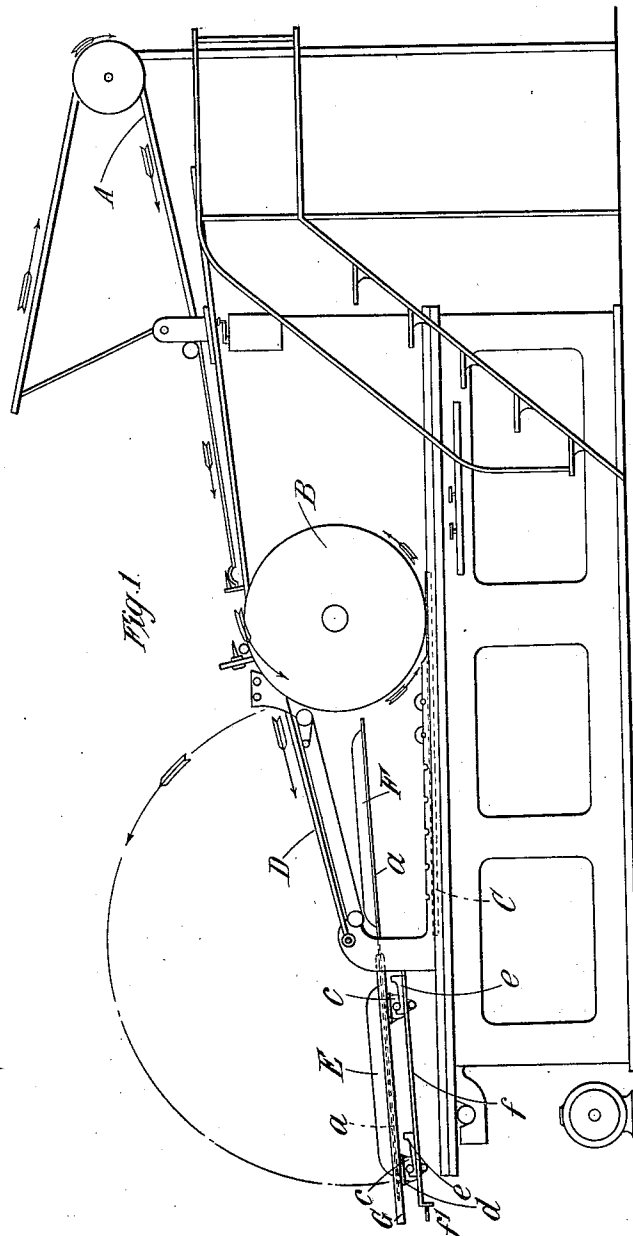


S. C. DAVIS.
 PRINTING MACHINE.
 APPLICATION FILED SEPT. 24, 1910.

Patented Oct. 31, 1911.

3 SHEETS—SHEET 1.

1,007,433.



Witnesses:

H. L. Allen
 E. Barchelder

Inventor:

S. C. Davis
 by Wright & Brown, Quincy, Mass.
 Attys.

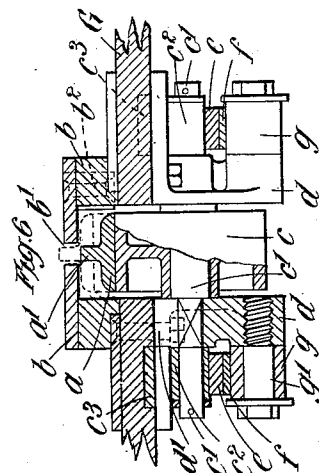
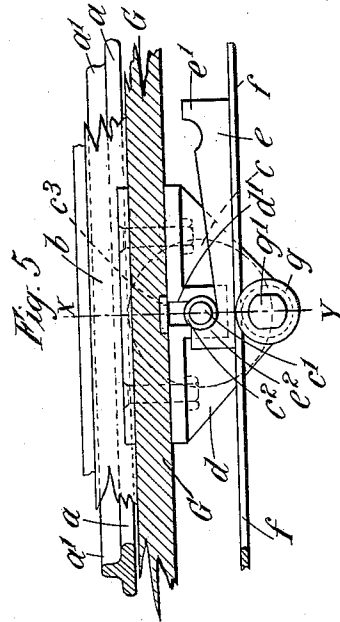
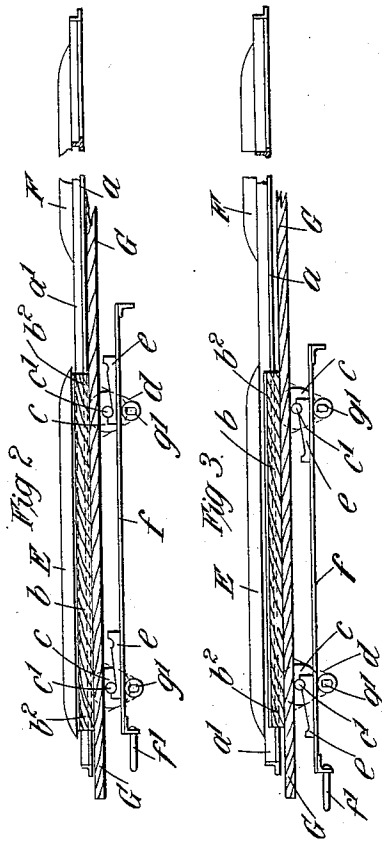
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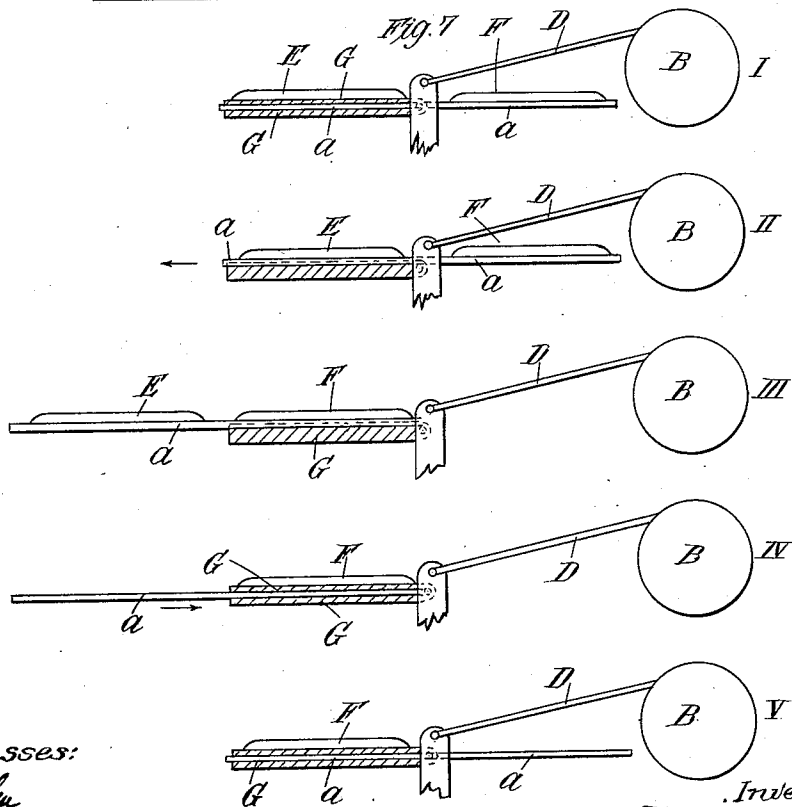
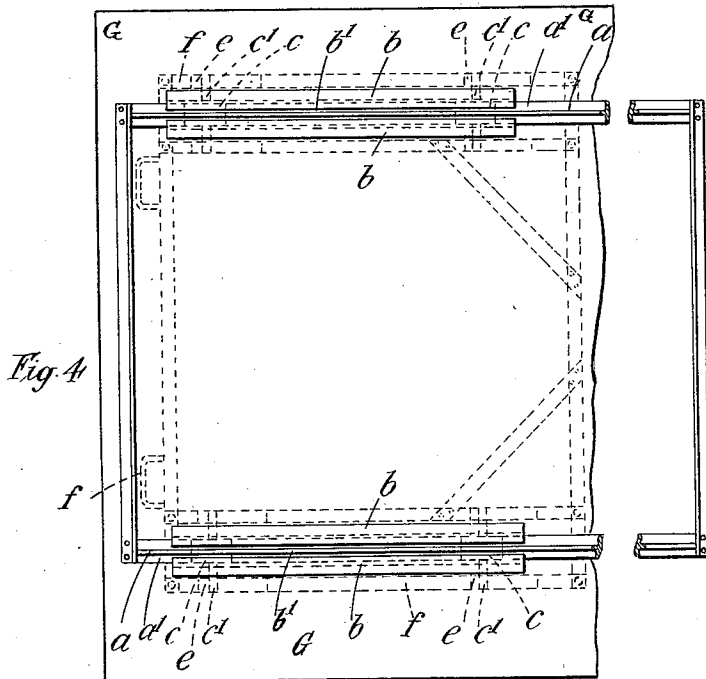
Inventor:
S. C. Davis
by Night Brown & Co. atty.

