

Nov. 5, 1929.

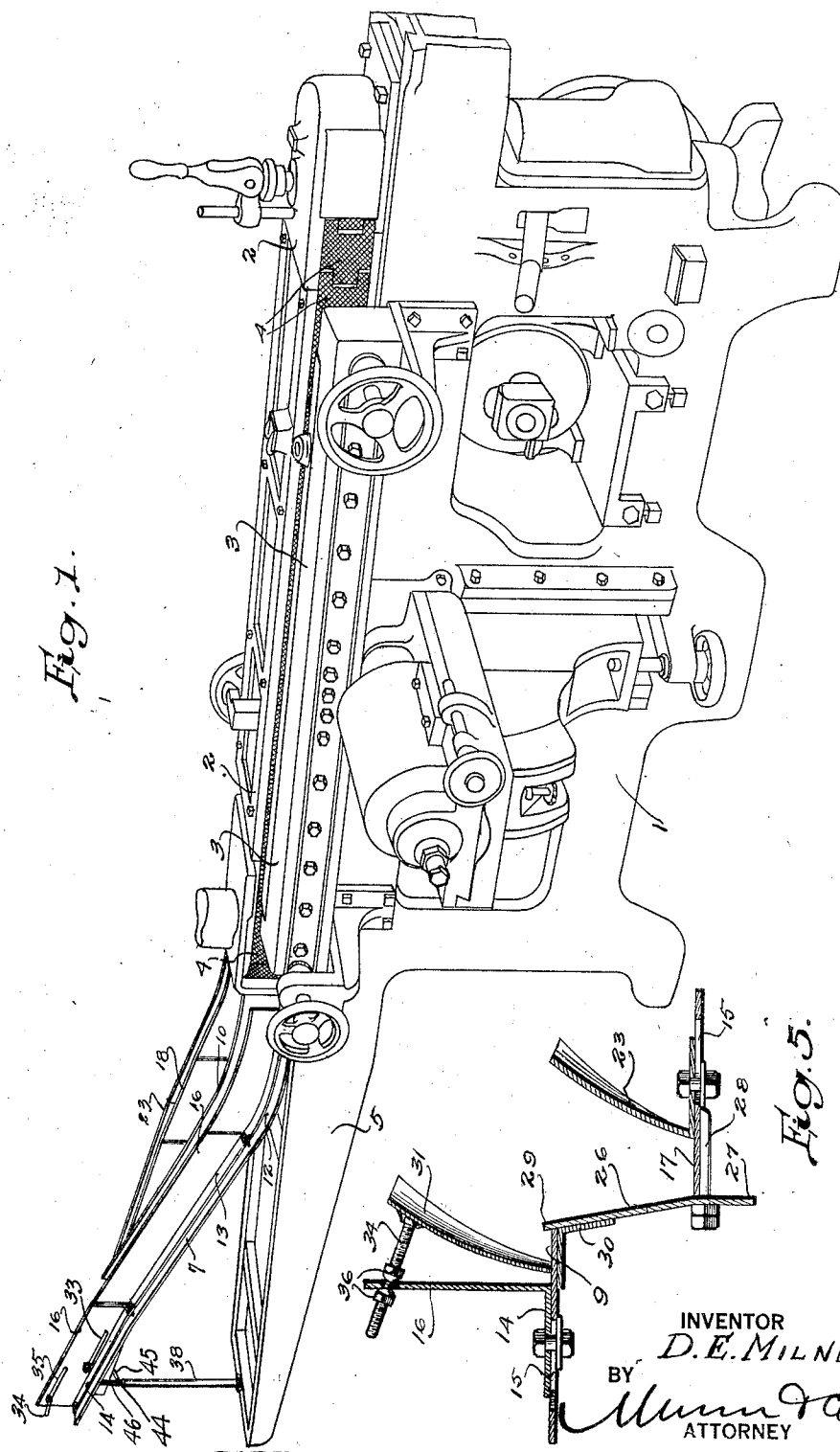
D. E. MILNE

1,734,868

STOCK FEEDING MEANS

Filed Dec. 3, 1927

2 Sheets-Sheet 1



Nov. 5, 1929.

