March 31, 1953 G. F. ROONEY, JR 2,633,357

RACK FOR HOLDING A STACK OF PRINTED SHEETS

Filed Jan. 24, 1950 3 Sheets-Sheet 1

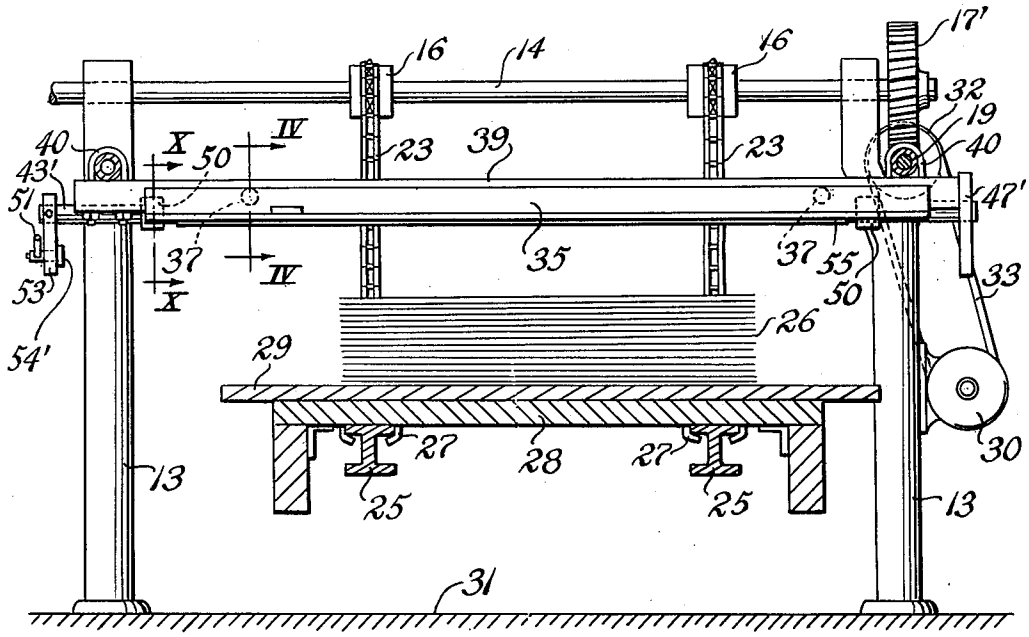



Fig. 3.

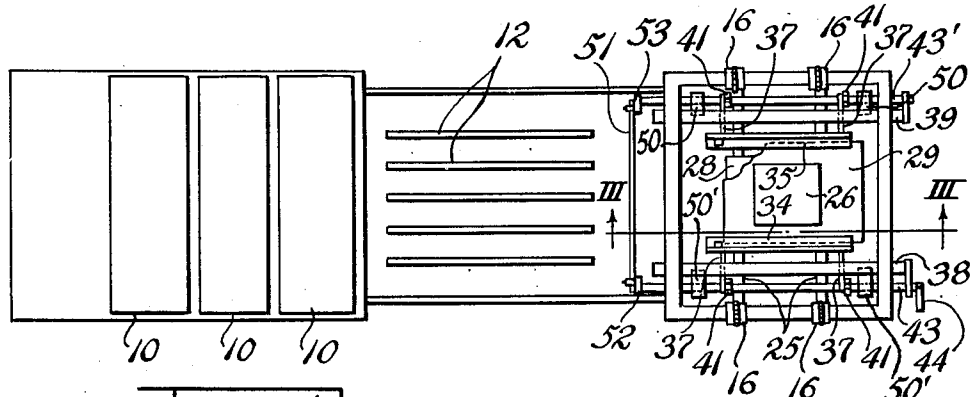



Fig. 1.

