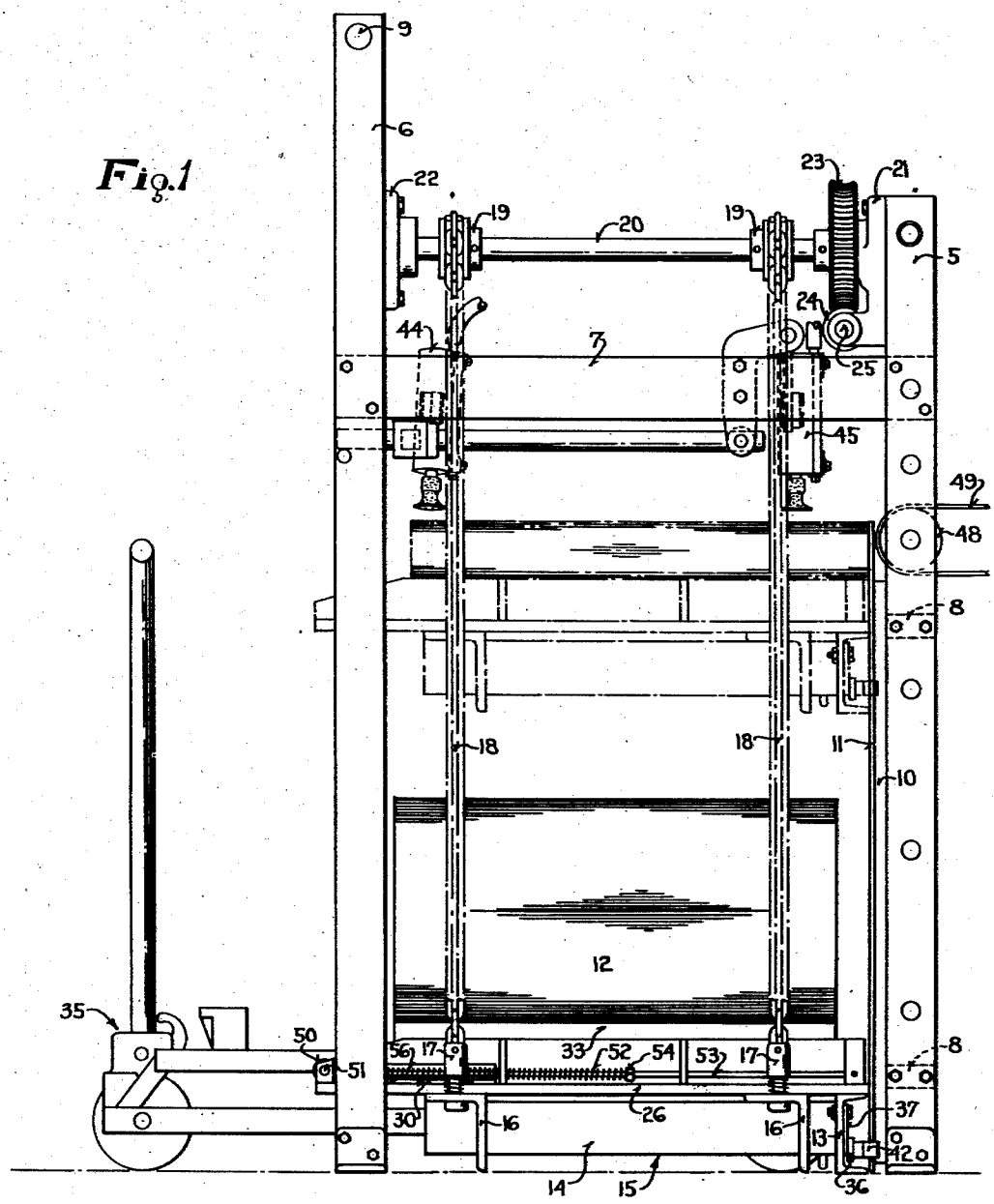
Oct. 15, 1940. G. A. MARTIN 2,218,401

SHEET FEEDER

Filed Aug. 22, 1938 3 Sheets-Sheet 1