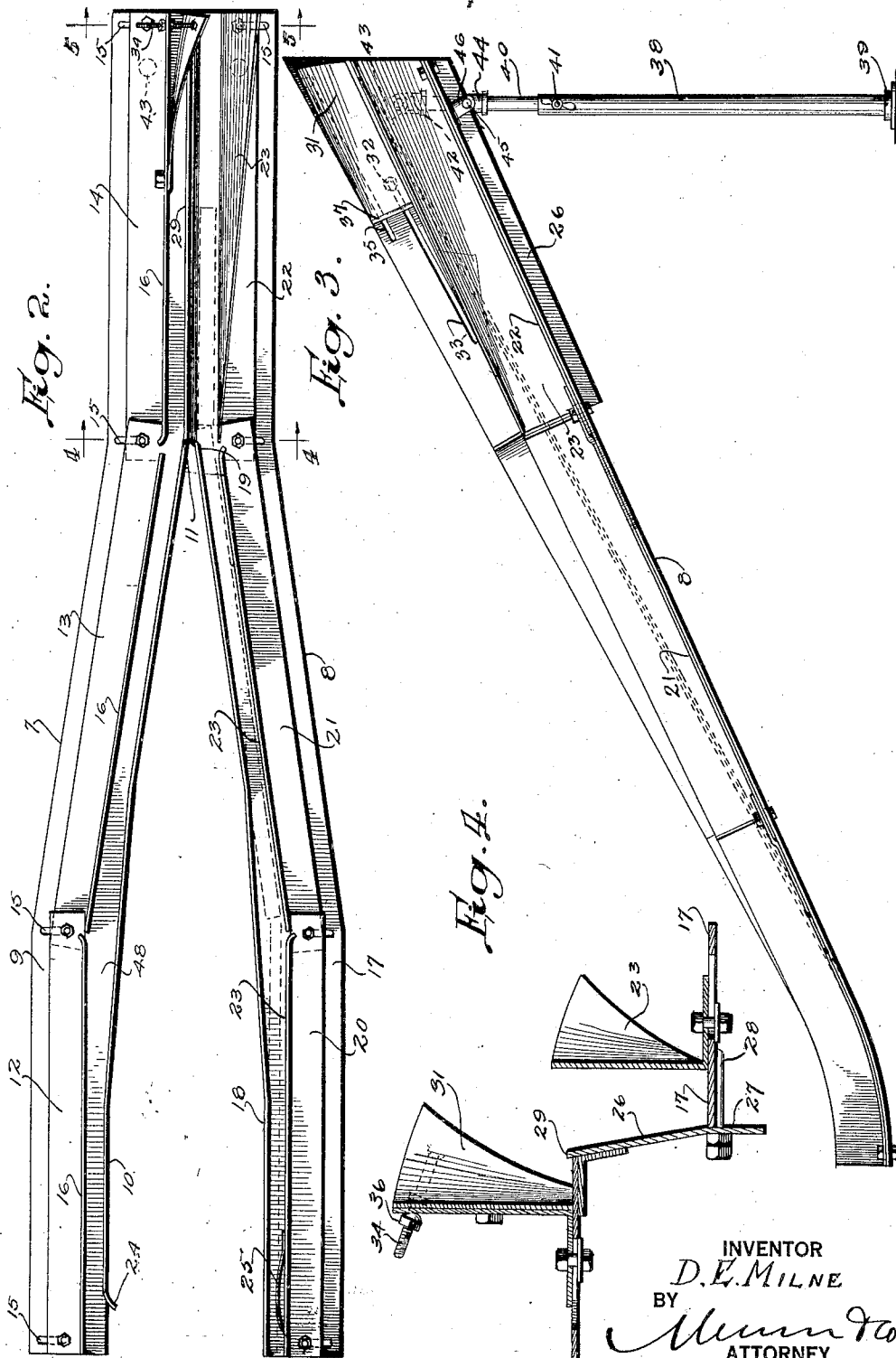
D. E. MILNE

1,734,868

STOCK FEEDING MEANS

Filed Dec. 3, 1927

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

DAVID E. MILNE, OF CHATTANOOGA, TENNESSEE

STOCK-FEEDING MEANS

Application filed December 3, 1927. Serial No. 237,505.