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RACK FOR HOLDING A STACK OF PRINTED SHEETS

Filed Jan. 24, 1950 3 Sheets-Sheet 2

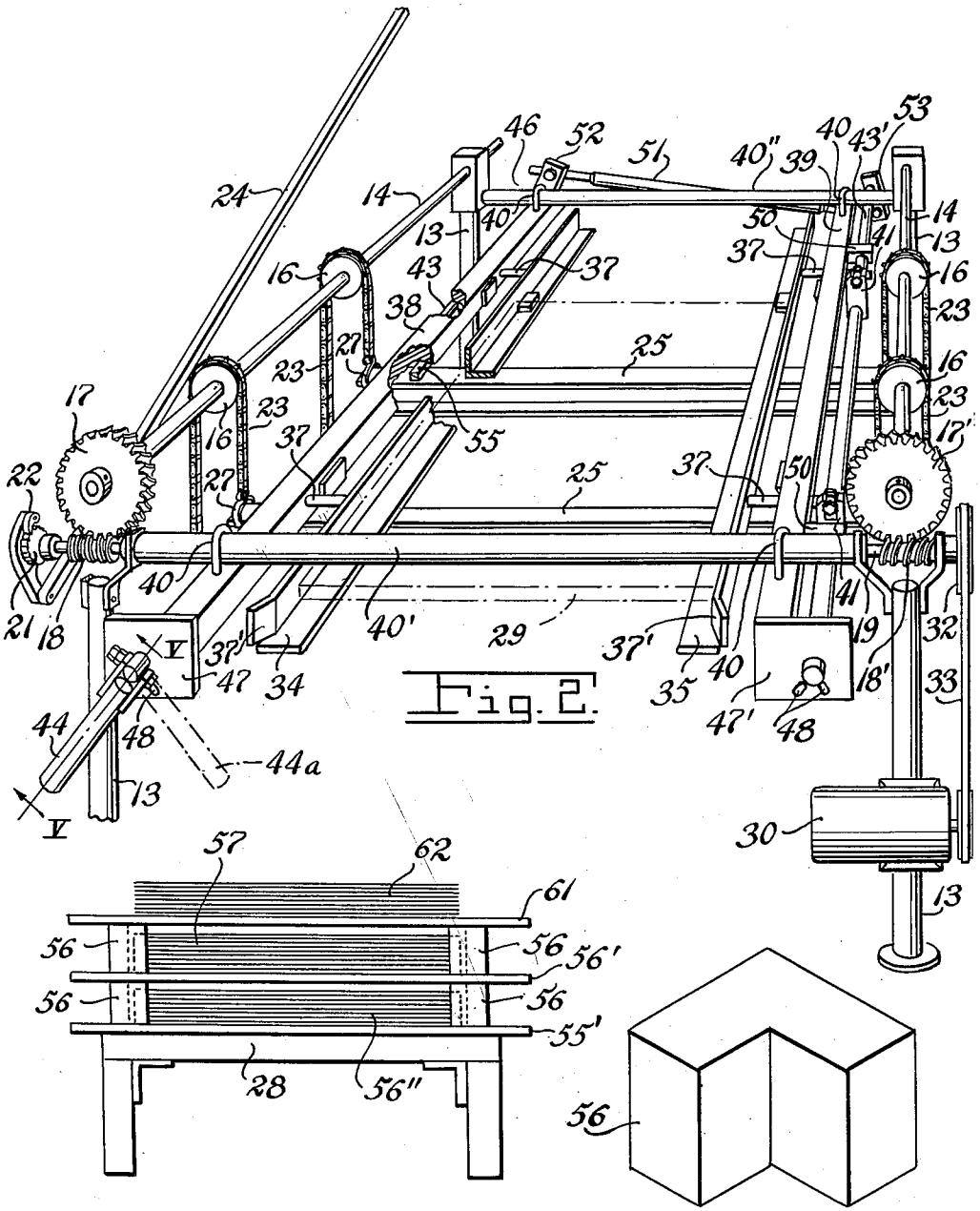



Fig. 2.




Fig. 7.




Fig. 8.

