

June 30, 1936.

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2,046,016

LOADING MACHINE

Original Filed Sept. 24, 1934 2 Sheets-Sheet 1

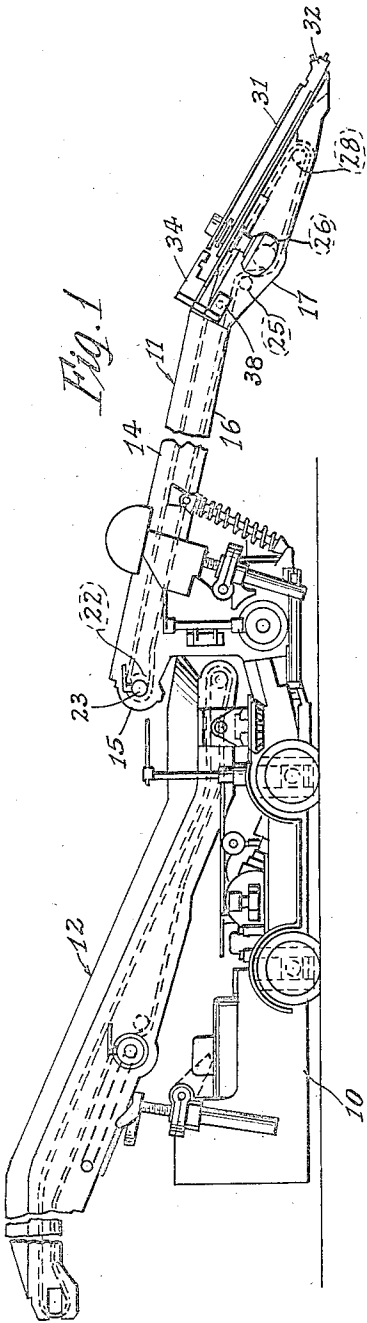


Fig. 1

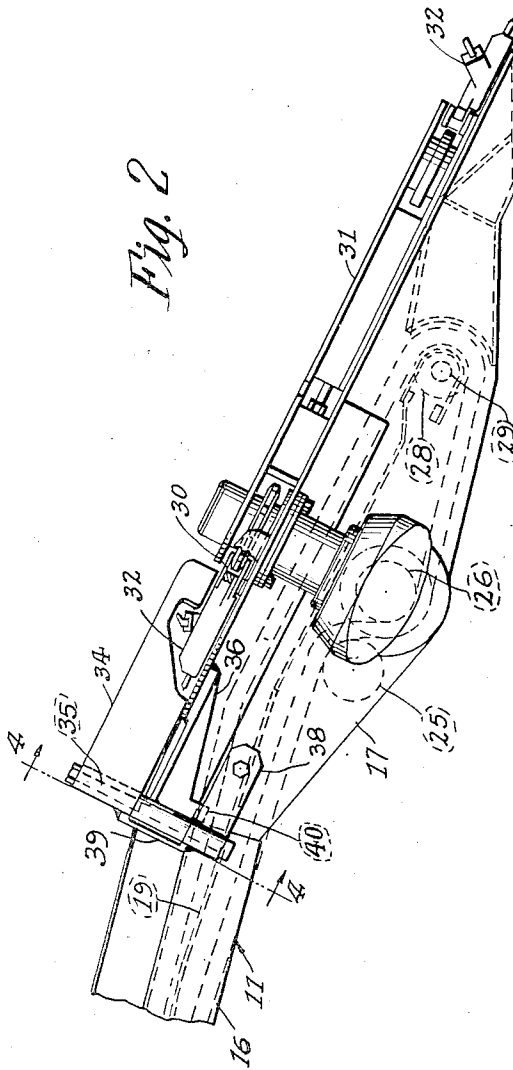


Fig. 2

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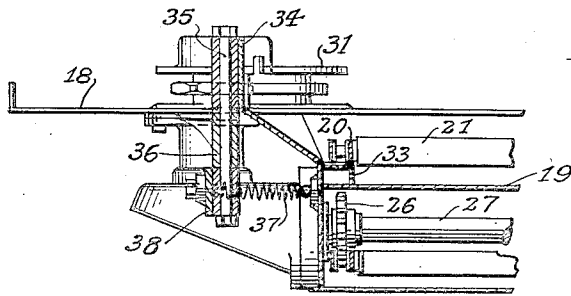
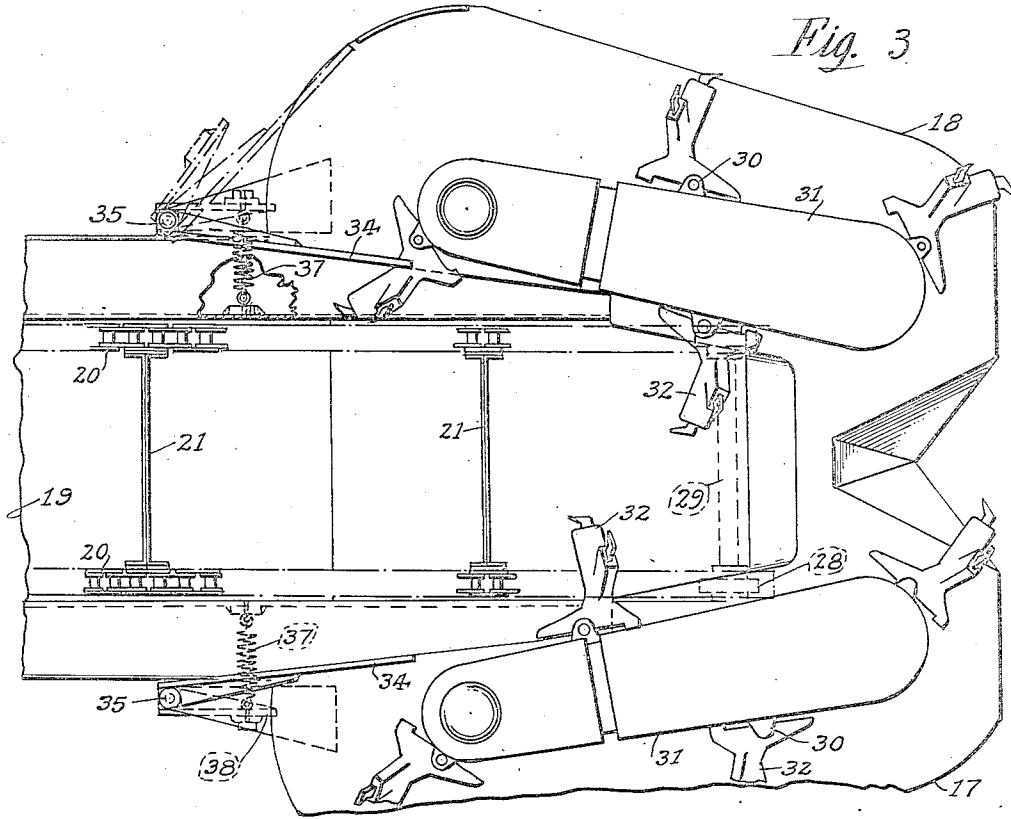
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# UNITED STATES PATENT OFFICE

2,046,016

## LOADING MACHINE

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Application September 24, 1934, Serial No. 745,202  
Renewed November 29, 1935

15 Claims. (Cl. 198—8)

This invention relates to improvements in loading machines of the type adapted to load coal at the working face of a mine and more particularly to the gathering head for initially picking up the loose material and loading it onto a flight conveyer for discharge into a mine car or the like.

The principal object of my invention is to provide a means for stripping material from the gathering arms as they turn away from the inclined conveyer to prevent said arms from carrying material therebeyond.

My invention may be more clearly understood by reference to the accompanying drawings wherein:

Figure 1 is a side elevation of a loading machine having the features embodying my invention incorporated therein;

Figure 2 is an enlarged side elevation of the gathering mechanism of the machine shown in Figure 1 showing details of the stripping mechanism to which my present invention is directed;

Figure 3 is an enlarged fragmentary plan view of the gathering mechanism showing certain details of the stripping mechanism to which my present invention is directed; and

Figure 4 is a fragmentary sectional view taken substantially along line 4—4 of Figure 2.

