No. 615,636. Patented Dec. 6, 1898.

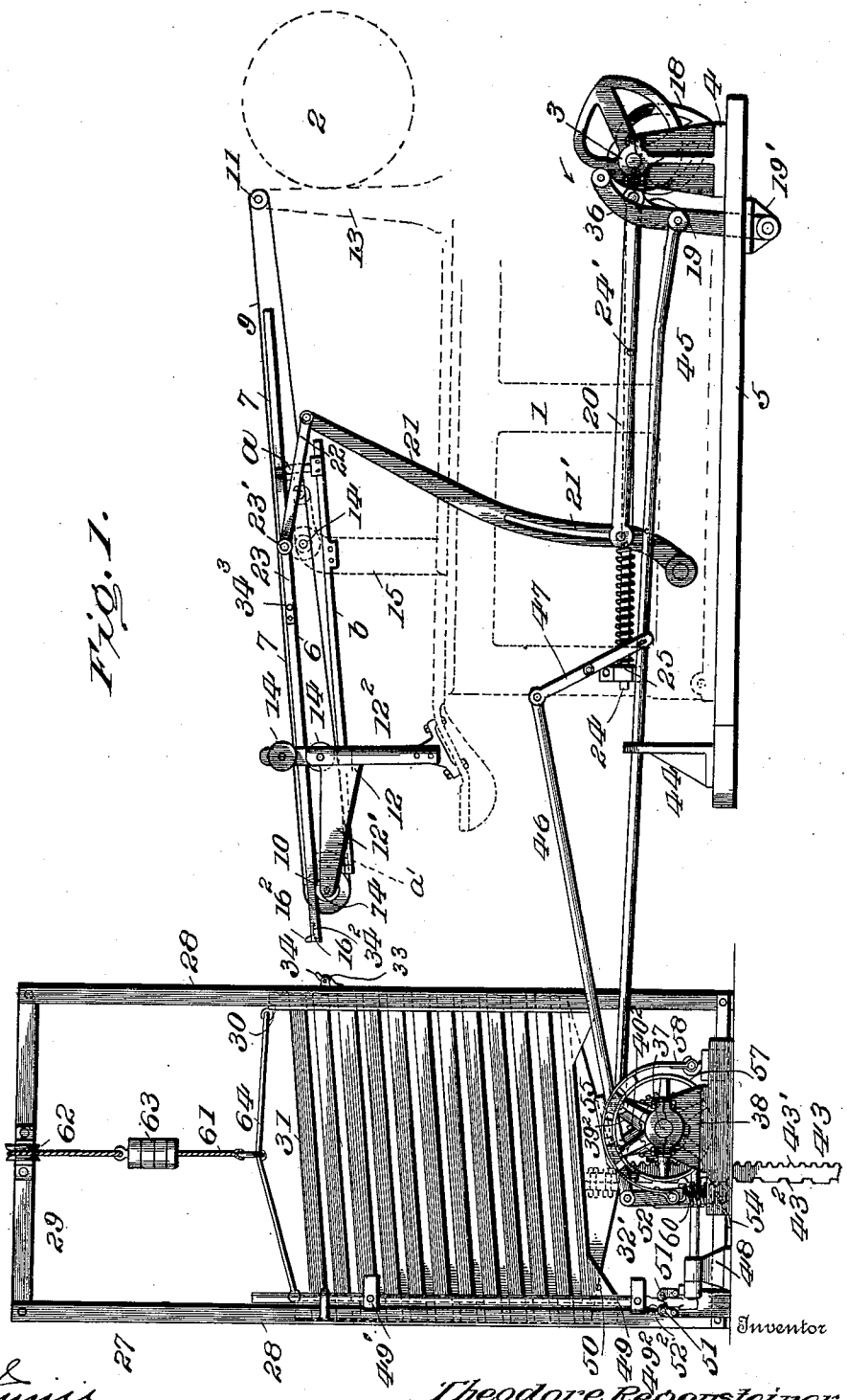
T. REGENSTEINER.

ANTI-OFFSETTING APPARATUS FOR PRINTING PRESSES.

(Application filed Nov. 13, 1897.)

(No Model.) 6 Sheets—Sheet 1.

Fig. 1.



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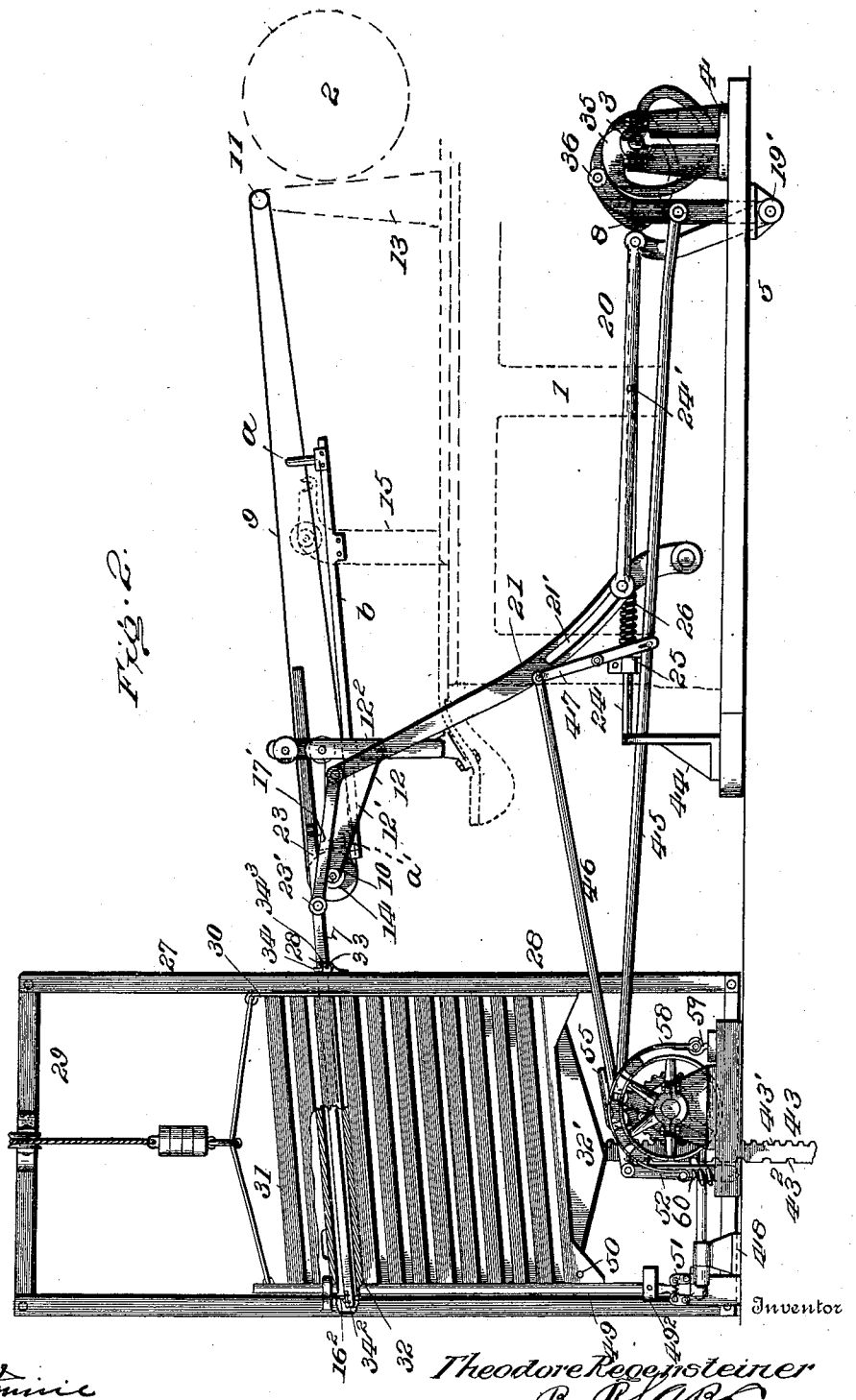
(No Model.) 6 Sheets—Sheet 2.