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RACK FOR HOLDING A STACK OF PRINTED SHEETS

Filed Jan. 24, 1950 3 Sheets-Sheet 3

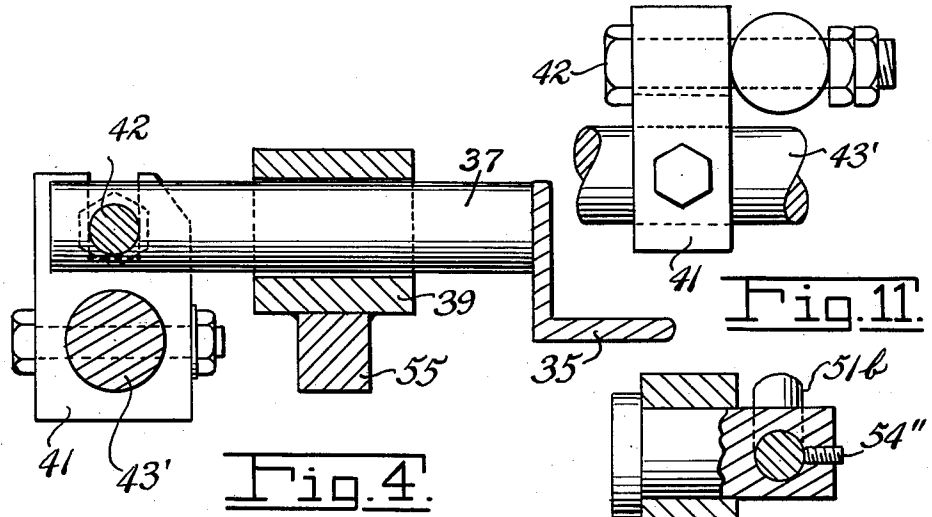



Fig. 4.




Fig. 11.

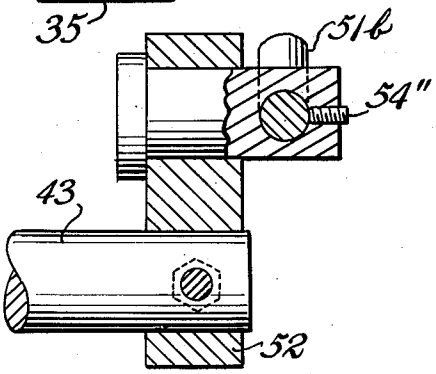



Fig. 9.

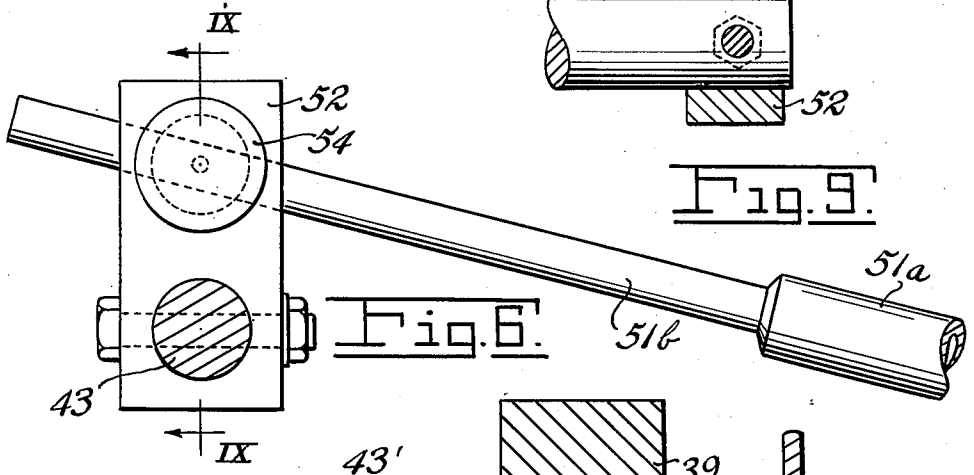



Fig. 6.