This invention relates to stock feeding means for machines effecting dual operations upon stock, the stock being fed to one part of the machine; operated upon, and then returned to another part of the machine for a subsequent operation.

Previously, this return feed has been accomplished by hand requiring two operators for each machine, one to feed the stock in at one end, and the other to receive the stock and return it to another part of the machine for the second operation.

Mechanically operated return feed mechanisms for accomplishing this purpose have been proposed, but they have the disadvantage of materially adding to the cost of and complicating the operation of the machine.

The object of the present invention is to provide a simple, relatively inexpensive attachment for use in conjunction with such machines in which the stock is automatically turned and fed back by gravity to the machine for the second operation without the use of power operated devices.

A familiar example of machine utilizing this dual operation and return feed is found in the so-called "glue jointer" of the woodworking art, in which the stock is treated by successive operations to prepare for gluing by forming parallel matched tongue and grooves at opposite edges, and while my invention is particularly adapted to, and will be illustrated and described in connection with such a machine, it is not necessarily limited in its application and use to a specific machine having the characteristics described.

It is essential, however, to the operation of the stock return feed, by gravity, that means be provided for feeding the stock discharged from the machine to the point of its transfer to the gravity return feed device. In accordance with the invention, the power of the machine operating upon the stock itself, is utilized to move the stock to the return feed point, so that no mechanism extraneous to the machine itself is needed to effect the automatic return of the stock for the second operation.

The application of the stock conveyor to a machine of this character is shown in the

accompanying drawings as illustrative of the use of the machine. The foregoing objects and features, as well as others will be more clearly apparent from the following detailed specification, when read in connection with these drawings, forming part thereof and in which:

Figure 1 is a perspective view of a glue jointing or edge molding machine such as used in the woodworking art with the stock feeding means of the present invention applied thereto.

Figure 2 is a top plan view of the feeding means or conveyor detached.

Figure 3 is a side elevation thereof on the side of the gravity return feed.

Figure 4 is a transverse sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a transverse vertical section on the line 5—5 of Figure 2.

Referring to these drawings, a glue jointing machine 1, of well known construction, operates upon opposite edges of stock. The central elongated portion 2 at the top of the machine mounts a continuous elliptical stock gripping and feeding belt faced at opposite edges of the machine by similar cooperating stock gripping and feeding mechanisms in spaced parallel relation, one of these mechanisms being shown at 3, and the other of corresponding construction being similarly disposed at the opposite side of the machine. The central elliptical belt, as shown, is composed of links 4 having roughened stock gripping faces. The power control and initial stock feeding end are at the right end of the machine as shown in Figure 1, the stock being fed to the elliptical belt between it and the cooperating feeding mechanism 3 at the side facing the operator and discharging at that side at the far end of the machine where a horizontal extension 5 is provided forming a table. This end 5 of the machine constitutes the initial point of discharge of the stock and the end at which the stock is fed back between the elliptical belt and the cooperating feeding and gripping mechanism 3 at the opposite side of the machine for the second operation thereon as previously described.