Fig. 2.



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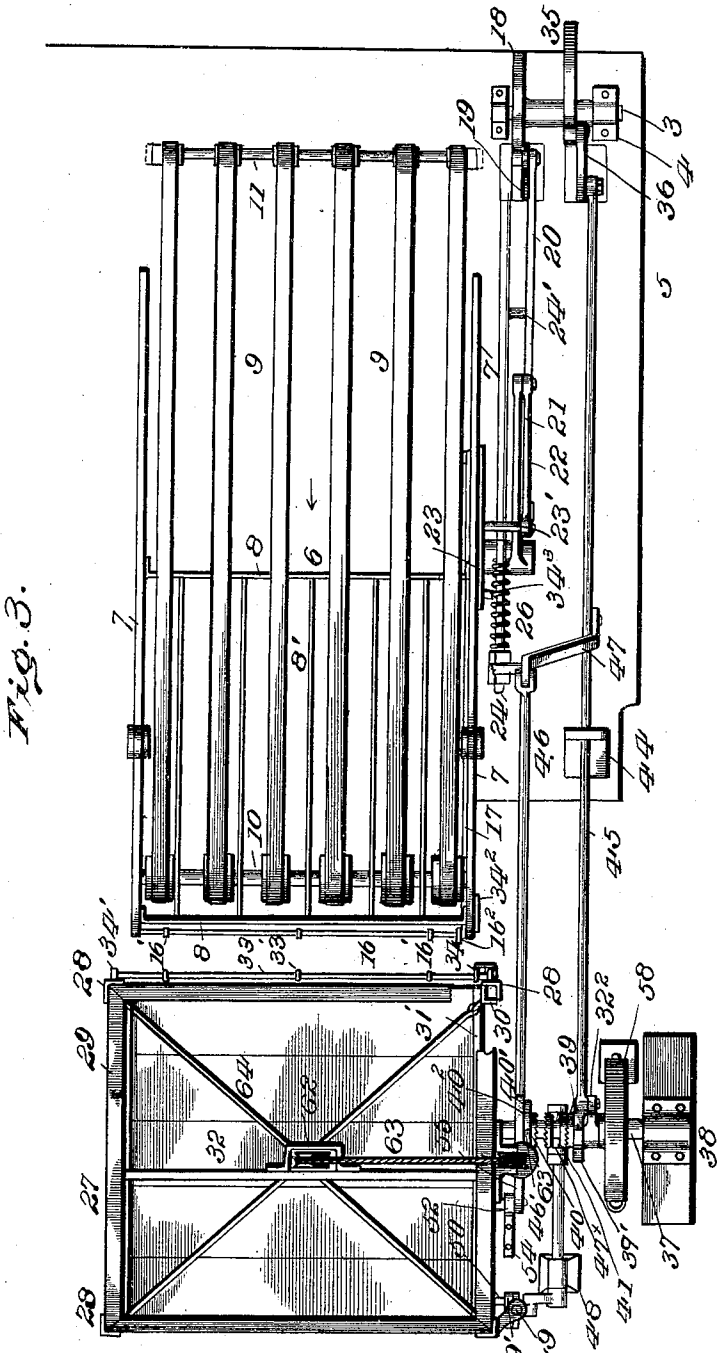
(No Model.) 6 Sheets—Sheet 3.

Fig. 3.



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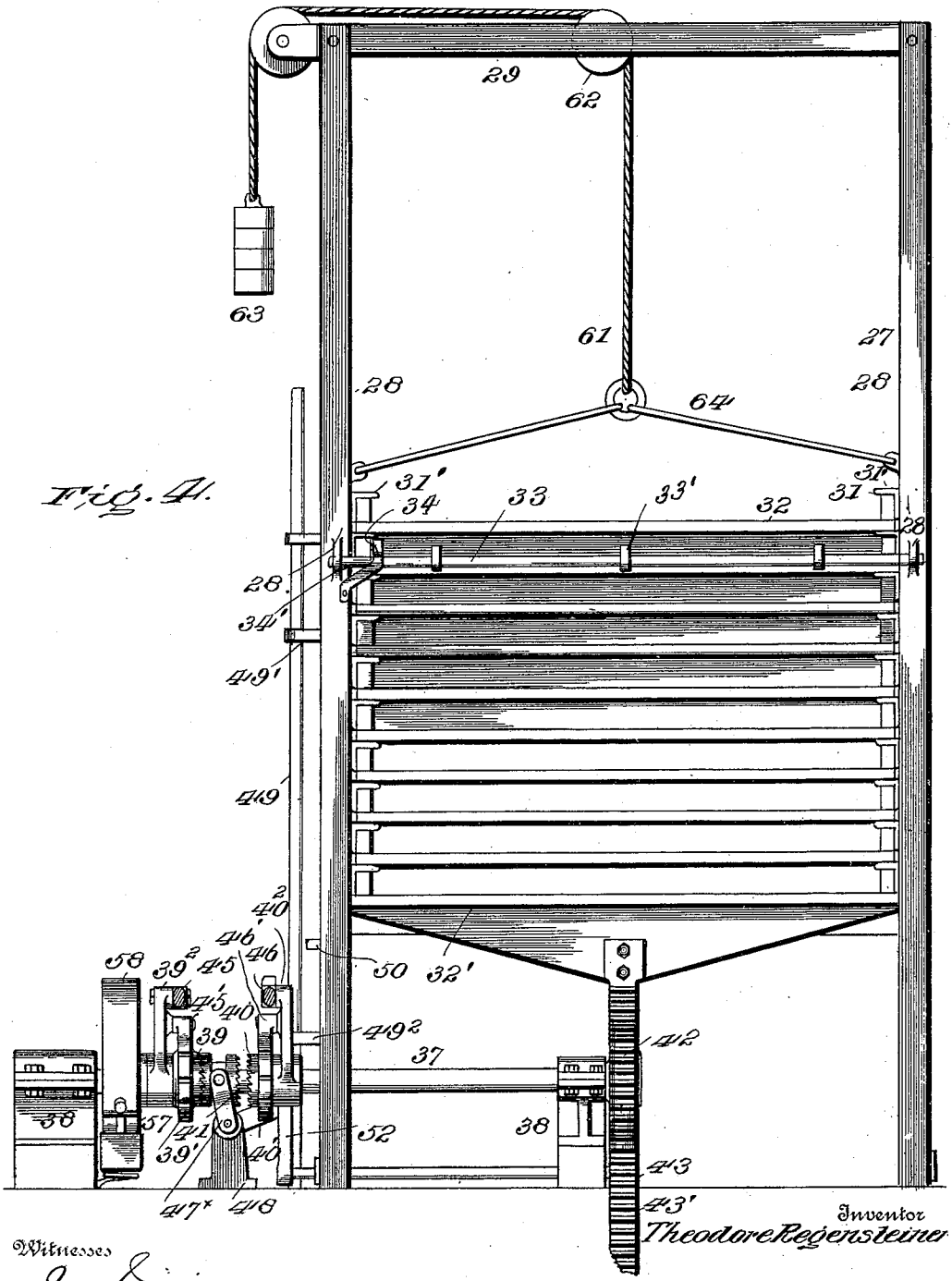
(No Model.) 6 Sheets—Sheet 4.

