April 12, 1938. J. F. JOY 2,113,761

MATERIAL HANDLING MECHANISM

Original Filed July 1, 1935

Fig. 1.

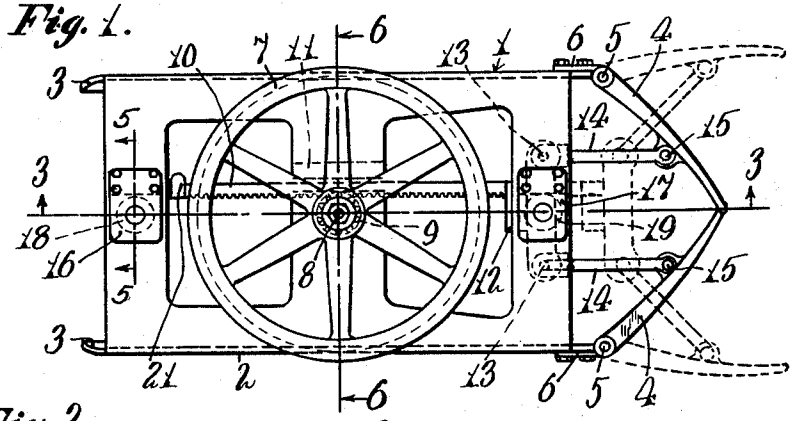


Fig. 2.

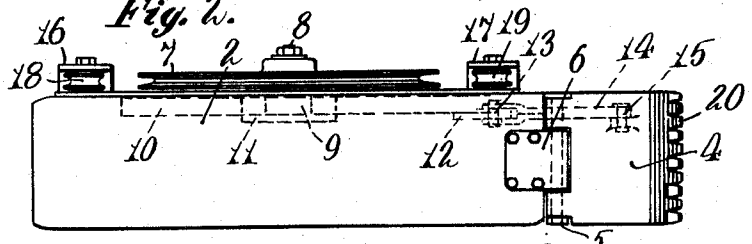


Fig. 3.

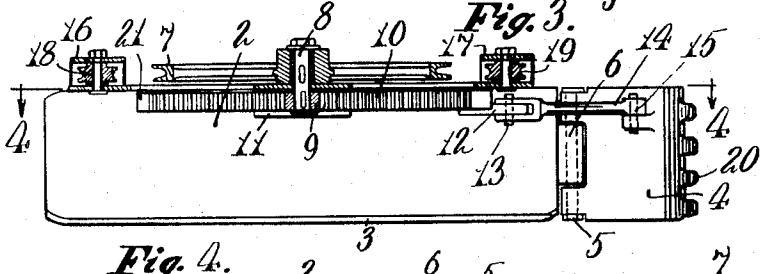


Fig. 4.

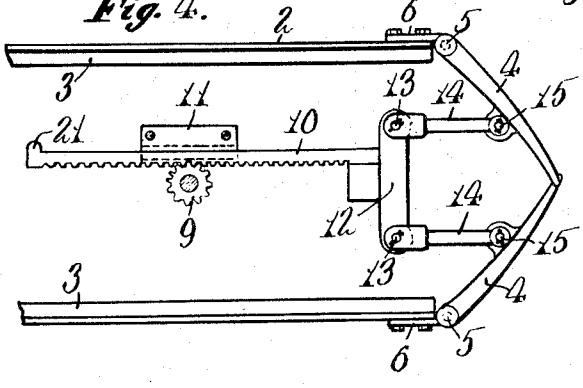


Fig. 5.

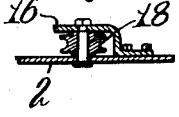
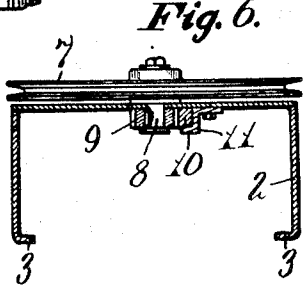


Fig. 6.



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2,113,761

MATERIAL HANDLING MECHANISM

Joseph F. Joy, Claremont, N. H., assignor to Sullivan Machinery Company, a corporation of Massachusetts

Original application July 1, 1935, Serial No. 29,308. Divided and this application March 19, 1936, Serial No. 69,697

18 Claims. (Cl. 37—136)

This invention relates to material handling mechanism, and more particularly to improvements in a scraper loading mechanism of the drag line scraper type.

