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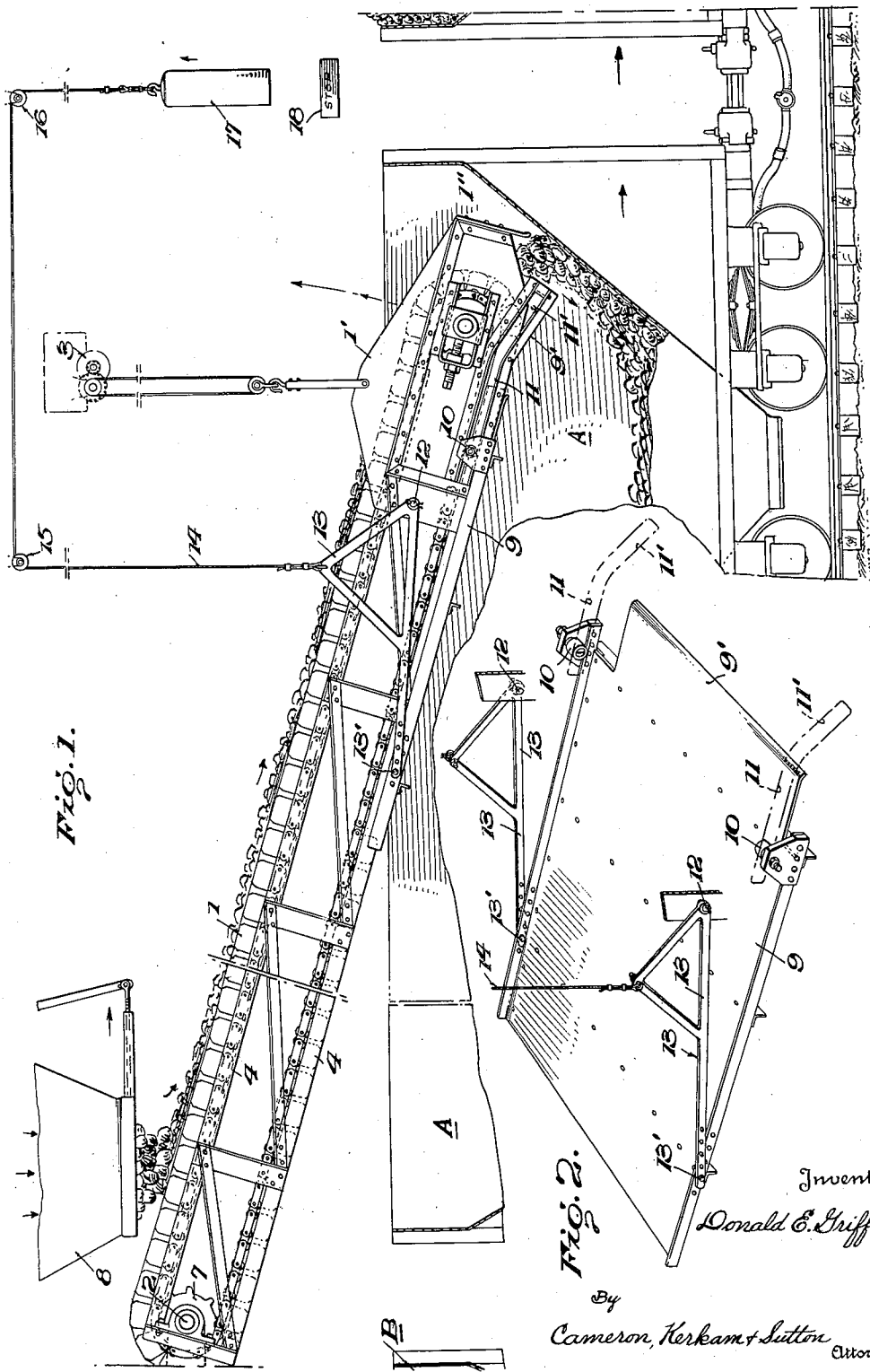
D. E. GRIFFITH