It is at this end 5 of the machine that the

device of the present invention is applied. Complementary chutes or runways 7 and 8 extend in angular relation from the discharge and return feed sides of the machine at the end 5 thereof upwardly to a point of junction determinately elevated above the machine, this junction end of the chutes being supported by an adjustable pedestal later to be described, the lower end of which is appropriately and rigidly mounted upon the end of the table 5. The lower end of the chute 7, which I term the feed chute, is positioned at the point of initial discharge of the stock, and is provided with relatively adjustable flanges forming guide walls for the stock as it exits from this end of the machine. The feed chute 7 is formed of an elongated base plate 9 having a plurality of bends, causing the plate to converge toward the longitudinal median line of the jointing machine 1. At its inner edge, the plate 9 is formed with a vertical flange 10 with a series of bends therein likewise converging towards said longitudinal median line, this flange terminating at 11. This flange forms one end of the inner wall of a chute or runway by which the stock initially existing from the jointing machine is guided upwardly in the chute. A cooperating wall, laterally adjustable for different thicknesses of stock, is provided by a plurality of angled sections 12, 13 and 14 adjustably secured to the base plate 9 by bolts carried by the sections entering elongated slots 15 extending laterally of and toward the outer edge of the base plate 9. The abutting ends of the sections 12, 13 and 14 are overlapped, and adjustably mounted, upon the base plate 9 at their junction by the same bolt, these points of junction representing bends in the inner wall formed by the flanges 16 of these angled sections. The common bolt connection for the abutting overlapped ends of the sections forms, in effect, a hinging means by which the angles of junction may be varied. The flanges 16 of the abutting ends at their point of overlap are cut down to permit this overlap, and are preferably bent inwardly, as shown, to allow for relative angular adjustment of the section.

The return chute 8 is of generally similar construction to the feed chute 7 and comprises a base plate 17 having a plurality of similarly, but opposite deflections or bends converging toward the longitudinal median line of the jointing machine at the upper ends of the chutes and, similarly to the chute 7, is provided at its inner edge with an upstanding flange 18 forming the inner guiding wall of the chute, this flange terminating at 19 at a point closely adjacent to the terminating point 11 of the flange of the feed chute 7. Mounted at the outer side of the base plate 17 are a plurality of angled sections 20, 21 and 22 having their abutting ends overlapped in angular relation and connected by a common bolt, as is the feed chute, these bolts and similar bolts at

the ends of the series of sections providing for adjustment of the vertical flanges 23 of the sections laterally of the base plate 17 for different thicknesses or widths of stock, and also providing for angular adjustment of the sections 20, 21 and 22 relatively to each other. The flanges 18 and 23 of the base plate and angled sections, respectively, provide guiding walls for the chute between which the stock slides by gravity to enter the jointing machine for the second operation thereon. The flange 10 of the base plate 9 of the feed chute is preferably cut away at its entrance end for a short distance and bent outwardly, as at 24, to facilitate the entrance of and guide the stock into the chute. At the lower or feeding end of the gravity return chute 8, the flange 23 of the angled section 20, forming the outer guide wall of the chute at this point, is provided adjacent the exit of the chute with a flat leaf spring 25 suitably attached to its flange 23 and serving lightly to press the stock as it exits from the chute against the inner wall, so that it is, or may be, aligned with the stock gripping means at the far side of the jointing machine. The lower end of the gravity return chute 8 is, similarly to the feed chute 7, secured to the table 5 and positioned in close proximity to the entrance of the stock gripping channel.

The structure of the feed and gravity return chutes 7 and 8 at the upper end of the machine is joined, with the upper terminal of the feed chute represented by the angled section 14 thereof at a higher elevation than the adjacent upper end section of the gravity chute represented by the adjustable angle 23 thereof. These two sections at the point of junction have their vertical flanges 10-18 discontinued so that the base plates 9 and 17 present smooth inclined surfaces. The edges of these base plates from the points 11 and 19 upwardly to the end of the chutes are connected by means of an upwardly extending plate 26 (Figures 3, 4 and 5) having a portion 27 extending below the upper end of the base plate 17 rigidly connected thereto by means of studs 28 welded or otherwise secured to the upper end of the base plate and projecting through elongated vertical slots in the depending portion 27 of plate 26, being clamped thereto by suitable nuts engaging the stud. The upper end of the plate 26 which is inclined upwardly toward the adjacent base plate 9 to facilitate the transfer of stock therefrom, extends above the edge of this base plate providing a longitudinal stock turning lip 29 forming, in effect, a lowered continuation of the flange 10. The plate 26 is jointed to the base plate 9 of the feed chute at this point by means of an angled strip 30 which may be welded, bolted, riveted or screwed to the plates 26 and 9, depending upon their composition. The flange 23 of the upper angled section 22 of the gravity return chute is curved outwardly, as best seen