Fig. 1



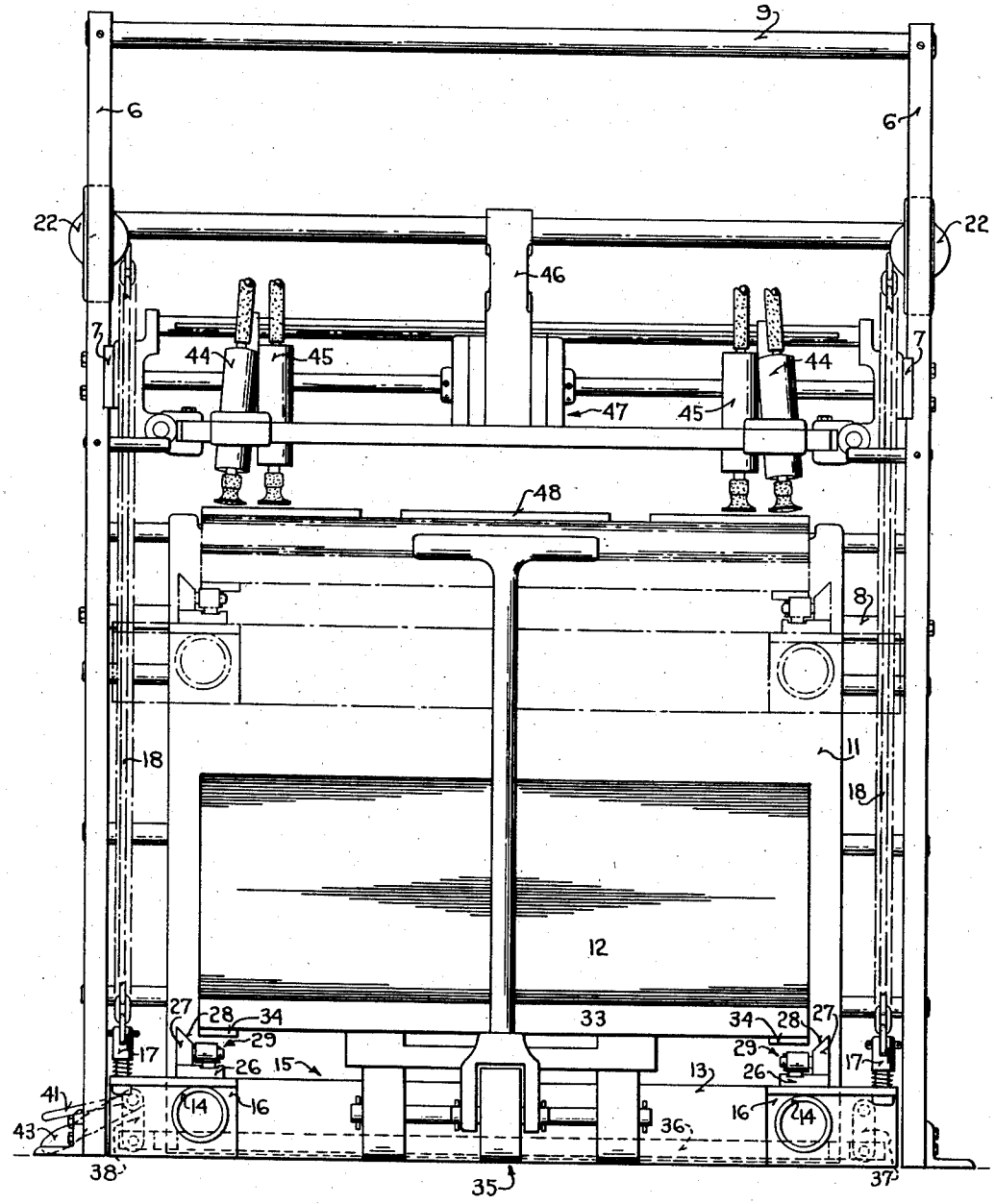
INVENTOR
GEORGE A. MARTIN
BY
J. A. Hobson Jr.
ATTORNEY

