

April 24, 1951

L. F. KRAFT

2,550,155

PRINTING PRESS DELIVERY MECHANISM

Filed Aug. 9, 1947

2 Sheets-Sheet 1

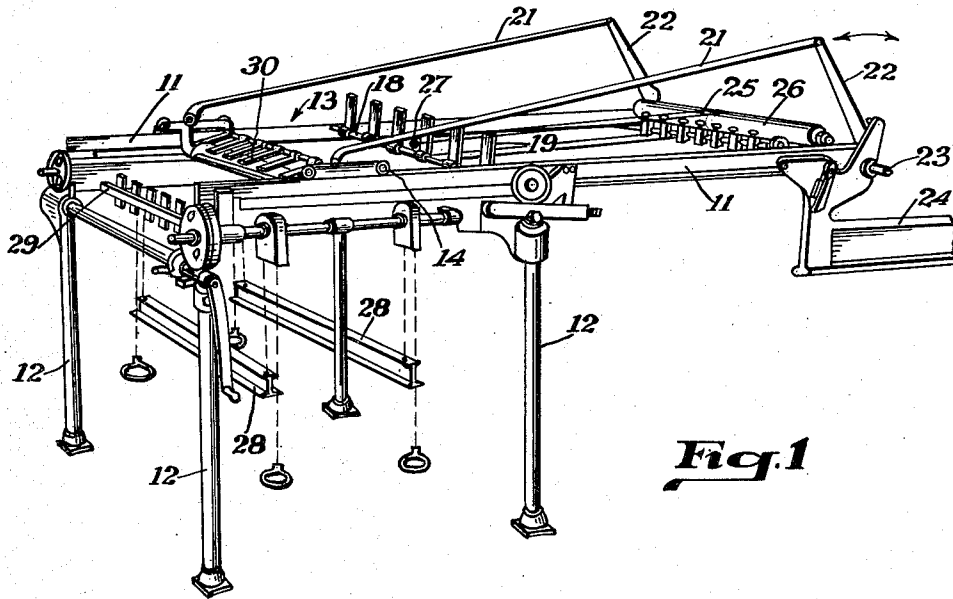


Fig. 1

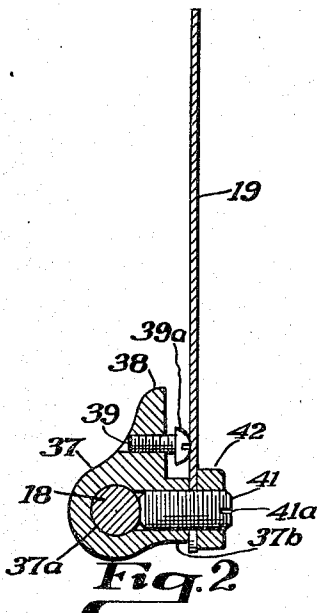


Fig. 2

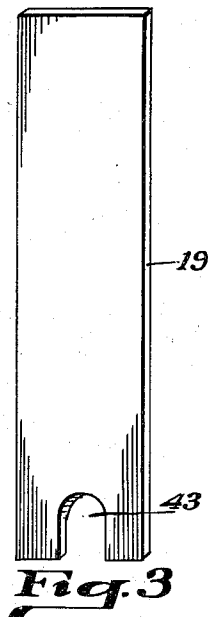


Fig. 3

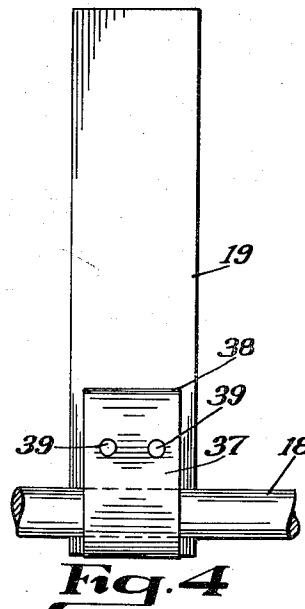


Fig. 4

INVENTOR.
LEE F. KRAFT.

BY *Richey & Watts*

ATTORNEYS.