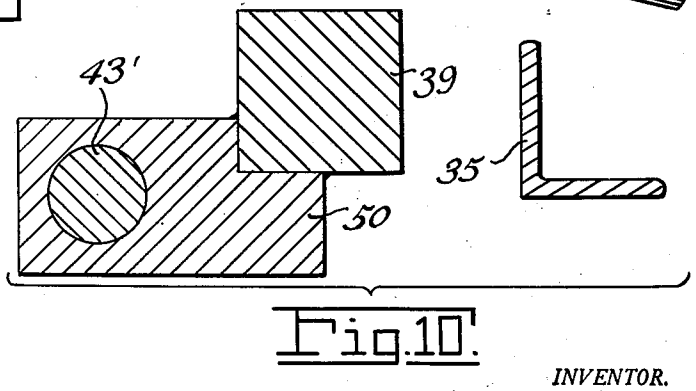



Fig. 10.

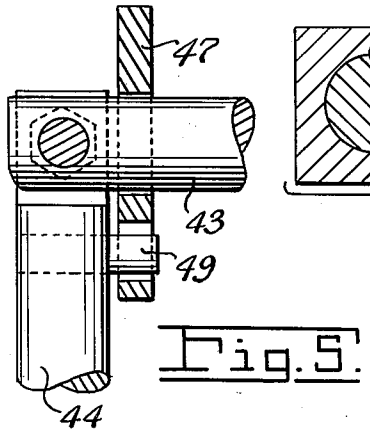



Fig. 5.

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2,633,357

# UNITED STATES PATENT OFFICE

2,633,357

## RACK FOR HOLDING A STACK OF PRINTED SHEETS

George F. Rooney, Jr., Cincinnati, Ohio

Application January 24, 1950, Serial No. 140,295

2 Claims. (Cl. 271—88)

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This invention relates to printing presses of the type which deliver printed sheets in stacked relation and more particularly relates to apparatus for supporting a stack of printed sheets as the sheets are delivered by a printing press while another stack is removed from the press.

Printed sheets may not be fully dry when delivered by a printing press and stacked. Newly printed sheets must therefore be handled carefully to prevent smearing of the ink thereon. In the past, it has been common to stop the printing press when necessary to remove a stack of printed sheets. Each press stoppage consumes valuable time and may disturb the uniformity of printing results. Accordingly, an object of this invention is to provide means for removing a stack of printed sheets from a printing press without disturbing the sheets and without need for stopping the press.

A further object of this invention is to provide a rack for supporting a stack of printed sheets while another stack is removed from a printing press.

A printing press of this type may be provided with a board or plate on which printed sheets are automatically piled by the press. A further object of this invention is to provide a rack for holding a plate on which a stack is formed while another stack is removed together with a board on which the other stack is piled.

Such a printing press may be provided with skid carrying bars which can support a skid with a stack carrying plate upon the skid. The bars are lowered gradually while a stack is forming to maintain the top of the stack at a constant level and are raised again when a stack is removed and a new stack is started. A further object of this invention is to provide a board holding rack having flanged board supporting members between which a skid carried by the bars can be raised to raise the board off the flanged members so that the flanged members can be withdrawn without disturbing printed sheets stacked on the board.

A further object of this invention is to provide a rack for supporting a stack carrying plate which rack includes flanged members for supporting the plate and means for retracting the flanged members from plate supporting position to free the plate from the flanged members.

The above and other objects and features of the invention will in part be apparent and will in part be obvious from the following detailed description, and the drawings, in which:

Figure 1 is a schematic plan view showing a printing press having a plate holding rack constructed in accordance with an embodiment of this invention;

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Figure 2 is a perspective view showing the plate holding rack and associated portions of the printing press at the delivery end of the press;

Fig. 3 is a sectional view taken along a line III—III in Fig. 1, a skid, a stack carrying plate, and a stack of printed sheets being shown in association with the rack;

Fig. 4 is an enlarged sectional view taken along a line IV—IV in Fig. 3;

Fig. 5 is an enlarged fragmentary sectional view taken along a line V—V in Fig. 2;

Fig. 6 is an enlarged fragmentary detailed view showing a portion of a linkage between opposite sides of the rack;

Fig. 7 is a view in side elevation showing a skid carrying several stacks of printed sheets;

Fig. 8 is a perspective view showing one of the stack supporting blocks used in supporting the stack holding plates shown in Fig. 7;

Fig. 9 is a view in section taken along a line IX—IX in Fig. 6;

Fig. 10 is a view in section taken along a line X—X in Fig. 3; and

Fig. 11 is a view in side elevation of the crank shown in Fig. 4.