Oct. 15, 1940. G. A. MARTIN 2,218,401

SHEET FEEDER

Filed Aug. 22, 1938 3 Sheets-Sheet 2

Fig. 2



INVENTOR

GEORGE A. MARTIN

BY

J. A. Hobson Jr.

ATTORNEY

Oct. 15, 1940. G. A. MARTIN 2,218,401

SHEET FEEDER

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Fig. 4

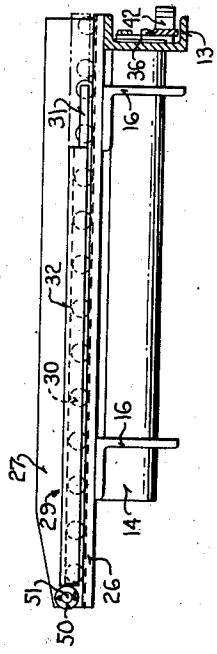


Fig. 5

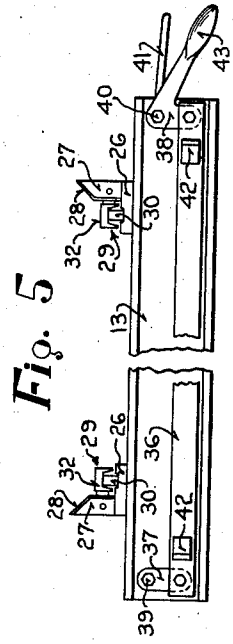


Fig. 6

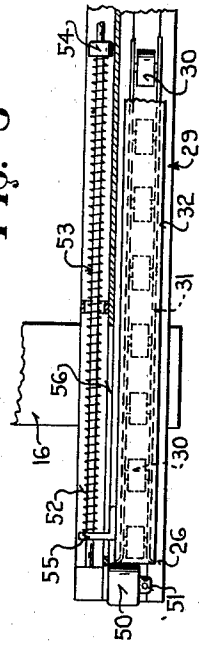
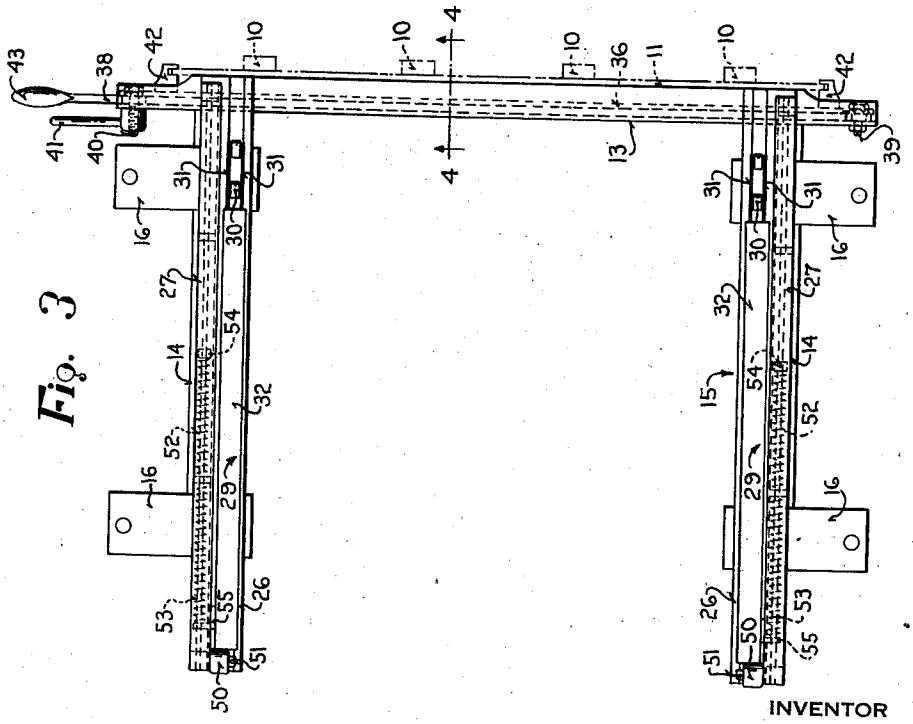


Fig. 3



INVENTOR
GEORGE A. MARTIN
BY
J. A. Hobson Jr.
ATTORNEY

Patented Oct. 15, 1940

2,218,401

UNITED STATES PATENT OFFICE

2,218,401

SHEET FEEDER

George A. Martin, Pearl River, N. Y., assignor to Dexter Folder Company, Pearl River, N. Y., a corporation of New York

Application August 22, 1938, Serial No. 226,050

16 Claims. (Cl. 271—62)

This invention relates to sheet feeders and while capable of general use is more particularly adapted for embodiment in feeders for feeding sheets of tin, black iron, aluminum, and the like, to printing presses, punch presses, coating and varnishing machines, and various other instrumentalities employed in the processing or making of metal articles or containers.

One object of the present invention is to provide a sheet feeder of the "double-end" chain elevator type having a pile support so constructed that a pile of sheets may be run directly into the feeder and directly loaded therein on said elevator.