in Figures 2, 4 and 5, this curvature being substantially in consonance with that of the deflecting plate 31 secured to the inner face of the flange 16 of the angled section 14 of the feed chute at its upper end and extending part-way longitudinally of the section. This deflecting plate is for the purpose of engaging the edge of the stock as it enters the upper section of the feed chute and, in cooperation with the turning lip 29, deflecting it laterally into the trough formed by the flange 23, plate 26 and base 17 of the gravity return chute at its upper end. The deflecting plate, as shown in Figures 2 and 4, curves inwardly toward the adjacent return chute so that the stock as it enters the upper end of the feed chute is gradually tilted laterally, aided by the turning lip 29, until the stock is overbalanced or passes the center of gravity and falls into the trough of the return chute. The turning lip 29, in cooperation with the deflecting plate, will cause the stock to be turned axially through a half-turn, thus reversing the position of its edges as it is returned to the machine for a second operation thereon. The deflecting plate 31 may be bodily adjusted longitudinally by means of a bolt 32 extending from the lower edge and end of the plate through a slot 33 running longitudinally of the lower edge of the flange 16 of angled section 14, and by means of the threaded stud 34 having a ball and socket connection to the deflecting plate adjacent its upper edge and end, this stud extending through an elongated slot 35 (Figure 3) in the flange 16 adjacent the upper edge and end with check nuts 36 at opposite sides of the flange. The stud 34 also provides, in addition, for angular adjustment of the deflecting plate inwardly or outwardly to meet the varying conditions for deflection, imposed by stock of varying thickness and height. The lower edge of the deflecting plate is chamfered or bevelled as at 37, Figure 3, to facilitate the turning of the stock and prevent the edge of the deflecting plate from acting as an abutment to arrest further feeding movement of the stock.

The jointed upper ends of the feed and return chutes 7 and 8 are supported as a unit at the desired elevation with the bottom of said chute approximately at the top edge of the return chute as suggested by Figures 4 and 5 by means of a common supporting pedestal 38 having a flanged base 39 to engage and be secured to the table or other support 5 and having a telescoping inner section 40 housed therein and adjustable vertically thereof by means of the set screw 41, the upper end of the inner section 40 of the pedestal carries a stud 42 to the upper end of which is pivotally attached a lug 43 riveted or otherwise secured to the base 9 of the feed chute, and at an appropriate point above its upper end mounts a

collar 44 having an offset arm 45 extending beneath the base 17 of the return chute and mounted in an ear 46 appropriately secured to its underside, thereby bracing the return chute and affording support additional to that provided by the plate 26 and its connections to the plate 17.

To permit the turning or angling of the stock as it passes a bend in the chutes, the walls of the chutes at the bends are spaced further apart or widened as at 48, Figure 2, by extending the inner flanges 10 and 18 of the base plates 7 and 8, respectively. The angled sections of the chutes are adjusted normally to provide sufficient clearance between the walls of the chutes to permit some lateral shifting of the stock as will be evident from the relative position of the chute walls and the stock engaged by the spring 25.

The operation of the described stock feeding means should be obvious from the foregoing description and need not be repeated in detail. Briefly, summed up, the stock initially issuing from the jointing machine and indicated by the numeral 47 in the drawings enters the end 24 of the feed chute and is pushed up the chute by the successive portions of stock as they issue from the jointing machine through the positive feed of the stock through the machine. The various bends in the feed chute formed by joints or bends in the flanges 10 and 16, providing the walls of the chute, will turn the pieces of stock as they are progressively fed up the chute and bring them finally to the extreme upper end of the chute upon which they are retained by the turning lip 29 until such time as the curvature of the deflecting plate 10 has tilted the stock to a point beyond its line of balance or center of gravity, whereupon the turning lip 29 and deflecting plate will cause it to make a half-turn and drop into the bottom of the trough at the upper end of the gravity return chute afforded by the plate 26, flange 23, and base 17, as best seen in Figures 4 and 5, from which point it will descend by gravity to the exit end 25 and move into gripping relation with the stock gripping and feeding means engaging the stock to feed it through the machine for the second operation thereon.