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L. F. KRAFT

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2 Sheets-Sheet 2

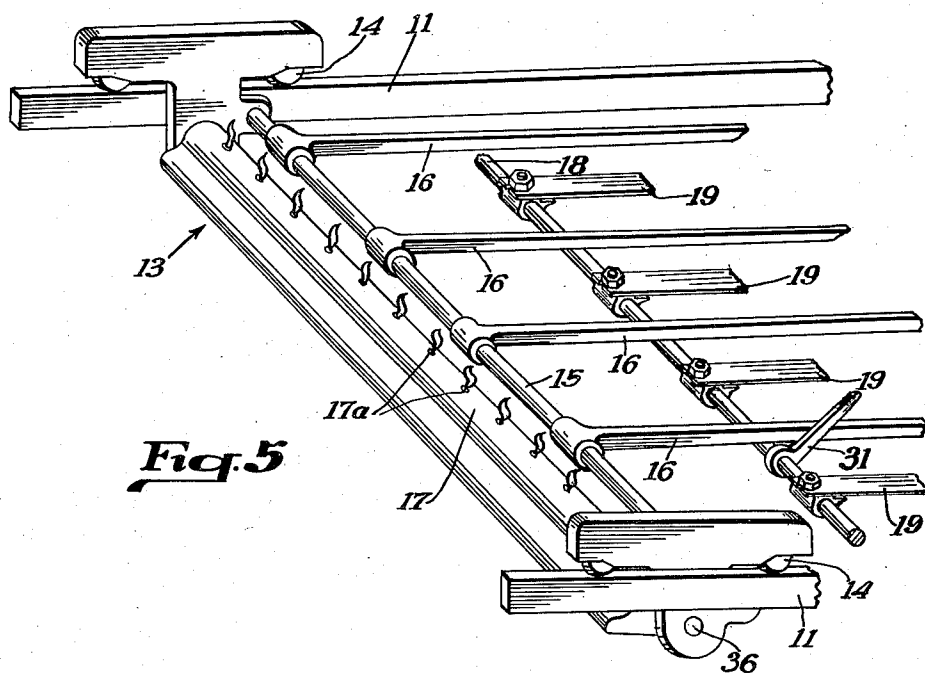


Fig. 5

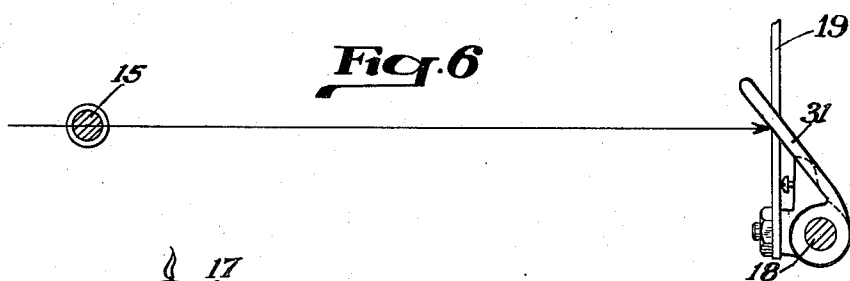


Fig. 6

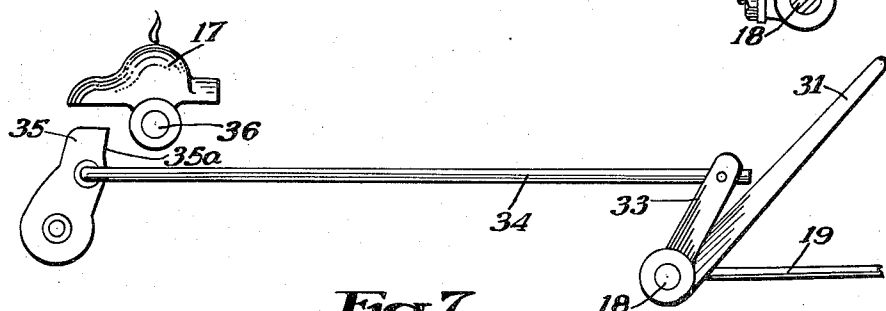


Fig. 7

INVENTOR.
LEE F. KRAFT.

BY *Richey & Watts*

ATTORNEYS.

UNITED STATES PATENT OFFICE

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PRINTING PRESS DELIVERY MECHANISM

Lee F. Kraft, Cleveland, Ohio

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5 Claims. (Cl. 271—84)

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This invention relates to printing press deliveries and has for its principal object increasing the reliability thereof and decreasing the time and frequency of shut downs.

A specific object of the invention is to provide improved, quickly attachable and detachable pusher fingers for a printing press delivery.

Another object is to provide durable fire-resistant pusher fingers.

Still another object is to prevent breakage or burning of pusher fingers in the event of faulty operation of the delivery or jamming of stock therein.

Other and further objects of the invention will become apparent as the description proceeds.

A better understanding of the invention will be afforded by the following detailed description considered in conjunction with the accompanying drawings in which

Fig. 1 is a perspective view of a printing press delivery incorporating pusher finger assemblies in accordance with my invention.