Another object of the present invention is to provide a sheet feeder of the "double-end" chain elevator type which can be loaded or reloaded directly therein with a pile of sheets and the elevator of which with the pile can be bodily shifted as a unit to properly position said pile in the feeder.

Another object of the present invention is to provide a sheet feeder having an improved pile elevator so constructed and arranged that a pile of sheets thereon may be bodily shifted easily and conveniently to proper position in the feeder.

These and other objects of the present invention will appear as the following description thereof proceeds and in order to more clearly understand said invention reference may be had to the accompanying drawings which illustrate one embodiment thereof.

In said drawings:

Fig. 1 is a side elevation of a sheet feeder embodying the present invention and particularly adapted for feeding metal sheets;

Fig. 2 is a rear elevation of the feeder shown in Fig. 1;

Fig. 3 is a top plan view of a pile support forming part of a pile elevator shown in Figs. 1 and 2;

Fig. 4 is a vertical longitudinal sectional view of the pile support on the line 4—4 of Fig. 3;

Fig. 5 is a front elevation of the pile support showing a device for bodily shifting the same; and

Fig. 6 is an enlarged fragmentary top plan view, partly in section, of the pile support, showing a rolling carriage for bodily shifting a pile of sheets thereon.

Referring to the drawings, wherein like reference characters designate like parts throughout the several views, the various movable parts of the feeder as well as certain stationary parts thereof are mounted on a frame comprised by front uprights 5 and rear uprights 6 connected together by side members 7 (Figs. 1 and 2). The uprights 5 and 6 are bolted or otherwise suitably secured to the machine foundation, the front uprights 5 being connected together by cross beams 8 bolted or otherwise suitably secured thereto, and the rear uprights 6 being connected together at the tops thereof by a stay shaft 9. Bolted or otherwise suitably secured to the cross beams 8 and spaced therefrom, as by spacer bars 10 (Figs. 1 and 3), is a metal apron or pile plate 11 against which the front side of a supply or pile of metal or other sheets 12 bears during elevation of the same.

In accordance with the present invention the feeder is provided with a "double-end" chain type pile elevator which can be directly loaded or reloaded in the feeder with a pile of metal or other sheets, as from a truck or other device that may be run into the feeder through the rear thereof; with novel means whereby the pile of sheets may be shifted on the elevator to proper position in the feeder; and with improved means for bodily shifting the pile elevator and the pile of sheets laterally as a unit to properly position said pile in the feeder. As herein shown said pile elevator and means are preferably constructed as follows.

Extending transversely of the feeder adjacent the metal apron or pile plate 11 is a channel member 13 which has welded or otherwise suitably secured thereto a pair of spaced horizontal tubular arms 14 which, together with the member 13 form a U-shaped frame or support that is indicated broadly at 15 (Figs. 1 to 4 inclusive) and is open at the rear thereof. Engaged over and welded or otherwise suitably secured to the tubular arms 14 are spaced angle plates 16 which, as clearly shown in Figs. 2 and 3, project laterally from said arms. Connected with the angle plates 16, as by couplings 17, are corresponding extremities of "double-end" chains 18 (Figs. 1 and 2) the links of which engage in the teeth of sheaves 19 that are fixed on, and rotated by, shafts 20 at opposite sides of the feeder frame. These shafts 20 are journalled in suitable bearings in brackets 21 and 22 which are bolted or otherwise suitably secured to the uprights 5 and 6, respectively. The pile of sheets 12 is loaded on the support 15 as hereinafter described, and shafts 20 are driven intermittently to keep the top of the pile at the proper feeding level. Shafts 20 may also be driven continuously to rapidly raise and lower the U-shaped frame or support 15 for loading or reloading purposes. In either case the drive for shafts 20 is obtained

from a suitable source of power by gearing connected therewith and including worm wheels 23 fixed on said shafts and meshing with worm gears 24 fixed on a shaft 25. Shaft 25 extends transversely of the feeder frame and is journalled in suitable bearings in the brackets 21.