An object of this invention is to provide an improved scraper loading mechanism. Another object is to provide an improved scraper loading mechanism especially designed to use in handling loose material and embodying an improved drag line operated scraper mechanism. Still another object is to provide an improved scraper loader mechanism having embodied therein improved means for penetrating and gathering the material to be loaded. Yet another object of this invention is to provide an improved scraper mechanism having improved material penetrating and gathering means and improved means for moving the latter into its penetrating and gathering positions. These and other objects and advantages of the invention will, however, hereinafter more fully appear.

This application is a division of my copending application, Serial No. 29,308, filed July 1, 1935.

In the accompanying drawing there is shown for purposes of illustration one form which the invention may assume in practice.

In this drawing,—

Fig. 1 is a plan view showing the illustrative form of the improved drag scraper loader mechanism.

Fig. 2 is a side elevational view of the mechanism shown in Fig. 1.

Fig. 3 is a view in longitudinal section taken substantially on line 3—3 of Fig. 1.

Fig. 4 is a horizontal view with parts omitted taken substantially on line 4—4 of Fig. 3.

Fig. 5 is a detail sectional view taken on line 5—5 of Fig. 1.

Fig. 6 is a cross sectional view taken substantially on line 6—6 of Fig. 1.

In this illustrative embodiment of the invention there is shown an improved scraper loader mechanism generally designated 1, particularly adapted for loading loose material in mines, and herein of the type especially designed to use with a drag line scraper hoisting mechanism of the character described in my copending application, Serial No. 69,696, filed March 19, 1936. The improved scraper loader mechanism comprises a box-like scraper frame 2 having bottom side runners 3, 3 adapted to rest upon and slide over an underlying surface, herein slidingly engageable with the mine floor. The scraper frame 2 is open at its forward and rearward ends, and pivotally mounted at the forward open end of the scraper frame are cooperating material penetrating and gathering elements 4, 4 of claw-like form, these gathering elements being pivotally mounted about vertical axes at 5 on brackets 6 secured to the opposite side walls of the scraper frame. Journaled on the top of the scraper frame is a large horizontal pulley wheel 7 keyed to a vertical shaft 8 journaled within the top of the scraper frame. As shown in Fig. 3, keyed to the lower end of the shaft 8 and driven thereby is a spur gear 9 meshing with the teeth of a rack 10 guided for longitudinal sliding movement in a guideway 11 secured beneath the top of the scraper frame. Secured to the forward end of the rack 10 is an eye member 12 having pivotally connected thereto at 13, 13 links 14, 14, the latter in turn being pivotally connected at 15 to the gathering elements 4. As shown in Fig. 5, journaled within brackets 16 and 17 secured to the top of the scraper frame at the opposite ends of the latter respectively at the rear of and in advance of the pulley wheel 7 are horizontal guide sheaves 18 and 19. The forward penetrating edges of the claw-like gathering arms or blades 4 are formed with tooth-like serrations 20 for facilitating penetration of the material during the gathering operation. In this instance, one cable portion of the drag line hoist is adapted to extend from one hoisting drum about the rear guide sheave 18, around the pulley wheel 7 and about the front guide sheave 19 forwardly to a suitable guide pulley anchored in advance of the scraper mechanism, and the other cable portion extends from its anchored guide pulley back to the other drum of the hoisting mechanism, so that when the hoisting drums are operated, in the manner clearly described in the above mentioned copending application, one cable portion is paid out from one drum while the other cable portion is wound in by the other drum, so that the moving cable portion engaging the pulley wheel 7 rotates the pulley wheel to effect forward sliding movement of the rack 10 to swing the gathering blades 4, 4 from their closed position indicated in full lines in Fig. 1 to the open dotted line position in that figure. When the gathering blades are in their wide open position, a stop lug 21 on the rear end of the sliding rack 10 engages the rear end of the rack guide 11 to prevent further outward swinging movement of the gathering blades. Upon continued winding in of the drag line cable, the scraper mechanism is moved bodily with the moving cable portion toward the material to be loaded to cause the gathering elements to

penetrate the material. Upon reversal of the hoisting drums, the rack 10 is moved rearwardly with respect to the scraper frame by the moving cable portion engaging the pulley wheel to cause the gathering elements to swing inwardly from the dotted line position shown in Fig. 1 to their closed position shown in full lines in that figure, and upon continued movement of the hoisting cable, the scraper mechanism is moved bodily rearwardly with the cable to move the material grasped by the gathering blades in the rearward direction to a suitable point of disposal. The operations of moving the scraper mechanism forwardly to penetrate the material, closing the gathering blades to grasp the material and moving the scraper loader mechanism bodily rearwardly to drag the material to a suitable point of disposal occur in rapid succession, and as the material is loaded, the scraper mechanism is advanced toward and from the material under the control of the hoisting drums. These and other methods of use and advantages of the improved drag line scraper loader mechanism will be clearly apparent to those skilled in the art.