In the following detailed description, and the drawings, like reference characters indicate like parts.

In Fig. 1, a printing press is illustrated schematically. The printing press includes appropriate printing cylinders 10. From the cylinders 10, printed sheets are advanced by moving tapes 12 which deliver printed sheets one at a time to a delivery end of the printing press which is the right-hand end, as illustrated in Fig. 1. The tapes are adapted to deliver sheets one at a time at the delivery end of the printing press. Appropriate jogging mechanism, not shown, may be provided for aligning the sheets so that the sheets fall in an even pile at the delivery end of the press.

At the delivery end of the press, posts 13 support a delivery framework. As shown in Fig. 2, the delivery framework supports a pair of worm wheel shafts 14 which extend parallel to and spaced on opposite sides of the path of delivery of printed sheets. Each of the worm wheel shafts 14 carries a pair of chain supporting sprockets 16 and further carries one of a pair of worm wheels 17 and 17'. The worm wheels 17 and 17' are in mesh with worms 18 and 18' respectively, which worms are carried by a transverse

shaft 19. A ratchet 21 mounted on the shaft 19 is slowly turned by means of a pawl 22 so that the worm wheel shafts 14 slowly turn to lower inner ends of chains 23 as printed sheets are delivered at the delivery end of the printing press. A reciprocating pawl operating shaft 24 drives the pawl. The shaft 24 may be reciprocated by appropriate driving mechanism (not shown) associated with the printing press.

The chains 23 carry transverse stack supporting bars 25 which are gradually lowered as printed sheets accumulate on a stack 26 (Fig. 3). Clamps 27 (Fig. 2) at the lower ends of the inner falls of the chains 23 are detachable from the transverse bars 25 and may be slid from the ends of the bars to release the bars when a stack of printed sheets is to be removed from the printing press.

As shown in Fig. 3, the transverse bars 25 normally carry a skid 28 on which is disposed a stack carrying plate or board 29. When a sufficient stack of printed sheets has accumulated on top of the board, the transverse worm carrying shaft 19 may be rotated rapidly by means of a motor 30 to lower the bars and skid until the skid rests on the ground 31. A pulley 32 on the shaft 19 and a belt 33 thereon forms a driving connection between the motor 30 and the shaft 19. When the skid 28 is lowered to the ground, the chain clamps 27 may be removed to release the transverse bars 25. Then the skid 28 together with the stack holding plate 29 and the stack of printed sheets may be removed from the press. When the skid and stack has been removed, a new skid may be placed upon the bars 25 and, when the chain clamps 27 have been reattached to the ends of the transverse bars 25, the pawl 22 may be released and the transverse rod 19 may be rotated in a reverse direction by the motor 30 to raise the bars and the skid for supporting a new stack.

All the apparatus described to this point is already known. In the past, it has been common to stop the printing press during removal of a stack of printed sheets. In accordance with the present invention, a rack, illustrated generally in Fig. 2, it attached to the delivery end of the printing press above the transverse bars 25. The rack includes a pair of flanged members or angles 34 and 35 which extend along the path of advancing printed sheets spaced on opposite sides thereof. The angles 34 and 35 are adapted, when in an inner position, to support a stack carrying plate, indicated in outline by dot-dash lines in Fig. 2. The angles 34 and 35 are each mounted on a pair of transverse horizontal pins. The pins 37 in turn are slidably mounted in left and right hand frame members indicated at 38 and 39 respectively. The pins 37 may be advanced toward and away from the path of printed sheets to reciprocate the angles 34 and 35 between the inner position at which the angles can engage a plate and an outer position at which the angles are free of the plate. As indicated at 37', ends of the angles are turned outwardly for guiding the plate onto the horizontal flanges thereof.