Welded or otherwise suitably secured to the channel member 13 and angle plates 16 at the tops thereof are horizontal rails 26 provided with guide members 27 having beveled edges 28. Resting on, and movable along, the horizontal rails 26 are rolling carriages indicated broadly at 29 (Figs. 3 to 6 inclusive) by which the pile of sheets 12 may be freely moved on the U-shaped frame or support 15 into proper position against the metal apron or pile plate 11. These carriages 29 are comprised by a plurality of spaced rollers 30 journalled between side bars 31, and small channel members 32 resting on the rollers 30 and movable relative thereto. It will thus appear that when the carriages 29 are moved along the rails 26 the small channel members 32 will have a movement twice that of the rollers 30 due to the rolling action of said rollers plus the longitudinal movement thereof. In this manner the pile of sheets 12 can be quickly and freely moved on the U-shaped frame or support 15 against the metal apron or pile plate 11.

When it is desired to initially load the feeder, the U-shaped frame or support 15 is lowered to the machine foundation or to a predetermined position depending on the height of the truck or other device used for loading the elevator. A pile board 33 having runners 34 secured in any suitable manner on opposite sides thereof is then placed on a truck such as indicated broadly at 35 and loaded with a pile of metal or other sheets 12. At this time the truck 35, pile board 33 and pile of sheets 12 thereon are backed into the feeder between the tubular arms 14 as shown in Figs. 1 and 2 so that the opposite sides of the pile board 33 will be disposed slightly above the rolling carriages 29 which are in the position shown in full lines in Figs. 3, 4 and 6.

When the truck 35, pile board 33 and pile of sheets 12 are run into the feeder as aforesaid, the elevator which has been previously stopped for loading of the sheets thereon is again started so that the chains 18 are rapidly raised and the U-shaped frame or support 15 is moved upwardly. The carriages 29 on the U-shaped frame or support 15 engage the bottom of the pile board 33 and through continued rapid elevation of said frame or support the pile board 33 and pile of sheets 12 thereon are lifted from the truck 35 and elevated until the top of said pile is at proper height for feeding of the sheets therefrom one after another as hereinafter described. During rapid elevation of the U-shaped frame or support 15, the pile board 33 and pile of sheets 12 thereon are quickly and freely moved forward on the carriages 29 by the machine attendant until the front side of said pile engages the metal apron or pile plate 11 and is properly squared thereagainst.

In the event the elevated pile of sheets 12 is not properly positioned laterally of the feeder, due to improper loading of the same on the pile board 33, the U-shaped frame or support 15 together with the pile board 33 and pile of sheets 12 may be bodily shifted sidewise to properly position the pile with respect to the machine with which the feeder is associated. This sidewise adjustment of the U-shaped frame or support 15 may be accomplished during the operation of the feeder and is preferably effected as follows.

Extending along the channel member 13 between the latter and the metal apron or pile plate 11 is a bar 36 (Figs. 3 and 5) which is pivotally connected at opposite ends thereof to a pair of parallel links 37 and 38, respectively. The link 37 is pivoted on a stud 39 secured in any suitable manner on the channel member 13, while the link 38 is pivoted on a stud 40 which is loosely mounted in said channel member. Stud 40 is provided on the extended threaded end thereof with a clamping handle 41 for clamping the link 38 against the channel member 13 and locking the U-shaped frame or support 15 in its adjusted position. Bolted or otherwise suitably secured to the bar 36 is a pair of spaced blocks 42 which engage opposite sides of the metal apron or pile plate 11. Secured to or formed integrally with the link 38 is a handle 43 by which sidewise adjustment of the U-shaped frame or support 15 is accomplished. It will thus appear that when the handle 43 is moved in opposite directions and through engagement of the blocks 42 with opposite sides of the metal apron or pile plate 11, the U-shaped frame or support 15 will be shifted bodily sidewise in opposite directions to properly align the pile of sheets with respect to the machine with which the feeder is associated. The support 15 is then locked in its adjusted position by the clamping handle 41.

The sheets of pile 12 are separated and forwarded one after another from the top thereof by suction sheet separating devices and suction sheet forwarding devices indicated broadly at 44 and 45, respectively (Figs. 1 and 2) which are suitably connected with the housing 46 of a valve mechanism 47. The mounting, construction and operation of the sheet separating devices 44, the sheet forwarding devices 45 and the valve mechanism 47 is the same as the mounting, construction and operation of the sheet separating devices, the sheet forwarding devices and the valve mechanism disclosed in the application Serial No. 116,692 of Leonard Baker, George A. Martin and Leo C. Williams, filed December 19, 1936, and needs no detail description herein. The separated and forwarded sheets are delivered to conveying means including a transversely extending feed roller 48 journalled in suitable bearings in the front uprights 5, and a plurality of tapes 49 passing around said feed roller.