Referring now in particular to the drawings, the main elements of the loading machine disclosed therein are essentially the same as shown in my prior applications, Serial Nos. 682,248 and 705,486, filed July 26, 1933, and January 6, 1934, respectively. Said main elements will only be described in a general way in order to illustrate one form in which my improved stripping means may be applied.

In the form shown, the loading machine consists of a wheel truck or main frame 10 having a horizontally and vertically swingable gathering and loading element 11 mounted at the front end thereof and extending forwardly therefrom, and a discharge conveyer 12 extending from beneath the rear end of said loading element and upwardly and rearwardly therefrom, overhanging the rear end of the main frame for discharging material into suitable receiving means, such as mine cars or the like.

The gathering and loading element 11 may, as usual, comprise a conveyer frame 14 supported between trunnion supports 15, 15 for pivotal movement about a transverse axis disposed adjacent the rearward end thereof. Said trunnion supports are in turn pivotally supported on the main frame for swinging said conveyer frame about a vertical axis and positioning said gathering and

loading element at varying positions relative to said main frame. The mechanism for pivotally swinging said trunnion supports 15, 15 on said main frame and for pivotally swinging said conveyer frame on said trunnion supports is not herein shown or described, since it forms no part of my present invention and is fully disclosed in my prior application, Serial No. 682,248.

The inclined conveyer frame 14, as herein shown, preferably comprises a rearward conveyer section 16 and a forward gathering section 17 connected thereto in a suitable manner. Said forward gathering section has a widened apron 18 formed integral therewith and extending forwardly therefrom in an inclined plane for engaging the ground.

The forward and rearward portions 17 and 16 of the frame 14 are provided with a material conveyer, herein comprising a central portion or pan 19 forming a surface for moving material therealong. The moving parts of the conveyer consist of a pair of parallel-spaced chains 20, 20 having material engaging cross members or flights 21, 21 carried therebetween at suitable intervals. Said chains are trained around suitable sprockets 22, 22 adjacent the rear end of the machine on a transversely extending drive shaft 23 coaxial with the axis of pivotal connection of the frame 14 with the trunnion supports 15, 15. Said shaft is suitably driven in a manner similar to that previously disclosed in my prior application, Serial No. 682,248.

The conveyer chains 20, 20 extend forwardly from the sprockets 22, 22 beneath the pan 19 over idler rollers 25, 25 and under drive sprockets 26, 26 keyed on a transversely extending shaft 27 for driving the latter shaft. From thence the chains 20, 20 extend forwardly around idler rollers 28, 28 on a transverse shaft 29 journaled adjacent the front end of the section 17 and below the apron 18. From thence said chains pass along a pair of guide rails 33, 33 spaced above the upper surface of the pan 19 to a point adjacent the section 16 where they pass along the upper surface of said pan.

The mechanism for gathering material and depositing it on said conveyer comprises a pair of endless chains 30, 30 mounted on chain guiding members 31, 31 for orbital movement thereabout and having material gathering arms 32, 32 extending laterally therefrom and pivotally mounted thereon for limited pivotal movement about an axis which is perpendicular to their plane of travel. Said chain guiding members are mounted on the apron 18 adjacent opposite sides

of the conveyer section 17 and are so arranged that said chains may move in orbital paths along opposite sides of said conveyer from a point disposed forwardly of the forward end thereof in a manner similar to that disclosed in my prior application, Serial No. 706,486, previously referred to. Said gathering mechanism need not herein be described in greater detail, excepting to point out that it is driven by the transverse shaft 27 through a suitable gear train (not shown) in a usual manner.