Fig. 2 is a longitudinal view of a pusher finger assembly for the apparatus of Fig. 1.

Fig. 3 is a plan view of a pusher finger such as shown in Fig. 2.

Fig. 4 is a plan view of the assembly shown in Fig. 2.

Fig. 5 is a fragmentary view of a portion of the apparatus of Fig. 1 showing the carriage, burner and sheet supporting rails and showing the pusher fingers in a depressed position.

Fig. 6 is a diagram illustrating the manner in which the pusher fingers are automatically depressed by the return movement of the carriage, and

Fig. 7 is a diagram illustrating the manner in which the pusher fingers are automatically raised by the forward movement of the carriage.

Like reference characters are utilized to designate like parts throughout the drawings.

The apparatus illustrated in Fig. 1 comprises side rails 11 secured to supporting posts 12. There is a carriage 13 movably mounted on the side rails 11 by means of rollers 14.

As shown more specifically in Fig. 5, the carriage 13 includes a cross rod 15 to which stock-supporting strips or rails 16 are secured at one end. The carriage 13 also carries a gas burner 17, having conventional orifices 17a, which supply gas to support flames or jets for overcoming static or electrical charges on paper stock being delivered. Suitable gas connections are provided, such as a flexible hose (not shown).

Supported between the rails 11 is a shaft 18 for carrying pusher fingers 19. The shaft 18 is positioned near the end of the travel of the burner 17 and the carriage 13 so that the pusher fingers 19 may be erected to prevent stock from being carried back toward the printing press when the carriage 13 is retracted.

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Suitable mechanism is provided for causing the forward and backward movement of the carriage 13, such as connecting rods 21 linking the carriage 13 to oscillating crank arms 22. For oscillating the arms 22 there is a crankshaft 23, to which the arms 22 are secured. Suitable means (not shown) are provided for rotating the crankshaft 23 to and fro through a sufficient angle to produce the desired movement of carriage 13. Suitable adjustments, which need not be described herein, are provided for varying the stroke or length of travel of the carriage 13 according to the size of the sheets to be delivered. In the arrangement shown, the oscillating shaft 23 is carried by part 24 of the printing press frame.

For conveying sheets of paper or other stock upon which impressions have been printed or which have been scored, or upon which some other operation has been performed, traveling tapes or belts 25 are provided. To avoid confusion in the drawing, only one of such tapes 25 has been shown. It will be understood, however, that a plurality of such tapes are provided side by side, each arranged to travel from the printing press in a direction toward the front of the delivery, which is at the left side of the delivery in Fig. 1. For driving the tapes 25, they are carried around a roller 26 at one end and around separate pulleys 27 at the other end.

To form a platform of adjustable height for receiving the sheets which are stacked by the delivery, a pair of rails 28 are provided which may be adjustably supported by adjusting chains or the like. Suitable end stops such as side joggers 29 are provided to prevent the sheets conveyed by the carriage 13 from traveling beyond the position at which they are to be stacked. Likewise, suitable hold-down fingers 30 are provided to prevent the sheets from flying off the supporting rails 16.

As shown in more detail in Figs. 6 and 7, mechanism is provided for lowering and raising the pusher fingers 19. This mechanism is arranged for enabling a sheet to be carried by the tapes 25 to the carriage 13 and moved forward by the carriage 13 while preventing additional sheets from passing onto the carriage 13 until it has retracted. The arrangement is such also as to cause each sheet to fall upon the platform rails 28 and not be permitted to be carried backward when the carriage 13 is retracted.

For depressing pusher fingers 19, or moving them to the horizontal position shown in Fig. 5, a finger depressing lever 31 is mounted upon the pusher-finger shaft 18. The lever 31 is so positioned that the underside is struck by the cross rod 15 when the carriage 13 executes its backward stroke and thereby the shaft 18 is rotated to the position where the pusher fingers are horizontal, as in Fig. 5. The cross rod 15 does not strike the lever 31 and the pusher fingers 19 are

not depressed to the horizontal position until the carriage 13 has nearly reached the end of its backward stroke.

For lifting the pusher fingers 19 again when the carriage reaches the end of its forward stroke, a finger raising lever or crank 33 is provided which is also secured to the pusher-finger shaft 18, and there is a pull-rod 34 and a pull-rod lever 35 connected to the finger raising lever 33 by the pull-rod 34. These are shown in Fig. 7, but not visible in Figs. 1 and 5. A projection 36 is provided at the end of the burner 17 which is adapted to engage the edge 35a of the pull-rod lever 35 upon the forward stroke of the carriage 13 so as to draw the lever 33 to the left from the position shown in Fig. 3 and thereby raise the pusher fingers 19 to the vertical position shown in Figs. 6 and 1.