S. C. DAVIS.
PRINTING MACHINE.
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1,007,433.

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3 SHEETS—SHEET 3.



Witnesses:
H. L. Allen
E. Batsholder

Inventor:
S. C. Davis
by Wright & Brown, Attorneys

UNITED STATES PATENT OFFICE.

SIDNEY CUTHBERT DAVIS, OF SOUTHWARK, ENGLAND, ASSIGNOR OF ONE-HALF TO
THE AMALGAMATED PRESS, LIMITED, OF LONDON, ENGLAND.

PRINTING-MACHINE.

1,007,433.

Specification of Letters Patent.

Patented Oct. 31, 1911.

Application filed September 24, 1910. Serial No. 583,608.

To all whom it may concern:

Be it known that I, SIDNEY CUTHBERT DAVIS, a subject of the King of Great Britain, residing at the Printing Works, Lavington street, Southwark, in the county of London, England, have invented certain new and useful Improvements in and Relating to Printing-Machines, of which the following is a specification.

10 This invention relates to printing machines, more particularly to that class known as "flat bed printing machines" and has for its chief object to provide means whereby the tray which receives the printed sheets as
15 they leave the machine, can be moved from the delivery board when fully loaded, and replaced by an empty tray to receive the work, without stopping the machine to effect the change of trays.

20 According to this invention, a device is provided which is of such a character, that two trays can be placed adjacent each other and in the same horizontal plane or approximately so, on a supporting member or
25 frame so that one tray is receiving the work from the printing machine while the other remains idle, the supporting member or frame being adapted to be moved when a change of trays is necessary, so carrying the
30 trays to a position in which the idle tray receives the work and the other tray can be removed, the said supporting member or frame then being enabled to return to its initial position but without carrying the re-
35 maining tray now receiving the work, thus allowing another tray to be placed on said member or frame in the idle position, ready for the next changing operation, the changing and insertion of a new tray being ef-
40 fected without stopping the machine.

In order that the invention may be clearly understood and readily carried into effect the same will now be described more fully with reference to the accompanying draw-
45 ings in which:—

Figure 1 is a diagrammatic side elevation of a two revolution flat bed printing machine provided with an automatic feed. Fig. 2 is an elevation of the device as at-
50 tached to the delivery board showing a tray supported on the latter. Fig. 3 is a similar view to Fig. 2 but showing the tray supporting member or frame and the tray in the raised position. Fig. 4 is a plan of the de-
55 vice as shown in Fig. 2. Fig. 5 illustrates on

an enlarged scale an elevation of the means employed for raising the tray supporting member. Fig. 6 is a cross sectional view taken on the line X—Y of Fig. 5. Fig. 7 embodies a series of diagrams showing the
60 various positions of the device and trays in relation to the delivery board.