In order to clearly understand the novel features of my invention, it should be observed that the speed of the conveyer is usually much greater than that of the gathering devices and that the point where the gathering devices turn away from the conveyer is disposed above and to one side of said conveyer a distance sufficient to prevent the sweeping of material therefrom when said conveyer is normally loaded. In conditions, however, where the conveyer is heavily loaded and where the entire gathering mechanism and conveyer is buried under the coal, the tendency for the gathering devices to carry material beyond the conveyer is increased. In order to overcome any such tendency, a pair of stripping plates 34, 34 are provided. One of these plates is arranged on each side of the conveyer in such a manner that each plate may strip material from the gathering arms 32, 32. The construction of each of these stripping plates is similar, so a description of one will suffice for a clear understanding of both.

The stripping plate 34 is pivoted to the frame 14 rearwardly of the gathering mechanism on the upper end of a pin 35. Said pin is carried in a bracket 36 secured to the outer side of said conveyer frame and the axis of said pin is substantially perpendicular to the plane of movement of the gathering arms 32. Said stripping plate is normally adapted to extend forwardly of the pin 35 in a direction substantially parallel to the insides of the apron 18 where it meets the sides of the conveyer frame 14 and has a portion which extends over and above the path of said gathering arms. The portion of said stripping plate extending over and above the path of said gathering arms is cut away so as to form an opening conforming to the form of each gathering arm, through which said gathering arms may pass (see Figure 2). Said stripping plate is inclined with respect to the side of the conveyer at an angle less than the angle of divergence of the gathering device with respect to said conveyer, so that as said gathering arms turn away from the conveyer and approach said stripping plate, material will be deflected onto the conveyer by said gathering arms when said stripping plate is relatively immovable with respect to said gathering arms.

A suitable means is provided to normally hold said stripping plate from movement relative to said gathering arms but permitting yieldable pivotal movement of said stripping plate when large lumps of material become wedged between one of said gathering arms and stripping plate to allow said lumps to pass to prevent fouling of the gathering devices. Said means, as herein shown, comprises a relatively heavy tension spring 37. Said tension spring is connected to the conveyer frame 14 adjacent one of its ends and to an arm 38 adjacent its opposite end in a suitable manner. Said last-mentioned arm is mounted on the lower end of the pin 35 and extends forwardly therefrom in the same general direction as

the stripping plate 34. The arm 38 and plate 34 may be integrally formed, but as herein shown, they are connected together by means of a connecting piece 39 in a suitable manner, such as welding. A stop 40 is adapted to engage the arm 38 to limit pivotal movement of said stripping plate beyond the inside edge of the apron 18.

It will thus be seen that as the gathering arms 32, 32 approach the stripping plates 34, 34, material will be swept from said gathering arms and deflected onto the conveyer by said stripping plates. In case a large lump of material becomes fouled between a gathering arm and stripping plate, said stripping plate will yieldably move about the axis of the pin 35 until the lump has been freed, whereupon said plate will be returned to its initial position by the spring 37. It should be understood that the tension of said spring is such that the stripping plates remain stationary under normal conditions and will only be pivoted upon fouling of a gathering arm with said stripping plate.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction and arrangement of the various parts may be changed or altered without departing from the spirit or scope thereof. Furthermore, I do not wish to be construed as limiting myself to the precise construction illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In combination with a loading machine a conveyer, a gathering device adapted to discharge material onto said conveyer including an orbitally guided endless chain having gathering arms extending therefrom at spaced intervals therealong, and means for stripping material from said gathering arms as they turn away from said conveyer comprising a resiliently mounted pivoted plate extending over the upper portion of said gathering device.

2. In combination with a loading machine, a conveyer, a gathering device adapted to discharge material onto said conveyer including an orbitally guided endless chain having gathering arms extending therefrom at spaced intervals therealong, and means for stripping material from said gathering arms as they turn away from said conveyer comprising a resiliently mounted stripping plate extending over said gathering arms as they approach said stripping plate, said stripping plate having a portion thereof cut away to substantially conform to the form of said gathering arms.