Fig. 4.



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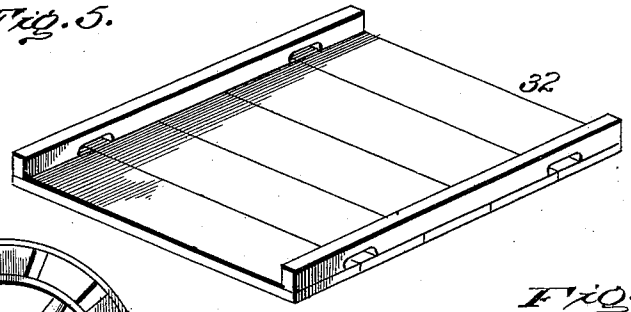
(No Model.) 6 Sheets—Sheet 5.

Fig. 5.



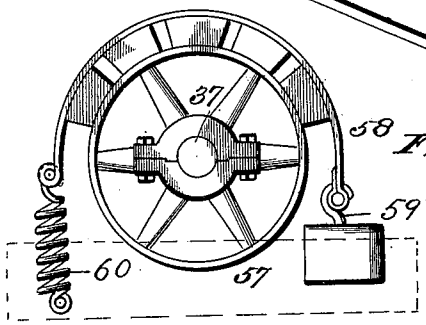


Fig. 6.

Fig. 11.

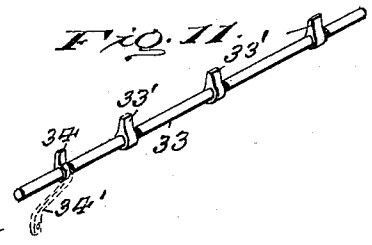


Fig. 7.

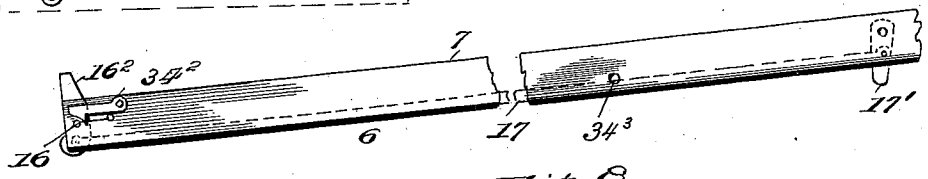


Fig. 8.

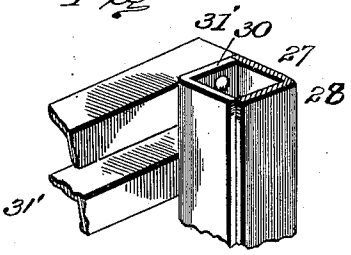


Fig. 9.

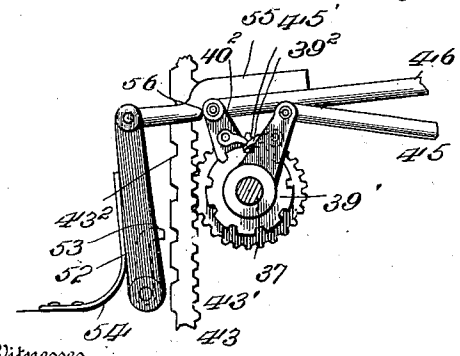
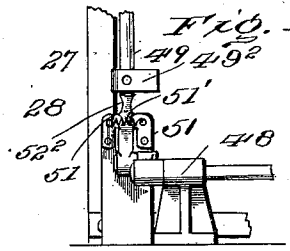


Fig. 10.