While there is in this application specifically described one form which the invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a scraper loader mechanism, a scraper frame, material gathering means movably mounted on said frame for gathering the material to be loaded and moving the same within said frame, and means for moving said gathering means with respect to said scraper frame comprising a rotatable actuating member mounted on said frame and operatively connected to said gathering means, said actuating member adapted for actuation by the cable of a hoist and rotatable selectively in opposite directions to effect movement of said gathering means into and out of gathering position with respect to said scraper frame.

2. In a scraper loader mechanism, a scraper frame slidable over an underlying surface, material gathering means movably mounted on said frame for gathering the material to be loaded and moving the same within said frame, and means for moving said gathering means with respect to said scraper frame comprising a rotatable actuating member mounted on said frame and operatively connected to said gathering means, said rotatable member adapted for actuation by the cable of a hoist and rotatable selectively in opposite directions to effect movement of said gathering means into and out of gathering position with respect to said frame.

3. In a scraper loader mechanism, a scraper frame slidable over an underlying surface, material gathering means mounted on said frame including cooperating pivoted gathering elements for gathering the material to be loaded and moving the same within said frame, and means for moving said gathering elements with respect to said scraper frame comprising a rotatable actuating member mounted on said frame and operatively connected to said gathering elements, said rotatable member adapted for actuation by the cable of a hoist and rotatable selectively in opposite directions to effect movement of said gathering elements into and out of gathering position with respect to said frame.

4. In a scraper loader mechanism, a scraper frame, pivotally mounted gathering elements on said frame, and means mounted on said frame for swinging said gathering elements into and out of their gathering position including a rotatable actuating member mounted on said frame and operatively connected to said gathering elements, said rotatable member adapted for actuation by the cable of a hoist and rotatable selectively in opposite directions to move said gathering elements into and out of their gathering position with respect to said frame.

5. In a scraper loader mechanism, a scraper frame, pivotally mounted gathering elements on said frame, and means mounted on said frame for swinging said gathering elements into and out of their gathering position including a sliding rack guided on said frame and operatively connected to said gathering elements, a gear for sliding said rack and a rotatable actuating member for said gear and adapted for actuation by the cable of a hoist.

6. In a scraper loader mechanism, a scraper frame, pivotally mounted gathering elements on said frame, and means mounted on said frame for swinging said gathering elements into and out of their gathering position including a sliding rack guided on said frame and operatively connected to said gathering elements, a gear for sliding said rack and a pulley wheel on said frame for rotating said gear.

7. In a scraper loader mechanism, a scraper frame, material penetrating and gathering elements mounted on said frame for movement relative thereto into and out of material penetrating and gathering position and into a position for retaining the material within said scraper frame during transfer of the material, and means for moving said penetrating and gathering elements relative to said frame comprising a rotatable member journaled on said frame and adapted for actuation by the cable of a hoist, and a moving member guided on said scraper frame and operatively connected to said penetrating and gathering elements, said moving member actuated relative to said frame by said rotatable member.

8. In a scraper loader mechanism, a scraper frame, material penetrating and gathering elements pivotally mounted on said frame to swing horizontally relative thereto into and out of material penetrating and gathering position and into a position for retaining the material within said scraper frame during transfer of the material, and means for swinging said penetrating and gathering elements relative to said frame comprising a rotatable member journaled on said scraper frame and adapted for actuation by the cable of a hoist, and a moving member guided on said scraper frame and operatively connected to said penetrating and gathering elements, said moving member actuated relative to said frame by said rotatable member.

9. In a scraper loader mechanism, a scraper frame, material penetrating and gathering elements mounted on said frame for movement relative thereto into and out of material penetrating and gathering position and into a position for retaining the material within said scraper frame during transfer of the material, and means for moving said penetrating and gathering elements relative to said frame comprising a rotatable

member journaled on said scraper frame and adapted for actuation by the cable of a hoist, a member rotated by said rotatable member and likewise journaled on said scraper frame, and a cooperating axially movable moving member guided on said scraper frame and actuated axially by said last mentioned rotatable member, said axially movable member operatively connected to said penetrating and gathering elements.