2,091,505

CONVEYER BOOM

Filed May 6, 1935

3 Sheets-Sheet 1



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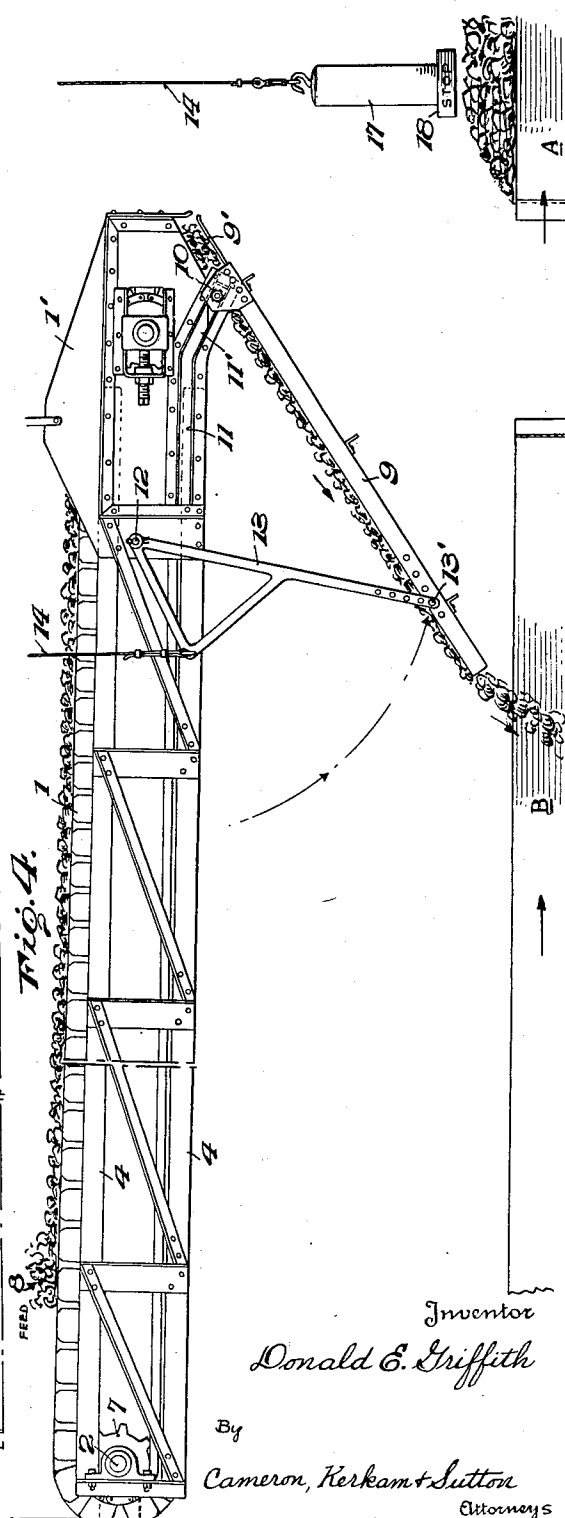
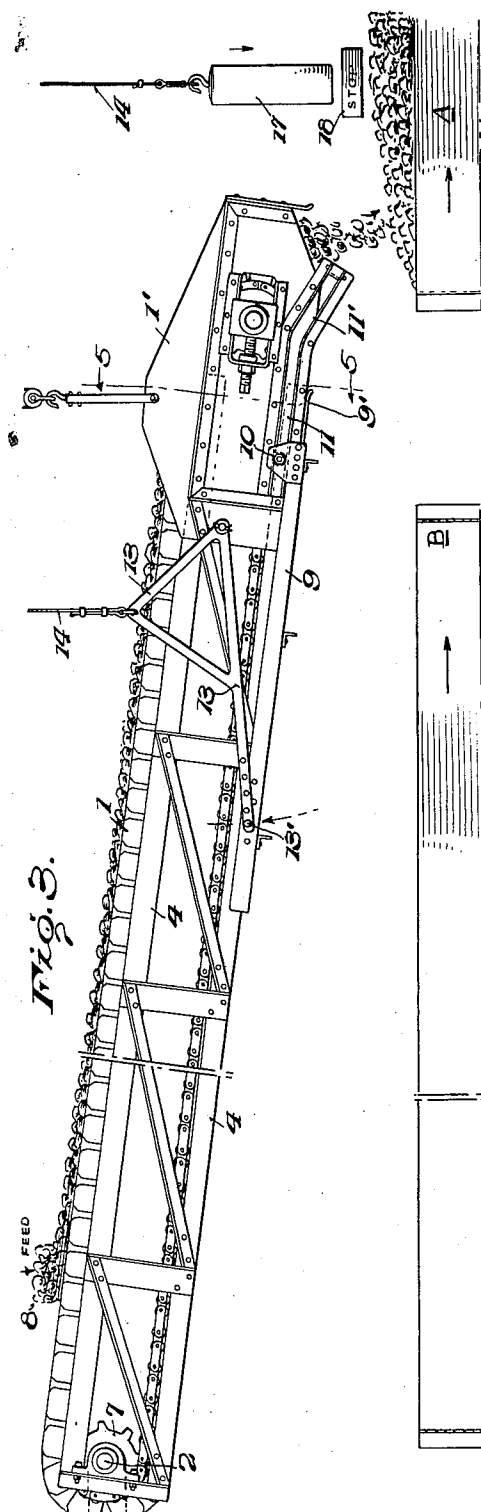
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3 Sheets-Sheet 3