Referring to Fig. 1, A indicates a suitable form of automatic feed device for supplying the sheets to the printing cylinder B. C is the form or type bed which is reciprocated under the cylinder B, the sheets after being carried around with the cylinder are caught by the flier D and delivered on to a
65 tray E supported on the delivery board G. The path of the sheets from the automatic feed A to the tray E is shown by the arrows in this Fig. 1. An empty tray F is supported on a frame or member *a*, in an idle
70 position between the flier shaft and the printing cylinder B. The aforesaid supporting member *a* is in the form of a long rectangular frame, provided with an upwardly projecting ridge *a'* on each of its
75 longer sides. The frame is adapted to be moved over the delivery board G in suitable guides *b* projecting above the delivery board, each guide being provided with a longitudinal slot or opening *b'* into which
80 the aforesaid ridges *a'* on the frame *a* can project. The outer sides of the guides *b* may be each provided with suitable vertical rollers in the locations indicated at *b²* in
85 Figs. 2 and 6 to reduce friction should the frame *a* come in contact with the guides. In the normal or initial position of the
90 frame the ridges do not project above the guides, so that the tray E receiving the work is supported on the delivery board G by resting on the guides *b* while part of the
95 frame *a* extends under the flier D and supports an empty tray F between the flier shaft or rocker, and the printing cylinder B as shown in Figs. 1 and 7. The sheets on
100 leaving the printing cylinder are caught by the flier and placed in the tray E supported on the delivery board in the usual way, and during this operation an empty tray can be placed on that part of the frame *a* between
105 the flier shaft and the printing cylinder.

In order that the frame may operate to carry the receiving tray along the delivery board G when the empty tray F is required to take the place of the receiving tray E the projecting ridges *a'* must be caused to stand
110

above the guides and so raise the tray E. For this purpose the long sides of the frame are supported on two rollers *c* which facilitate the movement, each roller being carried
 5 on a spindle *c'* which is adapted to be raised or lowered in a bracket *d* secured to the under side of the delivery board. The brackets *d* are each provided with a slot *d'* to permit of the upward and downward
 10 movement of the spindle *c'*. The under surface of the delivery board is cut away at *c³* to allow the spindle *c'* to be raised sufficiently to cause the ridges *a'* on the frame *a* to project above the guide *b* as shown in
 15 Fig. 6. The spindles *c'* are normally supported in the lowered position but they may be raised by the movement of suitable inclined or cam surfaces *e* causing said rollers to be raised to lift the frame. The inclined
 20 or cam surfaces may be mounted on an under frame *f* supported on rollers *g* mounted on fixed studs *g'* extending from the aforesaid brackets *d* the said under-frame being provided at the outer end with
 25 handles *f'* *f²* by which it can be moved. When the underframe *f* is moved in one direction the aforesaid movable spindles *c'* are raised by the inclined surfaces and lowered when the under-frame is moved in the
 30 opposite direction. The movable spindles are provided with rollers *c²* which engage the inclined surfaces to facilitate movement, and each of the inclined surfaces is provided with a depression *e'*, at the highest
 35 point of the incline, in order that the spindles *c'* may rest in said depressions to support the frame *a* in the raised position, while the lowest point of the incline is formed with a projection *c²* so that the
 40 spindles rest against this projection to support the frame *a* in the lowered position.

Referring to Fig. 7 the diagram I indicates the normal or initial position of the device in which position the receiving tray
 45 E is supported on the delivery board G, while an empty tray F is supported on the frame *a* in the idle position. In the diagram II the frame *a* is shown in the raised position and lifting the tray E from the delivery board, although the latter is still
 50 in position for receiving the sheets from the flier D. When the frame *a* is so raised it is moved in a longitudinal direction in the direction of the arrow and thus carries the
 55 two trays to a new position (see diagram III) in which the idle tray F now receives the sheets from the flier, and the fully loaded tray E can be removed. The next operation is to lower the frame *a* so that the
 60 tray F is deposited on the delivery board, as shown in diagram IV, thus enabling the frame to be moved in the opposite direction to be returned to its normal or initial position (see diagram V) so that another empty
 65 tray can be placed on the frame *a* in the

idle position before the tray now receiving is fully loaded, ready for the next change. It will be seen that the changing operation is effected without stopping the machine as immediately the fully loaded tray is moved
 75 an empty tray takes its place.

It is preferable to provide an automatic feed to be used in conjunction with the tray changing device, so enabling the printing machine to be run continuously for a
 75 considerable length of time.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A sheet receiving apparatus comprising a carrier for two trays in substantially
 80 the same plane, and means whereby said carrier may be reciprocated to permit it to be shifted to substitute an empty tray for a filled one in receiving position, means being provided for retaining the substituted tray
 85 in receiving position during backward movement of the carrier to position to take another empty tray.