The frame members 38 and 39 are attached to the framework of the printing press at the delivery end by means of U-shaped clamping loops 40 extending over appropriate transverse frame members 40' and 40''. As shown in Fig. 2, the frame member 40' forms a bearing for the worm shaft 19.

The pins 37 are driven in and out by means of crank members 41 (see Fig. 4). Each of the



crank members 41 is provided with a yoke portion at its upper end which engages a bolt 42 which extends transversely of one of the pins. The cranks 41 are mounted on lengthwise left hand and right hand shafts indicated at 43 and 43' respectively which shafts may be rotated for driving the cranks in and out. A handle 44 is pivotally attached to the shaft 43 and may be swung between a position shown in full lines in Fig. 2 and a position indicated at 44a in dot-dash lines in Fig. 2 for advancing the angles 34 and 35 between inner and outer position.

A plate 47 attached to the end of the frame member 38 behind the handle 44 and a similar plate 47' attached to the end of the frame member 39 are provided with slots 48. A pin 49 (Fig. 5) which forms a part of the handle 44 falls automatically into one of the slots 48 when the angles are in inner or in outer position and the handle is released to lock the handle in position. When the pin 49 is in one of the slots 48, the angles 34 and 35 are locked in position. When the angles are locked in inner position, the angles cannot be inadvertently withdrawn to drop the plate 29. When the angles are in outer position, the angles cannot inadvertently be advanced inwardly into position to interfere with the plate or stack of printed sheets. As will be apparent, the handle 44 may be attached either to the left hand shaft 43 or to the right hand shaft 43' so that the rack may be operated from either side.

The shaft 43' is rotatably held in spaced relation to the frame member 39 by a pair of pillow blocks 50. As shown in Fig. 10, each pillow block is provided with a bore which forms a bearing for the shaft 43'. A corner of the pillow block is cut away and fits against and is welded to the frame member 39. As will be understood, pillow blocks 50' (Fig. 1) which space the shaft 43 from the frame member 38 are of similar construction.

Only one of the shafts 43 and 43' need be turned to advance and retract the angles. A transverse connecting rod 51 links the shafts 43 and 43' to cause the shafts to rotate in unison but in opposite directions. The connecting rod 51 includes a central tubular portion 51a and end portions 51b formed of rods welded to opposite ends of the tubular central portion. The connecting rod 51 extends between a crank 52 attached to the left hand shaft 43 and a crank 53 attached to the right hand shaft 43'. As shown in Fig. 6 a lug 54 is rotatably mounted in the crank 52 and, as shown in Fig. 3, a similar lug 54' is rotatably mounted in the crank 53. Opposite ends of the connecting rod 51 extend through transverse bores in the lugs 54 and 54'. Set screws 54'', only one of which is shown (Fig. 9), in the lugs hold the ends of the connecting rod in place in the bores to cause the shafts 43 and 43' to turn together but in opposite directions so that when one of the angles 34 or 35 is retracted or advanced, the other of the angles 34 or 35 is also retracted or advanced at the same time. As will be understood, when the set screws 54'' are released, the ends of the rod may be adjusted in the lugs.

The operation of the rack will be apparent from the foregoing detailed description and the drawings. When a stack of printed sheets has been built up upon the plate 29 (Figs. 2 and 3) the skid and board are first lowered slightly to dispose the top of the stack below the angles 34 and 35. The handle 44 is moved to the position shown in full lines in Fig. 2 and a new plate is