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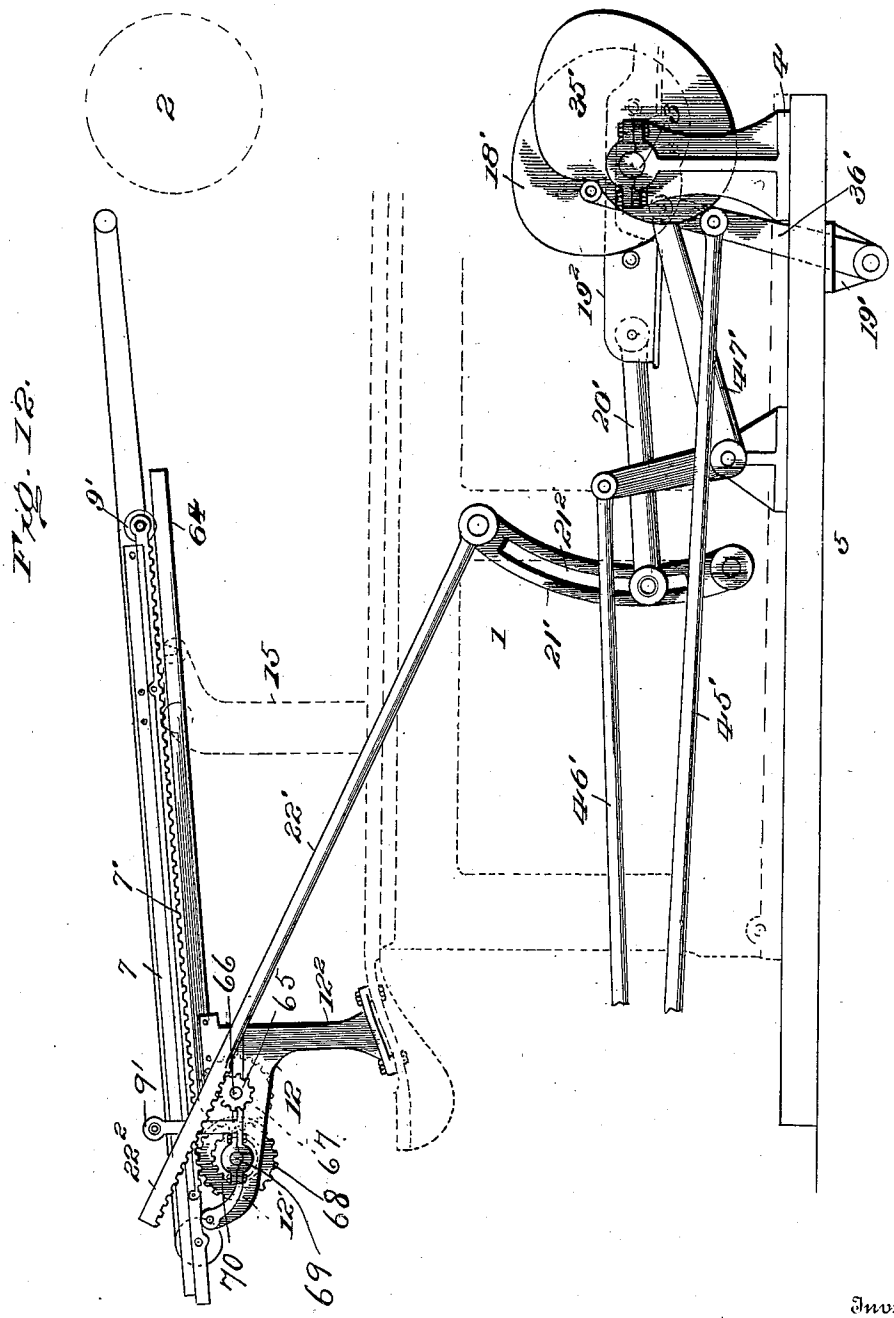
(No Model.) 6 Sheets—Sheet 6.

Fig. 12.



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UNITED STATES PATENT OFFICE.

THEODORE REGENSTEINER, OF CHICAGO, ILLINOIS.

ANTI-OFFSETTING APPARATUS FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 615,636, dated December 6, 1898.

Application filed November 13, 1897. Serial No. 658,430. (No model.)

To all whom it may concern:

Be it known that I, THEODORE REGENSTEINER, 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 Anti-Offsetting Apparatus for 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 an apparatus for delivering printed sheets from a printing-press to trays or receptacles in which said sheets are laid to dry and preventing the objectionable offsetting of ink from one printed sheet onto the other.

It has been a difficult matter, especially in lithographing and other heavy-color printing, to avoid offsetting of the wet ink from the faces onto the backs of printed sheets after they have been piled up on the delivery-board owing to the increasing weight of the pile as the printed sheets are successively laid thereon. It is necessary to avoid this difficulty, particularly on a good class of work, and this has been heretofore more or less successfully accomplished by either interposing an interleaf between each printed sheet and its superimposed sheet, which is objectionable in that attendants are required to insert and remove the interleaves for each successive printing operation in applying the different colors, or by laying the sheets in trays, a small pile of from six to fifty sheets, according to the amount of color used, being laid in each tray, which operation is impracticable in crowded printing establishments or where the capacity of the press is from six to seven thousand sheets a day on account of the large number of trays required and the great amount of space occupied thereby.

The object of my invention is to provide an anti-offsetting apparatus by which these crude, objectionable, and laborious operations may be obviated, floor-space economized, and the operation of delivering the printed sheets to the drying-trays performed automatically, rapidly, and economically.

In order to make my invention more fully understood, I have shown in the accompanying drawings certain means for carrying the same into practical effect, without, however, intending to limit the invention to the particular constructions which for the sake of illustration I have set forth.

In the said drawings, Figure 1 represents a side elevation showing in broken lines a portion of the frame of a printing-press and in full lines my improved anti-offsetting apparatus, the carrier being in operative position to receive a printed sheet from the cylinder. Fig. 2 also represents a side elevation, but shows the carrier in the act of delivering the printed sheet to a tray; Fig. 3, a top plan view of the parts in position shown in Fig. 1. Fig. 4 is a front elevation of the tray frame or rack and shows the gearing for intermittently moving the same step by step; Fig. 5, a perspective view of one of the trays; Fig. 6, a detail of the band-brake; Fig. 7, a broken side view of the carrier on an enlarged scale; Fig. 8, a detail view of a portion of the tray-holder. Fig. 9 is an enlarged detail view of the tray raising and lowering mechanism and clutch devices for reversing the movement of the same; Fig. 10, a detail view showing the mechanism for holding the sliding clutch-jaw in position. Fig. 11 is a detail perspective view of the transverse rod or shaft 33 and connections. Fig. 12 is a side elevational view disclosing a modification in the carrier and mechanism for operating the same.

Referring now more particularly to the said drawings, the numeral 1 represents a portion of the frame of a printing-press, and 2 the delivery-cylinder thereof, around which the printed sheet of paper passes as it issues from the press. Below the said cylinder is a transverse shaft 3, mounted in bearings of standards 4, rising from the bed-plate 5. The elements just described form part of a Miehle front-delivery press and are shown for the purpose of illustrating the application and mode of operation of my invention.

In carrying out my invention I provide a carrier or delivery frame 6 to convey the printed sheets from the cylinder 2 to the trays or receptacles. This carrier consists of two parallel longitudinal side bars 7, connected at their front ends and intermediate of their length by cross-bars 8, and a series of longitudinal sticks or slats 8′, extending between said cross-bars.

The printed sheets as they leave the cylinder fall upon a series of endless belts or bands 9, which pass around fixed pulleys on continuously-running transverse shafts 10 11. The said shaft 10 is located adjacent to the outer end of the carrier rack or frame and journaled in the horizontal arms 12′ of inverted-L-shaped brackets 12, rising from the frame 1, while the shaft 11 has bearing in brackets 13, located adjacent to the cylinder 2 and also rising from said frame. The carrier is supported so as to reciprocate toward and away from the tray rack or frame, hereinafter described, upon rollers 14, mounted on the shaft 10, the vertical arm 12^2 of the bracket 12, and a bracket or standard 15. The side bars 7 of the carrier run upon these rollers, and preferably each bracket 12 will be provided with a pair of rollers, one arranged above and the other below the bar 7, as shown, to prevent the carrier from tilting upward out of its determined plane of reciprocation. At the outer end of the carrier is a rod 16, which extends parallel with the outer cross-bar 8 and is mounted to tilt or oscillate in the side bars 7. This rod is provided with a series of upwardly-projecting stop-lugs 16′ and an end stop-lug 16^2, having its lower end projecting below the rod, and the function of these lugs is to arrest the progress of the printed sheet and prevent it from sliding off the carrier. To the lower end of the stop-lug 16^2 is connected one end of a retractor-rod 17, extending along the inner side of the bar 7 and having its other end jointed to a pendent latch 17′, pivoted to said bar. The function of this rod and latch is to turn down the stop-lugs 16′ 16^2 to permit the printed sheet to slide off the carrier into a delivery-tray and to reset them to receive the next printed sheet received by the carrier from the cylinder 2, as will be hereinafter more fully described.