When the sheets of the initial pile 12 are completely exhausted and it is desired to reload the feeder, the U-shaped frame or support 15 is again rapidly lowered to the machine foundation or to a predetermined position and stopped. The empty pile board 33 is removed from the U-shaped frame or support 15 and a new pile of sheets which had been placed on an auxiliary pile board and loaded on the truck 35 during the feeding of the sheets from the initial pile is then backed into the feeder and the hereinbefore described operations with respect to the initial loading of the feeder are repeated. To facilitate removal of the empty pile board 33 from the U-shaped frame or support 15, a pair of rollers 50 (Figs. 3, 4 and 6) are preferably provided which are journalled on pins 51 secured in any suitable manner on the guide members 27 at the rear ends thereof. The empty pile board thus rests on rollers 50 during removal of the board from the feeder.

At the time the empty pile board 33 is removed from the U-shaped frame or support 15, the roll-

ing carriages 29 are automatically moved rearwardly to their full line positions by push springs 52 (Figs. 1, 3 and 6) extending along rods 53 which are secured in any suitable manner at opposite ends thereof on the guide members 27. The springs 52 on rods 53 are disposed between collars 54 secured on said rods and plates 55 that are welded or otherwise suitably secured to the small channel members 32 and through which the rods 53 extend. The plates 55 project through elongated openings 56 (Figs. 1 and 6) formed in the guide members 27. It will thus appear that when the rolling carriages 29 are moved forwardly against the tension of the springs 52 to position the front side of the pile of sheets against the metal apron or plate 11, said carriages are held in their forward positions by the weight of the pile board 33 or with the additional weight of the sheets thereon. Upon removal of the empty pile board 33 the carriages 29 will be moved rearwardly against the rollers 50 by the expanding action of the springs 52 in readiness to receive a new load of sheets.

It will be noted that a pile elevator constructed in accordance with the present invention can be loaded or reloaded quickly and conveniently thereby increasing the amount of time of operation of the feeder and resulting in a greater output of sheets therefrom.

The present description and accompanying drawings set forth with more or less particularity a preferred embodiment of the invention, but it is to be expressly understood that said invention is not limited to said embodiment or otherwise than by the terms of the appended claims.

What I claim is:

1. In a sheet feeder, a pile elevator including a support for a pile of sheets, and rolling carriages mounted on the support and extending longitudinally therealong at opposite sides thereof for properly positioning the pile of sheets in said feeder.

2. In a sheet feeder, a pile elevator including a support comprised by a pair of spaced arms connected together at their forward ends and forming a U-shaped frame open at the rear for receiving and supporting a pile of sheets, and rolling carriages mounted on the arms of said support and movable therealong for properly positioning a pile of sheets in said feeder.

3. In a sheet feeder, a pile elevator including a support for a pile of sheets, and rolling carriages comprised by relatively movable members mounted on the support and movable therealong for properly positioning the pile of sheets in said feeder.

4. In a sheet feeder, a pile elevator including a support for a pile of sheets, rolling carriages mounted on the support at opposite sides thereof and movable therealong in one direction for properly positioning the pile of sheets in said feeder, and means on the support for moving the rolling carriages in the opposite direction.

5. In a sheet feeder, a pile elevator including a support comprised by a pair of spaced arms connected together at their forward ends and forming a U-shaped frame open at the rear thereof for lifting a pile board and pile of sheets thereon from a loading truck or other device disposed between said arms, rolling carriages mounted on the arms of said support and movable therealong in one direction for properly positioning the pile of sheets in said feeder and movable in the opposite direction into position for receiving the pile board and pile of sheets thereon, and means on the support for moving the rolling carriages in said opposite direction.

6. In a sheet feeder, a pile elevator including a support for a pile of sheets, and rolling carriages mounted on the support for properly positioning the pile of sheets in said feeder, said rolling carriages consisting of lower members provided with a plurality of spaced rollers resting on and rolling along the support and upper members resting on said rollers and having a movement twice that of the lower members.