quickly inserted to rest upon the flanged angle members **34** and **35**. Then, the pawl **22** is released from the ratchet **21** and the transverse bars **25** are rapidly lowered to lower the skid **28** to the ground. Then, the chain clamps **27** are removed from the ends of the bars so that the skid **28**, the plate **29**, and the stack **26** of printed sheets may be removed from the printing press. Meanwhile, printed sheets are collected upon the plate which rests upon the angles **34** and **35**. When the completed stack has been removed, a new skid is placed upon the transverse bars **25** and the bars are raised to bring the skid under the plate which is carried by the angles **34** and **35**. The skid is raised to a sufficient elevation to lift the plate above the horizontal flanges of the angles **34** and **35**. A pair of stop bars **55**, one of which is attached to the bottom of each of the frame members **38** and **39** limit the distance the transverse bars can be raised. Then the handle **44** is turned from the position shown in full lines in Fig. 2 to the position shown in dot-dash lines in Fig. 2 to retract the angles on either side of but free of the plate. Then, the skid is lowered to lower the new plate below the angles **34** and **35** and the pawl is re-engaged with the ratchet so that the new plate is gradually lowered as printed sheets are piled thereon to maintain the top of the stack at substantially a constant elevation. Thus, it is never necessary to disturb a stack of printed sheets as the sheets flow from the printing press and it is unnecessary to stop the printing press while one stack is being removed from the press.

As plates wear, it may be necessary to adjust the angles toward each other. The clamp loops **40** (Fig. 2) and the set screws **54''** (Fig. 9) are loosened and the frame members, angles, and angle actuating shafts may be advanced inwardly to take up for the wear of the plates, the lugs **54** and **54'** being advanced along the end portions of the connecting rod **51**.

With some types of inks and paper stocks, only a small number of sheets can be accumulated in a stack, or offset printing occurs on the backs of the sheets. With these types of inks and stocks, it is necessary to limit the height of the stack of printed sheets. By the use of blocks of the type shown in Figs. 7 and 8, in effect, a number of stacks of printed sheets may be built upon a single skid.

In Fig. 8, a corner block **56** of L-shape is shown. Four of these corner blocks may be disposed at the four corners of a stack of printed sheets **56''** carried by a plate **55'**. Then a second plate **56'** may be placed upon the blocks. Thereupon, when a second stack of sheets **57** has been built on the plate **56'**, a second set of corner blocks may be disposed upon the plate **56'** whereupon a third plate **61** may be disposed upon the blocks and a third stack **62** may be built on the third plate **61**. Each time that it is necessary to add a new plate, the new plate is inserted upon the angles **34** and **35** in the same manner as when changing skids. Then, four corner blocks **56** are placed upon the lower plate and the skid is raised sufficiently to bring the corner blocks against the new plate to raise the new plate off the angles **34** and **35**. Thereupon, the handle **44** is turned to the



position **44a** to retract the angles **34** and **35** and the skid is lowered together with corner blocks **56**, stack carrying plates, and stacks of printed sheets to proper stacking position.

The rack shown in the drawings and described above is subject to structural modification without departing from the spirit and scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A rack for supporting and stacking printed sheets discharging from a printing press which comprises a pair of elongated spaced parallel frame members arranged to be supported on opposite sides of the sheets and parallel to the line of travel of the sheets, means for attaching said frame members to the framework of said printing press, a plurality of horizontal pins mounted for reciprocation in each frame member transversely thereof, a transverse lug mounted on each pin, an elongated flanged support member attached to the pins of each frame member, the flanges of said support members being horizontal, extending toward each other, and being adapted to support the opposite edges of a board in the path of the sheets for receiving the sheets, journal plates attached to each frame member, a shaft journaled in the plates attached to each frame member, slotted cranks carried by said shafts, each lug being received in the slot of one of said cranks, and means for turning the shafts for swinging the cranks to reciprocate the pins and support members between an inner position in which the flanges support the board and an outer position in which the flanges release the board.

2. A rack in accordance with claim 1 characterized by the fact that each shaft carries a linking crank, that a link connects said linking cranks to cause the shafts to turn together to drive the support members toward and away from each other in unison, that an operating handle is pivotally attached to one of said shafts, that said handle carries a locking pin extending transversely thereof, and that one of said journal plates has a pair of spaced apertures for receiving said locking pin to lock the shafts in positions corresponding to the supporting and released positions of said flanged support members, said handle swinging away from the apertured plate to retract the locking pin from the apertures in said plate.

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