At the instant the printed sheet is arrested by the stop-lugs 16′ 16^2 the carrier is moved forward in the direction of the arrow shown in Fig. 3. The mechanism for effecting this comprises a heart-cam 18, fixed to the shaft 3. This cam has its face bearing against the upper end of a lever 19, pivoted at its lower end to a block 19′ on the bed-plate 5, and at each revolution when its point comes into contact with said lever forces the latter forward. A rod 20 connects the said cam-lever with an operating-lever 21, pivoted at its lower end and jointed at its upper end to one end of a link or lever arm 22, which latter has its other end pivotally attached to a pin 23′, projecting laterally from a plate 23, secured to one of the side bars 7 of the carrier 6. The operating-lever is formed with a slot 21′, in which the pin on the end of the rod 20, connected therewith, is adapted to be adjusted, whereby the stroke of said lever may be regulated according to the size of the sheet being printed. By this construction it will be seen that when the point of the heart-cam forces the lever 19 forward the carrier 6, through the medium of the connecting-rod 20, lever 21, and arm 22, will also be moved forward in the direction of the arrow shown in Fig. 3 and that the extent of its movement may be varied by means of the adjustable connection between the said connecting-rod and operating-lever.

The carrier is returned to its normal operative position by a retractor-rod 24, movable in guides 25 and connected with the connecting-rod 20 by a pin 24′. A spiral spring 26 encompasses the rod and has one of its ends connected therewith and its other end free and adapted to abut against the forward guide 25. When the rods 20 24 move forward, this spring is compressed, and when the point of the cam leaves the face of the lever 19 the spring expands and forces the said rods, and consequently the carrier, back to their normal operative positions in readiness to receive and deliver another printed sheet to the trays. This construction of retractor device, however, is not essential, as I contemplate providing the lever 19 with a pin to operate in a slot in the cam, so as to cause the cam to both project and retract the carrier.

The tray-holder comprises an inclosing frame 27, consisting of four standards or corner-posts 28, preferably made of angle-iron and connected at top and bottom by angle-iron cross plates or bars 29. In this frame slides a rectangular tray rack or support consisting of four angle-iron uprights 30, connected by angle-iron side plates 31, which are spaced apart to admit of the insertion of the trays between them. The vertical webs of these side plates are bolted or riveted to the uprights 30, while the horizontal webs 31′ thereof serve as ledges to support the trays, as clearly shown in Fig. 4. This rack is adapted to receive a series of trays—say twelve or more. The trays 32 are preferably formed with a bottom and two side pieces having hand hold-openings, but without end pieces, although, if desired, each tray may be provided with one end piece and left open at the other end to receive the printed sheets. The bottom tray may be made fixed or immovable, if desired, in the form of a follower-platform 32′, which supports the rack.

At the front of the frame 27 is a transverse rod or shaft 33, mounted to oscillate in bearings on the standards 28 and having a series of stop-lugs 33′ and a trip-lug 34. Fixed upon one of the said standards is a spring-arm 34′. These lugs are normally held outwardly and upwardly by said spring-arm, as shown in Figs. 1, 3, 4, and 11. The trip-lug 34 projects into the path of a pivoted catch 34^2 and a pin 34^3 on one of the side bars of the carrier. When the carrier is projected or moved outwardly to enter the tray having position in its path, as shown in Fig. 2, the lower end of the lug 16^2 is forced backward by the latch 17′ on the rod 17 abutting against a pin a' on a bar b below the carrier, and the shaft 16 is tilted outwardly and the stop-lugs 16′ 16^2 downwardly, thus permitting the

printed sheet to slide off the carrier onto the tray. Simultaneously therewith the catch 34^2 slides over the trip-lug 34; but as the carrier nears its final traverse the pin 34^3 abuts against said trip-lug and tilts the shaft 33, carrying the lugs 33′, inward. Upon the retraction of said carrier the lugs $16'$ 16^2 are restored to their normal positions by the latch 17′ abutting against the pin *a* on the bar *b*, and the lugs 33′ are righted by the catch 34^2 engaging the trip-lug 34 and tilting the shaft 33 outwardly. The function of the stops 33′ is to retain the delivered printed sheet in the tray and prevent it from being drawn back by the carrier.

Suitable mechanism is provided to move the tray holder or rack up and down in the inclosing frame 27 intermittently step by step to successively bring a different tray into position to receive a printed sheet and also to reverse the direction of movement of the rack after a printed sheet has been delivered to each tray. The object of this is to prevent the too rapid accumulation of the piled-up sheets on the tray and consequently the rapid increase in weight of the pile while the sheets are wet, and also to permit each delivered sheet to dry before its superimposed sheet is placed thereon. For illustration, when the tray holder or rack is moving upward one sheet is first delivered to the first tray. The rack then moves up a step, and another sheet is delivered to the second tray, &c., and this operation is continued until each tray has successively received a sheet, whereupon the motion of the tray holder or rack is reversed and the next sheet will be delivered to the eleventh tray, or the second from the top. From this it will be seen there is always a chance for the wet color on the sheet on one tray to dry to a certain extent during the interval afforded in delivering the eleven succeeding sheets until it receives another sheet on top of it. Therefore the weight of the piled sheets increases very slowly and offsetting is entirely eliminated or reduced to the minimum. As an illustration, where it requires probably only twenty minutes to fill a single tray under the present method, it requires with this machine twelve times twenty minutes or four hours to fill the same, and this time is about sufficient to give the sheets enough chance to dry. At the same time the sheets are delivered rapidly and automatically to the trays, and the services of attendants are dispensed with. The mechanism shown in the present instance for performing this operation will now be described. Mounted on the shaft 3, adjacent to the heart-cam 18, is another heart-cam 35, which acts upon a lever 36, similar to the lever 19 and also pivoted at its lower end to the block 19′. These two cams are mounted upon the said shaft 3 with their points at an angle to each other, so that when one cam is in operation the other will be at rest. Therefore when the cam 18 is at rest and the carrier is being retracted the cam 35 will operate its connections to move the tray holder or rack a step up or down, as the case may be, and vice versa. Adjacent to the tray-holder-inclosing frame is a counter-shaft 37, which has bearing in standards 38 and extends partly into the base of said frame. Mounted loosely on the outer end of this shaft are two clutch jaws or collars 39 40, and between the same is a double clutch jaw or collar 41, working on a feather on said shaft to slide and engage either jaw 39 40. The jaw or collar 39 is provided with a ratchet-wheel 39′ and the jaw 40 with a similar ratchet-wheel 40′, and alongside each clutch-jaw is a loose lever-arm 39^2 40^2. The counter-shaft also carries a gear-wheel 42, which meshes with a rack-bar 43, depending from the follower-platform 32′, said bar being formed at one side edge with teeth 43′, which mesh with said gear-wheel, and at its other side edge with notches 43^2, equal in number to the trays 32 employed.