3. In combination with a loading machine, a conveyer, a gathering device adapted to discharge material onto said conveyer including an orbitally guided endless chain having gathering arms extending therefrom at spaced intervals therealong in a plane substantially parallel to the plane of travel of said endless chain, and means for stripping material from said gathering arms as they turn away from said conveyer comprising a plate resiliently mounted for pivotal movement about an axis substantially perpendicular to the plane of travel of said endless chain, and having a free end extending over the path of travel of said gathering arms.

4. In combination with a loading machine, a conveyer, a gathering device adapted to discharge material onto said conveyer including an orbitally guided endless chain having gathering arms extending therefrom at spaced intervals therealong in a plane substantially parallel to the plane of travel of said endless chain, and means for strip-

ping material from said gathering arms as they turn away from said conveyer comprising a plate pivoted adjacent one of its ends for movement about an axis perpendicular to the plane of travel of said gathering arms and having a free end extending over said gathering arms, and resilient means reacting against said plate to permit yieldable movement of said plate about said pivotal axis.

5 10 5. In combination with a loading machine, a conveyer, a gathering device adapted to discharge material onto said conveyer including an orbitally guided endless chain having gathering arms extending therefrom at spaced intervals therealong in a plane substantially parallel to the plane of travel of said endless chain, and means for stripping material from said gathering arms as they turn away from said conveyer comprising a plate pivoted adjacent one of its ends for movement about an axis perpendicular to the plane of travel of said gathering arms and having a free end extending over said gathering arms, and a spring reacting against said plate to permit yieldable pivotal movement thereof.

20 25 6. In combination with a loading machine, a conveyer, a gathering device adapted to discharge material onto said conveyer including an orbitally guided endless chain having gathering arms extending therefrom at spaced intervals therealong in a plane substantially parallel to the path of travel of said endless chain, and means for stripping material from said gathering arms as they turn away from said conveyer comprising a plate pivoted adjacent one of its ends for movement about an axis perpendicular to the plane of travel of said gathering arm and having a free end extending over and conforming to the form of said gathering arms, and a spring reacting against said plate to permit yieldable movement thereof.

30 35 7. In a loading machine, a conveyer, a gathering device extending along one side of said conveyer including an orbitally guided endless chain having gathering arms extending therefrom at spaced intervals therealong, and means for stripping material from said arms as they turn away from said conveyer comprising a pivoted plate extending over said gathering arms and having a portion thereof substantially conforming to the form of said gathering arms, and yieldable means reacting against said plate.

40 45 50 8. In a loading machine, an inclined conveyer, gathering mechanism for moving material onto said inclined conveyer comprising an orbitally guided endless chain extending forwardly of and along one side of said inclined conveyer and having a plurality of laterally extending gathering arms spaced therealong, and means for preventing material from being carried beyond said conveyer by said gathering arms comprising a stripping plate mounted for pivotal movement about an axis substantially perpendicular to the plane of travel of said gathering arms, said stripping plate having a free end extending towards and over said gathering arms and having an under portion conforming substantially to the form of said gathering arms to permit said arms to pass there-through.

55 60 65 70 75 9. In a loading machine, an inclined conveyer, gathering mechanism for moving material onto said inclined conveyer comprising an orbitally guided endless chain extending forwardly of and along one side of said inclined conveyer and having a plurality of laterally extending gathering arms spaced therealong, and means for preventing material from being carried beyond said con-

veyer by said gathering arms at their upper turning point comprising a stripping plate mounted for pivotal movement about an axis substantially perpendicular to the plane of travel of said gathering arms, said stripping plate having a free end extending towards and over said gathering arms and having an under portion conforming substantially to the form of said gathering arms to permit said arms to pass therethrough, and yieldable means reacting against said stripping plate to permit yieldable pivotal movement thereof.

10. In a loading machine, a conveyer, a gathering device extending along one side of said conveyer from a point disposed forwardly of the forward end thereof and diverging therefrom, said gathering device including an orbitally guided endless chain turning away from said conveyer rearwardly of the forward end thereof and having gathering arms extending laterally therefrom at spaced intervals therealong, and means for stripping material from said arms as they turn away from said conveyer comprising a plate pivoted rearwardly of the turning point of said gathering arms away from said conveyer for yieldable pivotal movement about an axis perpendicular to the plane of travel of said gathering arms, said plate extending towards and over the path of said gathering arms at an angle which is less than the angle of divergence of said gathering device away from said conveyer.