10. In a scraper loader mechanism, a scraper frame, pivotally mounted gathering elements on said frame, and means mounted on said frame for swinging said gathering elements into and out of their gathering position including means providing a horizontal guideway, a rack slidably guided in said horizontal guideway and operatively connected to said gathering elements, and a gear journaled on said scraper frame and meshing with the teeth of said rack.

11. In a scraper loader mechanism, a scraper frame, gathering elements pivotally mounted on said frame to swing horizontally with respect thereto, and means mounted on said frame for swinging said gathering elements into and out of said gathering position including a sliding rack guided on said frame, a member secured to said rack, links pivotally connecting said member to said gathering elements, and a gear journaled on said frame and meshing with the teeth of said rack for sliding the latter.

12. In a scraper loader mechanism, a scraper frame, material penetrating and gathering elements mounted on said frame for movement relative thereto into and out of material penetrating and gathering position and into a position for retaining the material within said scraper frame during transfer of the material, and means for moving said penetrating and gathering elements relative to said frame including cooperating, relatively movable intermeshing actuating elements mounted on said frame, and means on said frame and adapted for actuation by the cable of a hoist for relatively moving said intermeshing elements, one of said intermeshing elements operatively connected to said penetrating and gathering elements.

13. In a scraper loader mechanism, a scraper frame movable bodily to receive and transfer material and adapted to receive material to be moved by it, between its ends, material penetrating and gathering elements mounted on said frame for movement relative thereto into and out of longitudinally extending material penetrating and gathering position and into a position to form an end-closure for retaining the material within said scraper frame during transfer of the material by bodily movement of said scraper frame, and means for moving said penetrating and gathering elements relative to said frame comprising cooperating relatively movable, mechanically interengaged elements, one element movable axially relative to the other and operatively connected to each of said penetrating and gathering elements, and a power actuated element journaled on said frame for effecting relative movement of said mechanically interengaged elements.

14. In a scraper loader mechanism, a scraper frame, material gathering elements mounted on said frame for movement relative thereto into and out of material gathering position, and means for moving said gathering elements relative to said frame comprising a pulley journaled on said frame and adapted for actuation by a cable of a hoist, and relatively movable, mechanically interengaged elements carried by said frame, one of said elements actuated by the rotation of said pulley and the other element actuated by said pulley-actuated-element and operatively connected to said gathering elements.

15. In a scraper loader mechanism, a scraper frame, material gathering elements mounted on said frame for movement relative thereto into and out of material gathering position, and means for moving said gathering elements relative to said frame comprising a pulley journaled on said frame and adapted for actuation by a cable of a hoist, guide pulleys journaled on said frame for guiding a cable relative to said pulley, and relatively movable, mechanically interengaged elements carried by said frame, one of said elements actuated by the rotation of said pulley and the other element actuated by said pulley-actuated-element and operatively connected to said gathering elements.

16. In a scraper loader apparatus, a scraper frame slidable over a supporting surface toward and from the material to be loaded, material penetrating means mounted on said frame and movable with respect thereto for penetrating the material to be loaded and to move and retain the material within the scraper frame, and means adapted for actuation by the cable of a hoist for moving said material penetrating means into and out of material penetrating position with respect to said frame comprising a slide bar guided on said scraper frame for axial movement in a direction lengthwise of said frame and connecting means operatively connected to said material penetrating means and actuated by said slide bar.

17. In a scraper loader apparatus, a scraper frame slidable over a supporting surface toward and from the material to be loaded, material penetrating means mounted on said frame and movable with respect thereto for penetrating the material to be loaded and to move and retain the material within the scraper frame, and means adapted for actuation by the cable of a hoist for moving said material penetrating means into and out of material penetrating position with respect to said frame comprising a slide bar guided on said scraper frame for axial movement in a direction lengthwise of said frame and means including pivoted links for connecting said slide bar to said material penetrating means and actuated by said slide bar.

18. In a scraper loader apparatus, a scraper frame slidable over a supporting surface toward and from the material to be loaded, material penetrating means mounted on said frame and movable with respect thereto for penetrating the material to be loaded and to move and retain the material within the scraper frame, and means adapted for actuation by the cable of a hoist for moving said material penetrating means into and out of material penetrating position with respect to said frame comprising a slide bar guided on said scraper frame for axial movement in a direction lengthwise of said frame, actuating means operatively connected to said material penetrating means and actuated by said slide bar, and stop means on said frame for limiting movement of said slide bar when said material penetrating means has moved into its material penetrating position.

JOSEPH F. JOY.