2. A sheet receiving apparatus comprising a carrier for two trays in substantially
 90 the same plane, and means whereby said carrier may be reciprocated to permit it to be shifted to substitute an empty tray for a filled one in receiving position, means being provided for retaining the substituted
 95 tray in receiving position while the carrier is shifted back to take another empty tray, said retaining means comprising a stationary support, the carrier having means for altering its height relatively to said
 100 support.

3. A sheet receiving apparatus comprising a stationary support for a tray, a carrier for two trays in substantially the same
 105 plane, said carrier being mounted to reciprocate relatively to said support, and means for altering the height of the carrier to cause it to lift one tray from the support and, after being shifted, deposit another
 110 tray thereon.

4. A sheet receiving apparatus comprising an inclined stationary support for a tray, a carrier for two trays in substantially
 115 the same plane, said carrier being mounted to reciprocate relatively to said support, the bearings for the carrier being inclined, and means for altering the height of the carrier to cause it to lift one tray from the support and, after being shifted,
 120 deposit another tray thereon.

5. A sheet receiving apparatus comprising an inclined stationary support for a tray, a carrier for two trays in substantially
 125 the same plane, said carrier being mounted to reciprocate relatively to said support, the bearings for the carrier being inclined, and means for altering the height of the carrier to cause it to lift one tray from the support and, after being shifted,
 130 deposit another tray thereon, rollers being provided to sup-

port the weight of the carrier whereby, when the carrier is raised to lift a filled tray from the said stationary support, its movement to deliver the filled tray and substitute an empty one therefor, will be facilitated.

6. In a printing machine the combination with a delivery board, of brackets secured thereto, a supporting member movably mounted in each of said brackets, a longitudinally movable tray carrying frame supported on said members, and means for raising the supporting members to cause the tray carrying member to project above the delivery board.

7. In a printing machine the combination with a delivery board of brackets secured thereto, a supporting roller movably mounted in each of said brackets, tray supporting guides secured to said delivery board, a longitudinally movable tray carrying frame supported on said rollers and within said guides, upwardly projecting ridges on said frame, and means for raising said rollers to cause the said ridges to project above the guides on the delivery board.

8. In a printing machine the combination with a delivery board, of brackets secured thereto, a supporting member movably mounted in each of said brackets, a longitudinally movable tray carrying frame supported on said members, a movable under-frame supporting said members, and means on said under-frame for vertically moving said members when the under-frame is moved.

9. In a printing machine the combination with a delivery board, of brackets secured thereto, a supporting roller movably mounted in each of said brackets, tray supporting guides also secured to the delivery board, a longitudinally movable tray carrying frame supported on said rollers and within said guides, upwardly projecting ridges on said frame, a longitudinally movable under-frame, fixed members on said brackets for carrying said under-frame, inclined surfaces on said under-frame, a spindle for each of said rollers supported on said in-

clined surface, and means for moving said under-frame in one direction so that the roller spindles are raised by said inclined surfaces, in the other direction to allow the rollers to drop to the lowermost position.

10. In a printing machine, the combination with a delivery board of a longitudinally movable tray carrying frame, vertically movable rollers for supporting said frame, brackets on the delivery board for guiding said rollers, fixed studs on said brackets, an elongated spindle for each of said rollers, a longitudinally movable under-frame supported between said fixed studs and the roller spindles, inclined surfaces on said under-frame on which said roller spindles are supported a depression at the highest point of each of said inclined surfaces, in which the roller-spindles are retained in the highest position and a projection at the lowest point of each of said inclined to retain the roller spindles in the lowered position.

11. In a printing machine the combination with a delivery board, of tray supporting guides mounted thereon and each provided with a longitudinal opening, brackets secured to the delivery board, a vertically movable roller mounted in each of said brackets for supporting said frame, a longitudinally movable frame supported on said rollers and mounted within said guides upwardly projecting longitudinal ridges on said frame, elongated spindles for said rollers, friction rollers therefor, fixed studs on said brackets, friction rollers therefor, a longitudinally movable under-frame supported between said fixed stud and the roller spindles inclined surfaces on said under-frame on which the roller spindles are supported, a depression at the highest point of each of said inclined surfaces, and a projection at the lowest point of each of the latter.

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

SIDNEY CUTHBERT DAVIS.

Witnesses:

T. SELBY WUDLE,

J. WILLIAM PATCHING.