Working in a guide 44 on the bed-plate 5 is a lowering-rod 45, jointed at an end to the lever 36 and at its other end to the lever-arm 39^2 and provided at this latter end with a pawl 45′, adapted to engage and partially rotate the ratchet-wheel 39′ to the left and slide freely over the same to the right. A shorter raising-rod 46 is connected at its inner end to the said lowering-rod by a pivoted lever 47 and is jointed at its outer end to the lever-arm 40^2 and provided with a pawl 46′, adapted to engage and partially rotate the ratchet-wheel 40′ to the right and to slide freely over the same to the left. The function of the rod 45 is to partially rotate the counter-shaft to the left to lower the tray holder or rack intermittently one step, or the distance of one tray from the other, at a time, and that of the rod 46 to partially rotate the shaft to the right and raise the tray-rack in like manner. These rods move in reverse directions.

The double clutch-jaw 41 is adapted to be shifted by a bell-crank lever $47^\times$, which oscillates in a bearing-block 48 and has one of its arms clamped to said jaw. The other arm of this bell-crank lever is jointed to the lower end of a shifting rod 49, slidable in guides on the tray-holder-inclosing frame 27. This rod carries a pair of tappet-blocks 49′ 49^2, arranged adjacent to its upper and lower ends, respectively, which are adapted to be engaged by a pin 50 on the lower end of the tray rack or holder. When the said tray-rack has reached the limit of its downward movement, the pin 50, abutting against the tappet-block 49^2, forces the shifting rod downward, causing the bell-crank lever 47 to shift the clutch-jaw 41 into engagement with the clutch-jaw 40, whereby each inward movement of the rod 46 will partially rotate the counter-shaft 37 to the right and raise the rack-bar 43 one step. When, however, the tray-rack reaches the limit of its upward movement, the pin 50, abutting against the tappet-block 49′, moves the parts in the reverse direction and shifts

the clutch-jaw 41 into engagement with the clutch-jaw 39, whereupon each outward movement of the rod 45 will partially rotate the counter-shaft to the left and lower the rack-bar one step, as will be readily understood. The drawings show the positions of the parts when the tray-rack is moving downward. Detents 51, pivoted to the frame 27 and connected by a spring 51′, are adapted to snap into pits or sockets 51^2 in the shifting rod and hold the same in either position against accidental movement.

A locking device is provided to firmly hold the rack-bar 43 against movement after the tray-rack has been adjusted to bring a tray into position to receive a printed sheet. This comprises a pivoted locking-lever 52, carrying a fixed pawl 53, adapted to engage either one of the series of notches 43^2 in said bar. A plate or leaf spring 54, bearing against said lever, normally holds it in operative position. Connected to the upper end of this lever is a retractor-arm 55, having a shoulder 56, which normally abuts against the outer end of the rod 46. When the rods 45 46 are moved by the cam 35, the said rod 45, acting on the retractor-arm 55, forces the locking-lever out of engagement with the rack-bar 43, leaving the latter free to be raised or lowered.

In order to prevent undue jarring of the raising and lowering mechanism and any tendency of the rack-bar to slip when the tray-rack is heavily loaded and moving downward, I provide a brake-wheel 57 on the shaft 37 and a band-brake 58, adapted to act thereon. This band-brake is secured at one end to a hook 59, fixed to the standard 38, and at its other end to a stiff spiral spring 60, also secured to said standard and adapted to cause the band-brake to bear on said brake-wheel. On account of the continual increase in weight of the tray rack or holder it is intended to employ a counterbalancing device. This consists in the present instance of a rope or cable 61, passed over pulleys 62 on the frame and carrying at one end a weight 63 and having its other end attached to rods 64, connected with the uprights 30.

In the embodiment of my invention shown in Fig. 12 I employ lever rack-and-gear mechanism as an equivalent of the mechanism shown in the other figures for effecting the movement of the carrier. To this end the carrier is provided with rollers 9′, which traverse rails 64, mounted upon the brackets 12 15. A rack-plate 7′ is secured to one of the side bars 7 of said carrier-rack. The cam 18′ on the shaft 3 bears against a pin or roller on a slide 19^2 and reciprocates said slide. A connecting-rod 20′ has one end jointed to this slide and its other end adjustably connected with a slotted link 21^2. This link is connected with and reciprocates a rack-lever 22′, provided at its upper end with rack-teeth 22^2, as shown, which mesh with a pinion 65 on a shaft 66, having bearing in the bracket. This shaft also carries a gear-wheel 67, (shown in broken lines,) which is in mesh with a gear-wheel 68 on a shaft 69, also having bearing in said bracket, and on this shaft is also mounted a gear-wheel 70, which engages the rack-plate 7′ and reciprocates the carrier. The operative connections of the actuating-rods 45′ 46′ of the raising and lowering mechanism are also modified by connecting one end of the rod 46′ to one arm of a pivoted bell-crank lever 47′ and connecting the other arm of said lever directly to the lever 36′ instead of to the rod 45′, as in the case of the pivoted lever 47 in the other figures. The operation with this construction will be readily understood.

From the above description, taken in connection with the accompanying drawings, it will be seen that my invention provides an apparatus which occupies comparatively little floor-space, performs its operation rapidly, and reduces offsetting of the printed sheets to the minimum. As it is apparent that the details of construction of the tray-holder and carrier-rack and the mechanism for operating the same may be varied and modified, I desire it understood that I do not limit the invention to the specific construction and arrangement of parts herein shown and described. The apparatus may be adapted for application to a front-delivery press, as shown in the present instance, or to a rear-delivery press.

A modification in which the tray-holder is stationary and the carrier-rack adjustable to deliver the printed sheets successively to each tray I regard as subject to and falling within the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, the combination of a tray-holder, a coacting carrier device to convey the printed sheets thereto, mechanism for imparting an intermittent step-by-step movement to said holder, and means for reversing the direction of movement of said mechanism, substantially as described.

2. In an apparatus of the class described, the combination with a printing-press, of a holder or rack, a series of open-ended trays carried thereby, mechanism for imparting an intermittent step-by-step motion to said holder or rack, and a carrier device adapted to receive the printed sheets from the delivery-cylinder of the press and successively move into the open end of each tray to deposit a sheet thereon as the same is brought into operative position by the movement of the holder, substantially as described.