The adjustment provided for the angled plates and for the deflecting plate permits the chutes or runways to be adapted to handle various lengths and cross sections of stock, and the pedestal support permits increase or decrease in the angle or inclination of the chutes to conform to different operating conditions.

A device, such as described when once adjusted to the particular machine, requires practically no attention and in most machines by effecting a double operation on the stock, dispenses with the need of a second operative at the machine. Furthermore, the feed of

stock from, and return of stock to the machine for the second operation is entirely automatic, and effected without the use of power extraneous to that of the machine itself, so that the construction is relatively inexpensive and requires no additional power mechanism for effecting the return of stock to the machine. The construction described, while a preferable one, is intended as illustrative rather than restrictive of the invention, and various structural changes and adaptations may be made in consonance with the spirit of the invention and the scope of the appended claims.

What I claim, therefore, and desire to secure by Letters Patent is:

1. A return feed conveyor comprising complementary chutes diverging downwardly from adjoining elevated ends of different heights to stock receiving and gravity returning lower ends respectively, with means at their adjoining elevated ends for transferring the stock fed upwardly in the chute having the elevated end of greater height from said end of the chute to the adjacent elevated end of less height of the other chute for gravity discharge down said chute.

2. In a return feed conveyor, complementary chutes extending in angular relation downwardly from a common point of elevated support, the upper end of one chute being elevated above and in abutting relation to the other chute and having means thereon effective to transfer stock from the elevated end of the first chute to the lower adjoining elevated end of the second chute to feed downwardly therefrom by gravity stock fed upwardly in the first chute to its elevated end.

3. In a return feed conveyor, complementary chutes extending in angular relation downwardly from a common point of elevated support, the upper end of one chute being elevated above and in abutting relation to the upper end of the other chute and having means thereon effective to transfer stock fed upwardly in the first chute to its elevated end from the elevated end of said chute to the lower elevated end of the adjoining chute to feed downwardly therein by gravity, said means including means effective to turn the stock as it is transferred to said gravity feed chute.

4. A conveyor for returning stock discharged from one portion of a machine to another portion thereof for subsequent operation thereon, comprising a feed chute adapted to be attached at one end to the machine at its initial stock discharge point in alinement with the stock discharging therefrom, said chute inclining upwardly and having its other and upper end determinately elevated, a gravity return feed chute inclining downwardly from a point adjacent to but of less height than the upper end of the first chute with its lower end positioned upon the machine to present the gravity returned

stock thereto for a subsequent operation, with means at the upper end of the first chute for engaging and transferring stock therefrom to the adjacent upper end of the gravity return feed chute.

5. A conveyor for returning stock discharged from one portion of a machine to another portion thereof for subsequent operation thereon, comprising a feed chute adapted to be attached at one end to the machine at its initial stock discharge point in alinement with the stock discharging therefrom, said chute inclining upwardly and having its other and upper end determinately elevated, a gravity return feed chute inclining downwardly from an upper end in juxtaposition to but of less elevation than the upper end of the first chute with its lower end position upon the machine to present the return stock thereto for a subsequent operation, with means at the upper end of the first chute for transferring stock therefrom to the adjacent upper end of the gravity return feed chute, said means including a member positioned in the path of stock transferring movement and effective to turn the stock axially as it is transferred to the gravity chute.

6. A conveyor for transferring stock from one portion of a machine to another for a subsequent operation thereon comprising an upwardly inclining feed chute and a downwardly inclining gravity stock return chute in divergent angular relation, means supporting the upper ends of said chutes in juxtaposition with the upper end of the feed chute at a higher elevation, and means at the upper end of the feed chute for transferring stock therefrom to the adjoining gravity return chute.