7. In a sheet feeder, a pile elevator including a support comprised by a pair of spaced arms connected together at their forward ends and forming a U-shaped frame open at the rear thereof for lifting a pile board and pile of sheets thereon from a loading truck or other device disposed between said arms, rolling carriages mounted on the arms of said support and movable therealong in one direction to receive the pile board and pile of sheets thereon and movable in the opposite direction to properly position the pile of sheets in said feeder, said rolling carriages consisting of lower members provided with a plurality of spaced rollers resting on and movable along said arms and upper members resting on the rollers and movable relative to said lower members, and spring means on the arms and acting on said upper members for moving the rolling carriages to pile board and pile receiving position.

8. In a sheet feeder, a pile elevator including a U-shaped frame or support open at the rear thereof and comprised by a pair of spaced arms connected together at their forward ends for lifting a pile board and pile of sheets thereon from a loading truck or other device disposed between said arms, a front pile plate, rolling carriages mounted on the arms of said support and movable therealong in one direction to receive the pile board and pile of sheets thereon and movable in the opposite direction to properly position the pile of sheets against said front pile plate, spring means on the arms for moving the rolling carriages to pile board and pile receiving position, means on the support and cooperating with the front pile plate for bodily shifting said support sidewise to properly position the pile of sheets thereon transversely of the feeder, and means for locking said support shifting means when the support is shifted as aforesaid.

9. In a sheet feeder having four laterally and longitudinally spaced vertically extending flexible pile elevating elements, a pile support comprising a pair of side members and a cross member rigidly connected with forward end portions of said side members and forming therewith a frame open at the rear thereof, and means for freely and solely suspending the frame by the four flexible pile elevating elements and comprising a plurality of attaching means connected with said flexible pile elevating elements and extending from the side members of said frame at front and rear portions thereof respectively.

10. In a sheet feeder having four laterally and longitudinally spaced vertically extending flexible pile elevating elements, a pile support comprising a pair of side members and a cross member rigidly connected with forward end portions of said side members and forming therewith a frame open at the rear thereof, and means for freely and solely suspending the frame by the four flexible pile elevating elements and comprising a plurality of attaching means connected

with said flexible pile elevating elements, said attaching means extending laterally from and being secured to the side members of said frame.

11. In a sheet feeder having four laterally and longitudinally spaced vertically extending flexible pile elevating elements, a pile support comprising a pair of side members and a cross member rigidly connected with forward end portions of said side members and forming therewith a frame open at the rear thereof, and means for freely and solely suspending the frame by the four flexible pile elevating elements and comprising a plurality of attaching means connected with said flexible pile elevating elements, said attaching means being secured to the side members of said frame and extending laterally from and outwardly of said side members.

12. In a sheet feeder having four laterally and longitudinally spaced vertically extending flexible pile elevating elements, a pile support comprising a pair of tubular side members and a cross member of greater height than width disposed edgewise and secured to forward end portions of the tubular side members to form therewith a frame open at the rear thereof, and means for freely and solely suspending the frame by the four flexible pile elevating elements and comprising a plurality of attaching means connected with said flexible pile elevating elements and extending from the side members of said frame.

13. In a sheet feeder having a pile elevator comprising a support for a pile of sheets and flexible elevating means secured to said support, means for shifting the support and the flexible elevating means laterally to properly position the pile of sheets and comprising stationary means independent of the pile support and shifting means movably mounted on said pile support and cooperating with said stationary means.

14. In a sheet feeder having a pile elevator comprising a support for a pile of sheets and flexible elevating means secured to said support, means for shifting the support and the flexible elevating means laterally to properly position the pile of sheets and comprising stationary means independent of the pile support and movable means cooperating with said stationary means and comprising manually operated means mounted on said pile support.

15. In a sheet feeder having a pile elevator comprising a support for a pile of sheets and flexible elevating means secured to said support, means for shifting the support and flexible elevating means laterally to properly position the pile of sheets and comprising stationary means independent of the pile support and a shifting element cooperating with said stationary means and movably mounted on said pile support, and manually operated means carried on the pile support with said shifting element and operatively connected therewith to operate the same.

16. In a sheet feeder having a pile elevator including flexible elevatiing means, a support secured thereto for holding a pile of sheets and including a front cross member, and stationary front pile guiding means, mechanism for shifting the support and the flexible elevating means laterally to properly position the pile of sheets and comprising shifting means movably mounted on the front cross member of the pile support and engaging said stationary front pile guiding means, and a handle carried on said front cross member with the movably mounted shifting means and operatively connected therewith to operate the same.

GEORGE A. MARTIN.