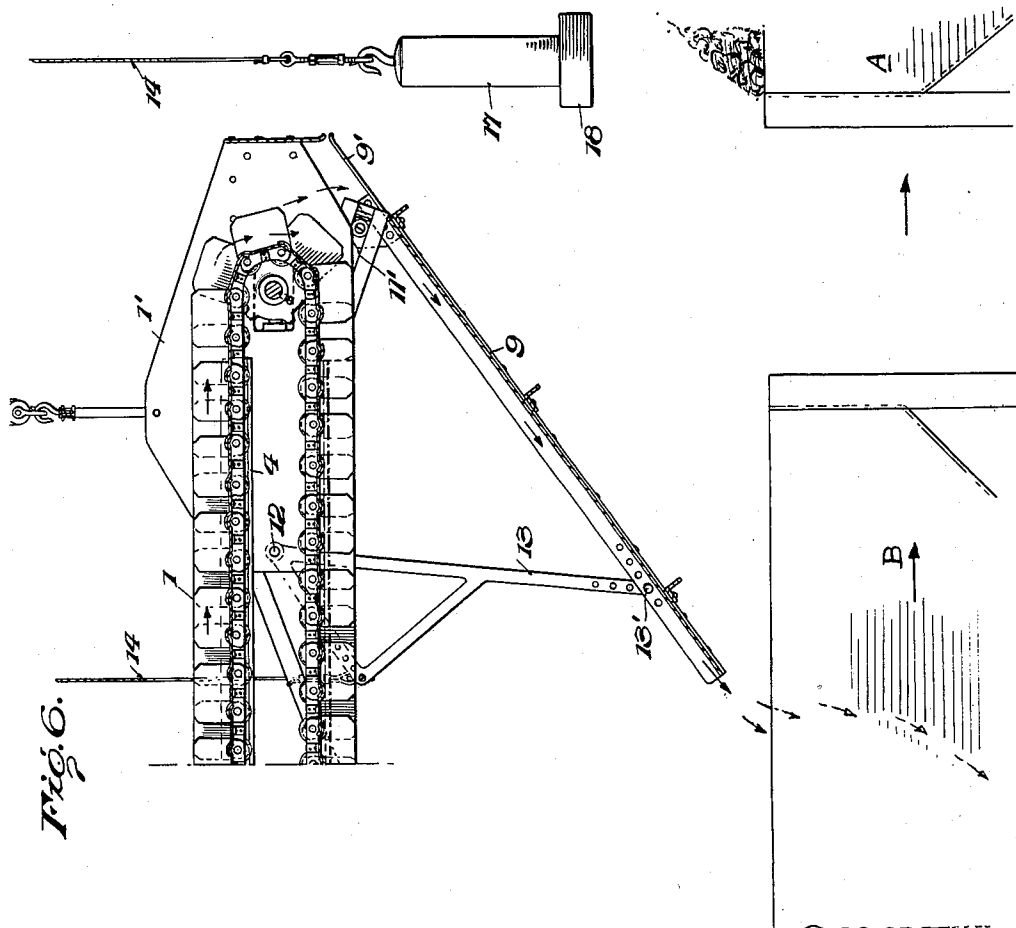


Fig. 6.