30 35 40 45 50 11. In a loading machine, a conveyer, a gathering device extending along one side of said conveyer from a point disposed forwardly of the forward end thereof and diverging therefrom, said gathering device including an orbitally guided endless chain turning away from said conveyer rearwardly of the forward end thereof and having gathering arms extending laterally therefrom at spaced intervals, therealong, and means for stripping material from said arms as they turn away from said conveyer comprising a plate pivoted rearwardly of the turning point of said gathering arms away from said conveyer for restricted movement about an axis perpendicular to the plane of travel of said gathering arms, said plate extending towards and over the path of said gathering arms and being yieldably held in a position so that its longest side is at an angle with respect to said conveyer which is less than the angle of divergence of said gathering device away from said conveyer.

55 60 65 70 75 12. In a loading machine, a conveyer, a gathering device extending along one side of said conveyer from a point disposed forwardly of the forward end thereof and diverging therefrom, said gathering device including an orbitally guided endless chain turning away from said conveyer rearwardly of the forward end thereof and having gathering arms extending laterally therefrom at spaced intervals therealong, and means for stripping material from said arms as they turn away from said conveyer comprising a plate pivoted rearwardly of the turning point of said gathering arms away from said conveyer for restricted movement about an axis perpendicular to the plane of travel of said gathering arms, said plate extending towards and over the path of said gathering arms and having an under portion formed to conform to the shape of said gathering arms to permit said gathering arms to pass therethrough, said plate having yieldable means connected thereto for restraining pivotal movement thereof.

13. In a loading machine, an inclined conveyer, gathering mechanism for moving material onto said inclined conveyer comprising a pair of orbitally guided endless chains having a plurality of 75

laterally extending gathering arms spaced there-  
along, each of said endless chains extending along  
a side of said inclined conveyer from a point dis-  
posed forwardly of the forward end thereof, and  
5 means to prevent material from being carried be-  
yond the sides of said inclined conveyer by said  
gathering arms as they leave said inclined con-  
veyer comprising a stripping plate pivotally  
10 mounted for movement about an axis perpendicu-  
lar to the plane of travel of said endless chains and  
disposed rearwardly of each of said endless chains,  
each of said stripping plates extending towards  
and over said endless chains.

14. In a loading machine, an inclined conveyer,  
15 gathering mechanism for moving material onto  
said inclined conveyer comprising a pair of or-  
bitally guided endless chains having a plurality of  
laterally extending gathering arms spaced there-  
along, each of said endless chains extending along  
20 a side of said inclined conveyer from a point dis-  
posed forwardly of the forward end thereof, and  
means to prevent material from being carried be-  
yond the sides of said inclined conveyer by said  
gathering arms as they leave said inclined con-  
25 veyer comprising a pair of stripping plates pivot-

ally mounted for movement about axes disposed  
rearwardly of and perpendicular to the plane of  
travel of said endless chains, each of said strip-  
ping plates extending towards and over said end- 5  
less chains and having yieldable means connected  
thereto for restraining pivotal movement thereof.

15. In a loading machine, an inclined conveyer,  
gathering mechanism for moving material onto  
said inclined conveyer comprising a pair of orbi- 10  
tally guided endless chains having a plurality of  
laterally extending gathering arms spaced there-  
along, each of said endless chains extending along  
a side of said inclined conveyer from a point dis-  
posed forwardly of the forward end thereof, and  
means to prevent material from being carried be- 15  
yond the sides of said inclined conveyer by said  
gathering arms as they leave said inclined con-  
veyer comprising a pair of stripping plates pivot-  
ally mounted for movement about axes disposed  
rearwardly of and perpendicular to the plane of 20  
travel of said endless chains, each of said strip-  
ping plates extending towards and over said end-  
less chains and having a spring connected thereto  
for restraining pivotal movement thereof.

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