In case one or more sheets of stock should be warped or bent, or for some other reason the stock should jam between the delivery carriage 13 and the depressed fingers 19, undue force may be applied to some of the fingers or the motion of the carriage 13 may be arrested so that the flames issuing from the ports 17a play upon the fingers 19 for an excessive length of time. It is desirable, therefore, to provide fingers which are resistant to breakage and are fire-resistant, and in addition which may be readily detached and attached so as to provide for quick and easy replaceability of fingers. To provide for easy replaceability, the fingers 19 are mounted in assemblies, each including a socket 37 to which each finger is secured. As shown in Figs. 2 and 4, each socket 37 has a bore 37a receiving the pusher-finger shaft 18 and a lip 38 in which screws 39 may be secured. Preferably, however, the screws 39 are not arranged for rigidly securing the pusher-fingers 19. Instead the screws 39 are so set that the heads 39a act as backing for the fingers 19. Each pusher-finger socket 37 is provided with a set screw 41 for securing it to the pusher-finger shaft 18. Preferably headless set screws 41 are provided, each having a screw eye 41a adapted to receive a screw driver, and the set screws 41 are sufficiently long to receive nuts 42 for securing the pusher-fingers 19 to bosses 37b formed in the pusher-finger sockets 37 and locking the set screws.

The pusher-fingers 19 are each provided with a single elongated slot 43 fitting the set screw 41, so that any damaged pusher-finger 19 may readily be detached by loosening the nut 42 or a replacement may be attached by tightening the nut 42. Since the pusher-fingers are arranged for ready replaceability, as described, they may be composed of relatively brittle material such as red fiber board which is not resistant to prolonged exposure to the gas flame. Preferably, however, the pusher-fingers 19 are composed of a bendable, non-breaking and fire-resisting material such as aluminum alloy, for example. Such fingers are not damaged by exposure to flames, and in the event of serious jamming of the stock at the pusher-finger shaft 18, they will not be broken but merely bent so that they can be straightened and put back in service.

While I have described my invention as embodied in concrete form and as operating in a specific manner in accordance with the provisions of the patent statutes, it should be understood that I do not limit my invention thereto, since various modifications thereof will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope

of which is set forth in the annexed claims. I claim:

1. In a printing press delivery, including a movable carriage, rails therefor, and a pusher-finger shaft extending between said rails, over which said carriage is adapted to travel in its backward stroke, the combination comprising pusher finger sockets on said shaft, each having a headless set screw for securement to said shaft, pusher fingers for each such socket, each having a slot in the end thereof engaging said set screw, a nut detachably securing said pusher finger to said socket, a crank on said pusher-finger shaft, a lever near the forward end of said delivery, and a pull rod joining said lever to said crank for rotating said shaft to lift said pusher fingers when said carriage strikes said lever at the forward end of its stroke.

2. A pusher finger assembly for a printing press delivery comprising in combination with a rock shaft a pusher finger socket having a set screw therein securing said socket to said rock shaft, a nut threaded upon said set screw, and a pusher finger slotted at the end with the slot engaging the set screw and the nut clamping the slotted end portion of said finger to said socket, for quick detachment and replacement in case of breakage.

3. A pusher finger assembly for a printing press delivery comprising in combination with a rock shaft a pusher finger socket having a set screw therein securing said socket to said rock shaft, a nut threaded upon said set screw, and a pusher finger slotted at the end with the slot engaging the set screw and the nut clamping the slotted end portion of said finger to said socket, said pusher finger being composed of aluminum alloy.

4. A pusher finger assembly for a printing press delivery comprising in combination with a rock shaft a pusher finger socket having a set screw therein securing said socket to said rock shaft, a nut threaded upon said set screw, and a pusher finger slotted at the end with the slot engaging the set screw and the nut clamping the slotted end portion of said finger to said socket, said pusher finger being composed of a bendable non-breaking metal.

5. A pusher finger assembly for a printing press delivery comprising in combination with a rock shaft a pusher finger socket having a set screw therein securing said socket to said rock shaft, a nut threaded upon said set screw, and a pusher finger slotted at the end with the slot engaging the set screw and the nut clamping the slotted end portion of said finger to said socket, said pusher finger being composed of red fiber board.

LEE F. KRAFT.

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