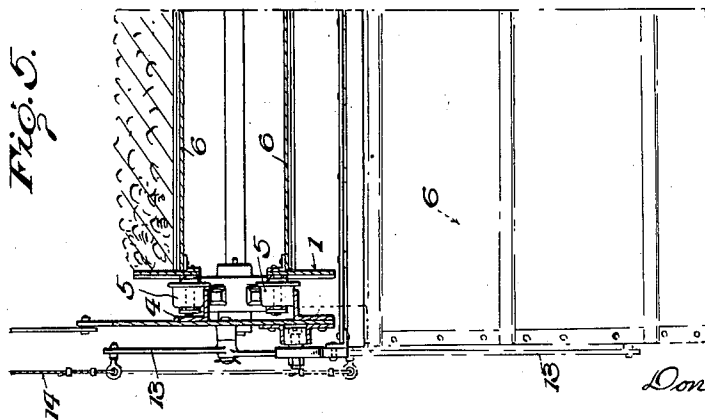


Fig. 5.

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UNITED STATES PATENT OFFICE

2,091,505

CONVEYER BOOM

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Application May 6, 1935, Serial No. 20,068

10 Claims. (Cl. 198—72)

This invention relates to conveyer booms, such for example, as those employed in transferring coal from mine cars to railway cars during the loading operation of the latter.

5 There are in common use conveyer booms mounted near the receiving end thereof upon horizontal axes in order that the delivery end may be raised and lowered during the transfer operation, and such booms are provided with
10 moving parts which receive the coal from the mine car and advance the same along the booms to the delivery end thereof where it is delivered into the railway car. During the loading operation the railway car is moved past the delivery
15 end of the boom to the end that as the front portion of the car becomes loaded, the coal may be delivered further and further to the rear in the car until the rear end of the car is reached and fully loaded, when the car is advanced to
20 bring the front end of the next succeeding car under the delivery end of the boom. During this advancing period from one car to another, either the delivery of coal from the boom has to be temporarily suspended, or if it is continued, coal is
25 dropped to the ground between the cars, and if the succeeding car fails to move forward as designed, large amounts of coal are thus dumped upon the ground. A stoppage of the moving parts of the boom during the shift from one car
30 to another and the starting of the same when the next succeeding car is in position involves a loss of time and a loss of power. On the other hand, if the moving parts are not stopped, the large amount of coal falling to the ground between
35 cars not only interrupts forward movement of the succeeding car, but also involves the expenditure of much labor in transferring the coal from the ground into the car.

The primary object of the present invention is
40 to provide means whereby the delivery of coal from the delivery end of the boom shall continue delivery of coal without interruption after one car is loaded and another is being advanced and without the spilling of coal to the ground
45 between the cars, thereby increasing the rapidity with which the loading operation is conducted, and saving power and labor.

With this end in view, the invention consists
50 of a conveyer boom of the usual or any desired construction mounted to swing on a horizontal axis to the end that the delivery end thereof may be raised or lowered, combined with a transfer chute so arranged that, as the delivery end of the conveyer boom is raised to permit the suc-
55 ceeding car to be advanced, the conveyer boom