7. In combination with a machine having a pair of positive work gripping and feeding mechanisms for presenting stock for successive operations thereon by the machine, a return feed conveyor for returning stock discharged by one gripping mechanism to the second gripping mechanism for a second operation upon the stock, comprising a feed chute having one end mounted in juxtaposition to and alinement with the discharge end of one gripping and feeding mechanism and inclined upwardly, a second and gravity return chute inclining downwardly from an upper elevated end of less height positioned adjacent to the higher upper end of the first chute and terminating with its lower discharge end alined with and in operative relation to the stock receiving end of the second stock gripping and feeding means, and means carried by the feed chute at its upper end for transferring stock fed upwardly to its upper end over on to the adjacent upper end of the gravity return chute.

8. In combination with a machine having a pair of positive work gripping and feeding

mechanisms for presenting stock for successive operations thereon by the machine, a return feed conveyor for returning stock discharged by one gripping mechanism to the
 5 second gripping mechanism for a second operation upon the stock comprising a feed chute having one end mounted in juxtaposition to and alinement with the discharge end of one gripping and feeding mechanism with
 10 its other end determinately elevated above and in juxtaposition with the elevated end of a gravity return feed chute extending downwardly to and mounted on the machine with its discharge end alined with and in opera-
 15 tive relation to the stock receiving end of the second stock gripping and feeding means, and means carried by the feed chute at its end for transferring stock therefrom to the upper end of the gravity return chute, said
 20 transferring means comprising a stock deflecting member and stock turning means positioned in the path of stock transferring movement and effective to turn the stock axially as it is transferred to the gravity
 25 chute.

9. A return feed conveyor comprising complementary chutes extending downwardly in divergent angular relation from adjoining upper ends of different elevations to stock
 30 receiving and gravity discharging ends, respectively, means at the adjoining upper ends of the chutes for transferring stock from one chute to the adjoining elevated end of the other chute, said chutes having guiding walls
 35 relatively adjustable laterally for different widths of stock.

10. A return feed conveyor comprising complementary chutes diverging from adjoining ends of different elevations to stock
 40 receiving and gravity discharging ends, respectively, means at said adjoining elevated ends of the chutes effective to transfer stock from the upper to the lower chute, said chutes having a plurality of bends in their diverging
 45 portions with widened portions at said bends facilitating turning of the stock.

11. A return feed conveyor comprising complementary chutes extending in angular relation from adjoining connected portions
 50 supported at different elevations, means on the uppermost of said chutes to engage stock fed thereto and deflect it to the adjoining lower chute, said deflecting means presenting a deflecting surface adjustably inclined
 55 toward the adjoining lower chute.

12. A return feed conveyor comprising complementary walled chutes extending in angular relation from adjoining connected portions supported at different elevations, the
 60 adjacent walls of the chutes at said connecting portions being cut away to permit stock transfer, and a stock deflecting and transfer member mounted on the upper-most of the adjoining chute portions to engage stock fed
 65 thereto and deflect it to the adjoining lower

chute, said deflecting member being bodily adjustable longitudinally of its chute for different lengths of stock and presenting a deflecting surface adjustably inclined toward the adjacent lower chute.

13. A stock feeding chute comprising an elongated base plate having a continuous up-
 70 standing flanged edge forming a chute wall having bends therein providing successive sections in angular relation, and a series of
 75 angled plates superposed on the base plates with upstanding sides forming the opposite wall of the chute, said angled plates having their abutting ends overlapped and pivotally
 80 connected for relative angular adjustment conformably to the base plate and being mounted thereon for bodily transverse ad-
 justment to vary the width of the chute between said walls.

Signed at Chattanooga in the county of
 Hamilton and State of Tennessee this 28th
 day of November, A. D. 1927.

DAVID E. MILNE.

70

75

80

85

90

95

100

105

110

115

120

125

130