, J′, made, through intermediate parts, to impart an oscillating rotary motion to said wheel w^2, substantially as set forth.

14. In a printing-press, the combination, with the sheet-delivery carriage, and with suitable ways, upon which said carriage moves, a shaft v^2, arms r^2 s^2, a shaft, t^2, to which the arms r^2 are keyed, said shaft turning in bearings in the arms s^2, and a spring, u^2, coiled on said shaft, substantially as described.

15. The combination, with an impression-cylinder, a cam-actuated lever, U W, made to raise and lower said cylinder, an oscillating delivery-table, p^2, and a cam-actuated lever, E^2 F^2, made to oscillate said table p^2, of detents o' K^2, adapted to engage said levers U W and E^2 F^2, and suitable mechanism, substantially as described, for actuating said detents, substantially as set forth.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

MATTHEW VIERENGEL. [L. S.]

Witnesses:

W. C. HAUFF,

E. F. KASTENHUBER.