may continue to deliver the coal which is received by the transfer chute and, the latter being rearwardly inclined downward from the delivery end of the boom, receives the coal from the delivery end of the boom and deposits it in the forward end of the next succeeding car. When the succeeding car is advanced so as to bring the forward end thereof beneath the delivery end of the conveyer boom, the latter is lowered to facilitate the delivery of the coal therefrom into the forward end of the car, and the transfer chute is automatically thrown out of operation. Preferably this latter action, throwing the transfer chute out of operation, is accomplished by means of a power device which folds the transfer chute upward under the conveyer boom, and also preferably shifts said transfer chute longitudinally of the boom to the end that it will no longer receive coal from the boom but will permit the coal to be delivered from the boom directly into the car. Preferably the transfer chute is mounted to turn on a horizontal axis formed by pivots thereon engaging longitudinally extending grooved tracks or ways on opposite sides of the delivery end of the boom; and preferably also the power device employed is that of a weight heavier than the transfer chute and so connected to the latter that it will, when free to act, raise the transfer chute into a folded position under the delivery end portion of the boom. When the delivery end of the boom is raised the weight is permitted to descend and during the period while it is descending it continues to hold the transfer chute in its folded non-operative position, but when the transfer chute has been raised to a certain degree, the weight is thrown out of operation, as by coming in contact with a suitable stop, and thereafter the continued raising of the boom permits the rear end of the transfer chute to fall under the influence of gravity and to bring the forward end thereof into position to receive the coal from the delivery end of the boom.

The inventive idea is capable of receiving a variety of mechanical expressions, one of which, for the purpose of illustrating the invention, is shown in the accompanying drawings, but it is to be expressly understood that such drawings are for the purpose of illustration only and are not designed to define the limits of the invention, reference being had to the appended claims for this purpose.

In said drawings—

Fig. 1 is a side elevation of the transfer boom

in position to deliver coal to the forward end of a railway car;

Fig. 2 is a perspective view of the transfer chute;

Fig. 3 is a perspective view of the conveyer boom in the position which it occupies when the railway car has been almost completely filled at its rear end;

Fig. 4 is a like view of the conveyer boom with the delivery end thereof fully raised and the transfer chute in position to receive the coal therefrom and deliver it into the next succeeding car to the rear;

Fig. 5 is a sectional view on the lines 5—5 of Fig. 3; and

Fig. 6 is a central, vertical, longitudinal section of the delivery end of the boom when the parts are in the position shown in Fig. 4.

Referring to the drawings in which like reference numerals indicate like parts throughout the several views, 1 indicates a conveyer boom mounted to turn on a horizontal axis 2 at its rear end, and 3 indicates any suitable power device for raising the forward or delivery end 1' of the boom. As here shown, this conveyer boom consists generally stated, of a frame 4 preferably composed of angle bars constituting upper and lower tracks or ways along which rollers 5—5 of an endless conveyer 6 travel, the said endless conveyer being driven from any suitable source or power by means, for example, of a sprocket wheel 7. When transferring coal from the mine car 8 (Fig. 1) to railway cars, the delivery end of the boom is lowered as indicated in Fig. 1, so that the boom is in a position having a decided downward inclination from its axis 2, and the conveyer mechanism advances the coal from the mine car 8 to the delivery end of the boom where, it will be observed, there is provided an end piece 1'', to the end that the coal as delivered by the conveyer shall be delivered downward and shall not be projected forward beyond the delivery end of the boom; and the present invention contemplates the provision of means whereby when the delivery end of the boom is in lowered position, as shown in Fig. 1, coal shall be freely delivered from the delivery end and in a downward direction. As the car, here lettered A in Fig. 1, is placed in position, the forward end of the car is loaded, the car during the loading operation being shifted from left to right, as indicated by the arrows. During the loading operation of the forward end of the car, the conveyer boom is gradually elevated to the end that the coal may be freely delivered therefrom, and this is continued until the forward end of the car is loaded to the desired level, whereupon the delivery end of the boom may be again lowered, if desired, and the operation repeated. When, however, the car A (Fig. 3) has been advanced and fully loaded and it is desired to bring the next car B into position under the delivery end of the conveyer boom, means are provided by the present invention whereby the conveyer boom may continue to deliver coal but without any of said coal falling between the cars A and B, and to this end there is provided a transfer chute 9 (Figs. 2, 3 and 4), which is mounted to turn at its forward end on a horizontal axis, here shown as taking the form of two pivot pins 10 (Fig. 2) which are mounted to turn in and to travel in longitudinally extending slots or grooved ways 11—11 on opposite sides of the forward or delivery end of the conveyer boom. These two tracks or ways 11—11 are, for a portion of their length, approximately parallel

with the bottom of the conveyer boom, but at their extreme forward ends 11' they are inclined forward and downward. It will be observed that the transfer chute 9 has a portion 9' extending forward of the axle pins 10—10 of the transfer chute.