3. In an apparatus of the class described, the combination with a press, of a holder or rack, a series of trays carried thereby, mechanism for imparting an intermittent, step-by-step motion to said holder or rack, reversing mechanism to shift said intermittent, step-by-step mechanism to cause the latter to move

the tray-holder either up or down, and a carrier device adapted to receive the printed sheets from the press and deliver a sheet to each tray as it moves into position to receive the sheet therefrom, substantially as described.

4. The combination with a delivery-cylinder, of a tray holder or rack, trays carried thereby, mechanism for imparting an intermittent step-by-step motion to said holder or rack, reversing mechanism to shift said intermittent step-by-step mechanism to cause the latter to move the tray-holder either up or down, a carrier device movable toward or from said tray-holder and adapted to enter the same to successively deposit a printed sheet on each tray as the latter is moved into operative position, and means for conveying the printed sheets from said holder to the carrier device, substantially as described.

5. The combination with the delivery-cylinder of a printing-press, of a tray holder or rack open at one side and having an intermittent step-by-step motion, a series of trays carried by said holder and adapted to be successively brought into operative position as the holder moves, a reciprocating carrier device adapted to enter the open side of the holder between two adjacent trays and deliver a printed sheet successively onto the lowermost of said adjacent trays as the latter is brought into operative position, and means for conveying the printed sheets from said cylinder to the carrier device, substantially as described.

6. The combination, with the delivery-cylinder of a printing-press, of a tray holder or rack having an intermittent, step-by-step motion and reversible to move either up or down, trays carried thereby, and a carrier device adapted to receive the printed sheets from the cylinder and successively deliver a single sheet to each of said trays, substantially as described.

7. In an anti-offsetting apparatus, the combination with the delivery-cylinder of a printing-press, of a tray holder or rack, a carrier device movable to and from said rack to deliver printed sheets to the trays thereon, means for conveying the printed sheets from the cylinder to the carrier device, a movable stop on the carrier device to hold a sheet thereon, and a stop device on the tray-holder frame adapted to retract the said stop on the carrier device to permit the sheet to slide from the latter onto a tray, and to prevent the deposited sheet from being moved outward by said carrier device, substantially as described.

8. In anti-offsetting apparatus, the combination, with the frame of a printing-press, and the delivery-cylinder thereof, of a tray frame or rack movable up and down step by step in guides arranged alongside said frame, a series of superimposed trays carried by said rack, a carrier device mounted on the press-frame and adapted to convey the printed sheets from the cylinder to the trays, and mechanism actuated by the running-gear of the press for reciprocating said carrier device, substantially as described.

9. In anti-offsetting apparatus, the combination, with the frame of a printing-press, of a tray-holder having a depending rack-bar, a series of superimposed trays carried by said rack, a counter-shaft below the tray-holder carrying a gear meshing with said rack, operative connections between said shaft and a shaft on the press-frame, a clutch device to reverse the motion of said gear and tray-holder, and a carrier to convey the printed sheets from the press to said trays, substantially as described.

10. In an anti-offsetting apparatus, the combination of a tray-holder, a series of superimposed open-ended trays carried thereby, and a reciprocating carrier adapted to move into the open end of a tray and deposit a printed sheet thereon, substantially as described.

11. In an anti-offsetting apparatus, the combination, with the frame of a printing-press, of a tray-holder having a depending rack-bar, a series of superimposed trays carried by said rack, a counter-shaft below the tray-holder carrying a gear meshing with said rack, operative connections between said shaft and a shaft on the press-frame, a clutch device to reverse the motion of said gear and tray-holder, automatic mechanism for shifting said clutch device to reverse the tray-holder after a printed sheet has been deposited on the upper or lower tray, and a carrier to convey the printed sheets from the press to said trays, substantially as described.

12. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder moving in a guide-frame, a counter-shaft below the tray-holder and operatively connected therewith to move the latter either up or down, a series of trays carried by said holder, mechanism connecting said shaft with a shaft on the press-frame to intermittently partly rotate the same and move the tray-holder a predetermined distance, a clutch device for reversing the direction of rotation of said shaft, an automatic clutch-shifting device actuated by the tray-holder, and a carrier to deliver the printed sheets from the press to said trays, substantially as described.

13. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder moving in a guide-frame, a counter-shaft below the tray-holder and operatively connected therewith to move the latter either up or down, a series of trays carried by said holder, mechanism connecting said shaft with a shaft on the press-frame to intermittently partly rotate the same and move the tray-holder a predetermined distance, a clutch device for reversing the direction of rotation of said shaft, a movable shifting rod on the guide-frame, a connection between said shifting rod and the movable clutch-jaw of the clutch device, a contact-piece on the tray-holder to actuate said shifting rod, and a carrier to deliver the print-

ed sheets from the press to said trays, substantially as described.

14. In an anti-offsetting apparatus, the combination with the frame of a printing-press, of a tray-holder having a depending rack-bar, a series of superimposed trays carried by said holder, a counter-shaft below the tray-holder carrying a gear meshing with said rack, operative connections between said shaft and a shaft on the press-frame, a clutch device to reverse the motion of said gear and tray-holder, a band-brake acting on said counter-shaft, and a carrier to convey the printed sheets from the press to said trays, substantially as described.

15. In an anti-offsetting apparatus, the combination with the frame of a printing-press, of a tray-holder having a depending rack-bar, a series of superimposed trays carried by said holder, a counter-shaft below the tray-holder carrying a gear meshing with said rack, operative connections between said shaft and a shaft on the press-frame, a clutch device to reverse the motion of said gear and tray-holder, a band-brake acting on said counter-shaft, a counterbalance-weight connected with the tray-holder, and a carrier to convey the printed sheets from the press to said trays, substantially as described.

16. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder moving in a guide-frame, a counter-shaft below the tray-holder and operatively connected therewith to move the latter either up or down, a series of trays carried by said holder, mechanism connecting said shaft with a shaft on the press-frame to intermittently partly rotate the same and move the tray-holder a predetermined distance, a clutch device for reversing the direction of rotation of said shaft, an automatic clutch-shifting device actuated by the tray-holder, a band-brake acting on said counter-shaft, and a carrier to deliver the printed sheets from the press to said trays, substantially as described.

17. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder moving in a guide-frame, a counter-shaft below the tray-holder and operatively connected therewith to move the latter either up or down, a series of trays carried by said holder, mechanism connecting said shaft with a shaft on the press-frame to intermittently partly rotate the same and move the tray-holder a predetermined distance, a clutch device for reversing the direction of rotation of said shaft, an automatic clutch-shifting device actuated by the tray-holder, a band-brake acting on said counter-shaft, a counterbalance-weight connected with the tray-holder, and a carrier to deliver the printed sheets from the press to said trays, substantially as described.

18. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder moving in a guide-frame, a counter-shaft below the tray-holder and operatively connected therewith to move the latter either up or down, a series of trays carried by said holder, mechanism connecting said shaft with a shaft on the press-frame to intermittently partly rotate the same and move the tray-holder a predetermined distance, a clutch device for reversing the direction of rotation of said shaft, a bell-crank lever having one of its arms connected with the movable jaw of said clutch device, a shifting rod movable in guides on the guide-frame and carrying contact-blocks and having its lower end jointed to the other arm of said bell-crank lever, a tappet-pin on the tray-holder adapted to contact with said blocks and move the rod, and a carrier to deliver the printed sheets from the press to said trays, substantially as described.

19. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder moving in a guide-frame, a counter-shaft below the tray-holder and operatively connected therewith to move the latter either up or down, a series of trays carried by said holder, mechanism connecting said shaft with a shaft on the press-frame to intermittently partly rotate the same and move the tray-holder a predetermined distance, a clutch device for reversing the direction of rotation of said shaft, a bell-crank lever having one of its arms connected with the movable jaw of said clutch device, a shifting rod movable in guides on the guide-frame and carrying contact-blocks and having its lower end jointed to the other arm of said bell-crank lever, a tappet-pin on the tray-holder adapted to contact with said blocks and move the rod, a band-brake acting on said counter-shaft, a counterbalance-weight connected with the tray-holder, and a carrier to deliver the printed sheets from the press to said trays, substantially as described.

20. In an anti-offsetting apparatus, the combination of a guide-frame, a tray-holder movable in said frame, and comprising uprights connected by spaced angle-irons having their vertical webs secured to said uprights and their horizontal webs serving as ledges, an open-ended tray adapted to rest on the said ledges, mechanism for imparting an intermittent, step-by-step movement to said holder, and a carrier to deliver the printed sheets from the press to said trays, substantially as described.

21. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a tray-raising rod carrying a pawl acting on the ratchet-wheel of one loose jaw to turn said jaw in one direction, a tray-lowering rod also carrying a pawl acting on the ratchet-wheel of the other loose jaw to turn said jaw in the opposite direction, means for shifting the sliding clutch-jaw, and a carrier to deliver the printed sheets from the press

to trays on said tray-holder, substantially as described.

22. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a tray-raising rod carrying a pawl acting on the ratchet-wheel of one loose jaw to turn said jaw in one direction, a tray-lowering rod also carrying a pawl acting on the ratchet-wheel of the other loose jaw to turn said jaw in the opposite direction, a movable shifting rod on the guide-frame, a connection between said rod and the sliding clutch-jaw, a contact-piece on the tray-holder to actuate said shifting rod, means for shifting the sliding clutch-jaw, and a carrier to deliver the printed sheets from the press to trays on said tray-holder, substantially as described.

23. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a tray-raising rod carrying a pawl acting on the ratchet-wheel of one loose jaw to turn said jaw in one direction, a tray-lowering rod also carrying a pawl acting on the ratchet-wheel of the other loose jaw to turn said jaw in the opposite direction, means for shifting the sliding clutch-jaw, a lock device engaging the rack-bar to hold the tray-holder stationary after it has been adjusted, and a carrier to deliver the printed sheets from the press to trays on said tray-holder, substantially as described.

24. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a tray-raising rod carrying a pawl acting on the ratchet-wheel of one loose jaw to turn said jaw in one direction, a tray-lowering rod also carrying a pawl acting on the ratchet-wheel of the other loose jaw to turn said jaw in the opposite direction, a band-brake acting on said counter-shaft, means for shifting the sliding clutch-jaw, and a carrier to deliver the printed sheets from the press to trays on said tray-holder, substantially as described.

25. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a tray-raising rod carrying a pawl acting on the ratchet-wheel of one loose jaw to turn said jaw in one direction, a tray-lowering rod also carrying a pawl acting on the ratchet-wheel of the other loose jaw to turn said jaw in the opposite direction, a band-brake acting on said counter-shaft, a counterbalance-weight connected with the tray-holder, means for shifting the sliding clutch-jaw, and a carrier to deliver the printed sheets from the press to trays on the said tray-holder, substantially as described.

26. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a tray-raising rod carrying a pawl acting on the ratchet-wheel of one loose jaw to turn said jaw in one direction, a tray-lowering rod also carrying a pawl acting on the ratchet-wheel of the other loose jaw to turn said jaw in the opposite direction, a lock device engaging the rack-bar to hold the tray-holder stationary after it has been adjusted, a band-brake acting on the counter-shaft, a counterbalance-weight connected with the tray-holder, means for shifting the sliding clutch-jaw, and a carrier to deliver the printed sheets from the press to trays on said tray-holders, substantially as described.

27. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a tray-raising rod carrying a pawl acting on the ratchet-wheel of one loose jaw to turn said jaw in one direction, a tray-lowering rod also carrying a pawl acting on the ratchet-wheel of the other loose jaw to turn said jaw in the opposite direction, a spring-actuated locking-lever having a pawl adapted to engage notches in the rack-bar, said lever adapted to be released to permit the rack to move when the shifting rods are operated to turn the counter-shaft, means for shifting the sliding clutch-jaw, and a carrier to deliver the printed sheets from the press to trays on said tray-holder, substantially as described.

28. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a pair of rods carrying pawls engaging said ratchet-wheel and connected to move in reverse directions, one adapted to partially ro-

tate the counter-shaft in one direction to raise the rack-bar and the other to partially rotate said shaft in the reverse direction to lower the rack-bar, connections on the press mechanism to operate said rods, and a carrier to deliver the printed sheets from the press to trays on said tray-holder, substantially as described.

29. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in a guide-frame and carrying a rack-bar, a counter-shaft carrying a gear meshing with said rack-bar, a clutch device on said shaft comprising two loose clutch-jaws and a feathered sliding clutch-jaw, each of said loose jaws being provided with a ratchet-wheel, a pair of rods 45 46 connected to move in reverse directions and carrying pawls acting on said ratchet-wheels to move the loose clutch-jaws and shaft in reverse directions to raise or lower the rack-bar, a cam on a shaft of the press mechanism to actuate said rods, a pivoted operating-lever, a second cam on the press-shaft to operate said lever when the tray-holder is at rest, and a carrier adapted to be reciprocated by said operating-lever to convey the printed sheets from the press to trays carried by said tray-holder, substantially as described.

30. In an anti-offsetting apparatus, the combination with a printing-press, of a tray-holder movable in guides, a counter-shaft below the tray-holder and operatively connected to move said holder up and down, clutch mechanism to reverse the direction of rotation of the shaft, a pair of rods acting on the clutch mechanism to cause the reversal of the shaft, a carrier to deliver the printed sheets from the press to trays on the tray-holder, and mechanism for actuating the rods and carrier alternately, whereby when the rods actuate the clutch device to move the tray-holder the carrier will be at rest and vice versa, substantially as described.

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

THEODORE REGENSTEINER.

Witnesses:
SAM OHNSTEIN,
MAX LAU.