Fulcrumed at 12 on the conveyer boom is a lever 13, one arm of which is connected at 13' to the rear end portion of the transfer chute and the other arm is connected to a cable 14 which passes up over suitable pulleys 15 and 16, and has a weight 17 connected thereto, this weight constituting a power device operating through the cable 14 and the lever 13 to hold the transfer chute 9 folded up beneath the conveyer boom, since the weight 17 is great enough to overcome the tendency of gravity to lower the chute.

As will be understood from an inspection of Fig. 2, there are two of the levers 13, one on either side of the conveyer boom. As stated, when the delivery end of the conveyer boom is in its lowered position, as shown in Fig. 1, the transfer chute 9 is held by the weight 17 folded up underneath the conveyer boom. As the delivery end of the conveyer boom, however, is raised, the weight 17 descends, but during such descent it continues to hold the chute 9 folded up under the boom until the delivery end of the boom has been raised far enough to permit the weight 17 to come into contact with the stop 18, when the weight no longer acts as a power device to hold the chute in its upper position. The stop 18 is so placed that the weight 17 will come in contact therewith only at the time when the delivery end of the boom is raised well above the surface of the car A (Fig. 3) wherein is shown the position of the parts just before the weight comes in contact with the stop 18. Further elevation of the delivery end of the boom (say to a position slightly below that shown in Fig. 4) results in the weight 17 coming in contact with the stop 18 and releases the transfer chute from control of the lever. Thereupon, acting under the influence of gravity, the chute tends to move downward around its axis 10, but in doing so, it is controlled by the lever 13 and the axis pins 10—10 of the chute are forced forward along the grooved tracks or way 11—11 on the delivery boom, thus bringing the forward portion 9' of the transfer chute under the extreme delivery end of the boom. The axis pins 10—10 of the transfer chute meanwhile traverse the downwardly inclined portions 11' on the tracks or ways 11. This movement of the axis pins 10—10 along the grooves 11 increases the distance between said pins and fulcrums 12—12 of the levers 13—13, and the parts are so proportioned that when the forward part 9' of the transfer chute is immediately under the extreme delivery end of the conveyer boom, the chute is free to move downward around the axis pins 10—10 into the position shown in Figs. 4 and 6. In this position the rearward and lower end of the transfer chute 9 is over the forward end of the car B, and the upper and forward end 9' of the transfer chute is immediately under the conveyer boom and receives the coal therefrom, as will be readily understood from an inspection of Figs. 4 and 6.

When the car B is advanced to the point where the forward end thereof is under the delivery end of the conveyer boom, the conveyer boom is lowered well down into the car, that is, into the same position as the delivery end of the boom shown in car A of Fig. 1. This lowering of the delivery end of the boom puts a strain

on the cable 14, resulting in lifting the weight 17 from the stop 18 and in first folding the transfer chute upward under the boom and then in shifting it along the tracks or ways 11 into the position shown in Figs. 1 and 3. It will thus be seen that the conveyer boom is in continuous operation, delivering coal from the mine car to the railway cars, and this without the possibility of any coal being spilled or falling between the cars A and B after the car A is filled and while the car B is being shifted into position to come under the delivery end of the boom.

While reference has been specifically made to the transfer of coal from a mine car to railway cars, it will be readily understood that the invention is equally applicable to the transfer and delivery of other materials. Moreover, while the power device for holding the transfer chute in elevated position or for shifting it from its lower position to its elevated position, is here shown as a weight, any other suitable power device, capable of performing these functions and of being automatically shifted out of operative action, may be substituted therefor.

Other modifications and variations of the construction herein shown may be employed without departing from the spirit of the invention as defined in the claims hereof, and such modifications and variations as fall within the terms of the claims are intended to be covered thereby.

Having thus described the invention, what is claimed is:

1. The combination of a conveyer boom shiftable about a horizontal axis to raise and lower the delivery end thereof, a transfer chute beneath the delivery end of said boom for receiving material from the boom and delivering it in a direction the reverse of that of said boom, and means actuated by the raising and lowering of the boom and shifting said chute into and out of receiving relation with the delivery end of the boom when said delivery end is raised and lowered.

2. The combination of a conveyer boom shiftable about a horizontal axis to raise and lower the delivery end thereof, a transfer chute carried by the boom beneath the delivery end thereof for receiving material from the boom and delivering it in a direction the reverse of that of said boom, and means automatically shifting said chute into and out of receiving relation with the delivery end of the boom when the latter is raised and lowered.

3. The combination of a conveyer boom shiftable about a horizontal axis to raise and lower the delivery end thereof, a transfer chute mounted on and extending rearward beneath the delivery end of the boom for receiving material from the boom and delivering it in a direction the reverse of that of said boom, and means automatically shifting said chute into and out of receiving relation with the delivery end of the boom as said delivery end is raised and lowered.

4. The combination of a conveyer boom shiftable about a horizontal axis to raise and lower the delivery end thereof, a transfer chute mounted on and beneath the delivery end of the boom to turn on a horizontal axis for receiving material from the boom and delivering it in a direction the reverse of that of said boom, and means shifting said chute about its axis and into and out of receiving relation with the delivery end of the boom when said delivery end is raised and lowered.

5. The combination of a conveyer boom shiftable about a horizontal axis to raise and lower

the delivery end thereof, a transfer chute mounted beneath the delivery end of said boom to turn on a horizontal axis for receiving material from the delivery end of the boom and delivering said material in a direction the reverse of that of said boom, and means shifting the axis of the chute longitudinally of the boom and turning said chute into and out of receiving relation with the delivery end of the boom when said delivery end is raised and lowered.

6. The combination of a conveyer boom shiftable about a horizontal axis to raise and lower the delivery end thereof, a transfer chute beneath said boom and pivoted to the delivery end thereof, a power device holding said chute folded up under said boom when the delivery end of the boom is lowered, and means relieving the chute from the action of said power device when the delivery end of the boom is raised, whereby said chute turns on its axis into a downwardly and rearwardly inclined position when the delivery end of the boom is raised.

7. The combination of a conveyer boom shiftable about a horizontal axis to raise and lower the delivery end thereof, a transfer chute mounted beneath the delivery end of the boom on a horizontal axis shiftable longitudinally of the boom, a lever fulcrumed on the boom and having one arm operatively connected to the chute, a power device in operative relation with the other arm of said lever and acting to hold said chute folded up under the boom when the delivery end thereof is lowered, and means automatically relieving said lever from the action of said power device when the delivery end of the boom is raised.

8. The combination of a conveyer boom shiftable about a horizontal axis to lower and raise the delivery end thereof and having longitudinally extending tracks or ways on each side of said delivery end, a rearwardly extending transfer chute beneath said delivery end and having pivots engaging said tracks or ways, and means shifting said pivots along said track or ways and turning said chute on said pivots when the delivery end of the boom is raised or lowered.

9. The combination of a conveyer boom shiftable on a horizontal axis to lower and raise the delivery end thereof, a rearwardly extending transfer chute pivoted beneath the delivery end of the boom, a weight operatively connected to said chute and holding the same folded up beneath the boom when the delivery end of the boom is in lowered position, and a stop receiving and supporting said weight when the delivery end of the boom is raised.

10. The combination of a conveyer boom shiftable on a horizontal axis to lower and raise the delivery end thereof, a rearwardly extending transfer chute having pivots travelling in longitudinally extending tracks or ways on opposite sides of the delivery end of the boom, a lever fulcrumed on the boom and having one arm connected to said chute, a weight connected to the other lever arm and acting to hold the chute folded up beneath the boom when the delivery end of the boom is in lowered position and a stop receiving said weight when the delivery end of the boom is raised, whereby the chute is permitted to turn on its pivots under the action of gravity when the delivery end of the boom is raised.

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