G. R. NAGLE, DEC'D.

MRS. DAISY NAGLE, ADMINISTRATRIX.

AGITATOR.

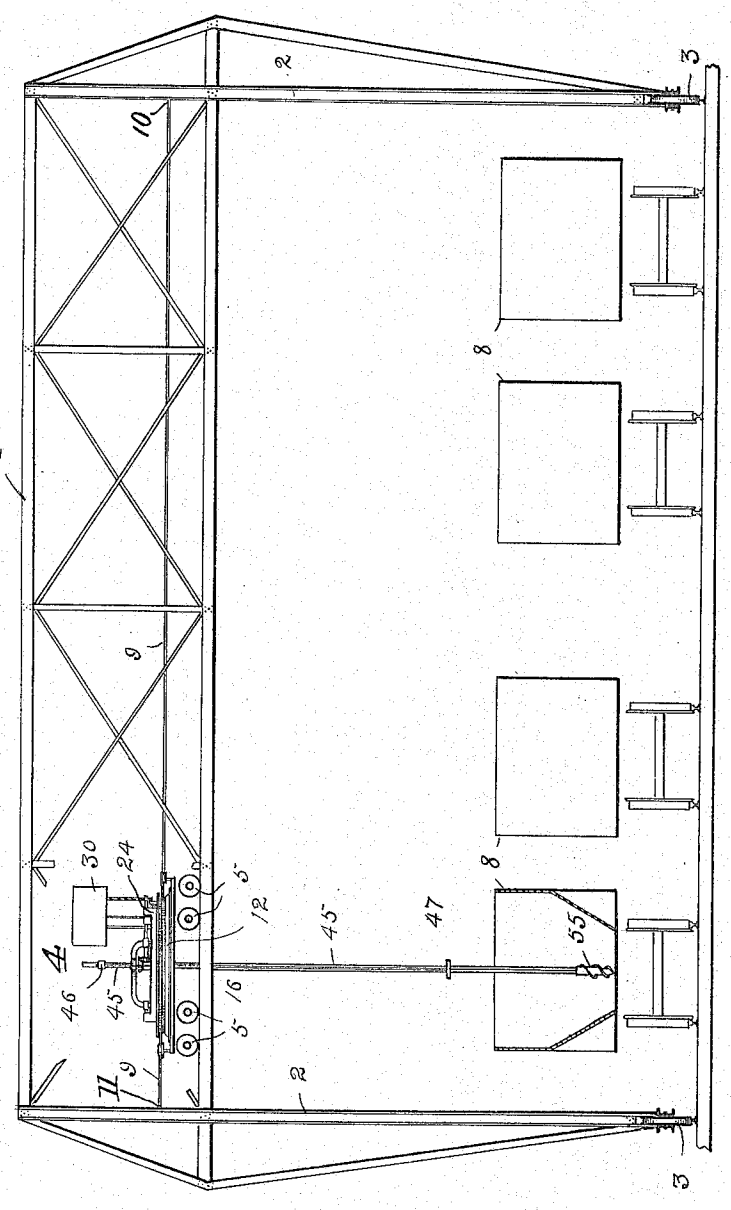
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1,130,007.

Patented Mar. 2, 1915.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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3 SHEETS—SHEET 2.

Fig. 3.

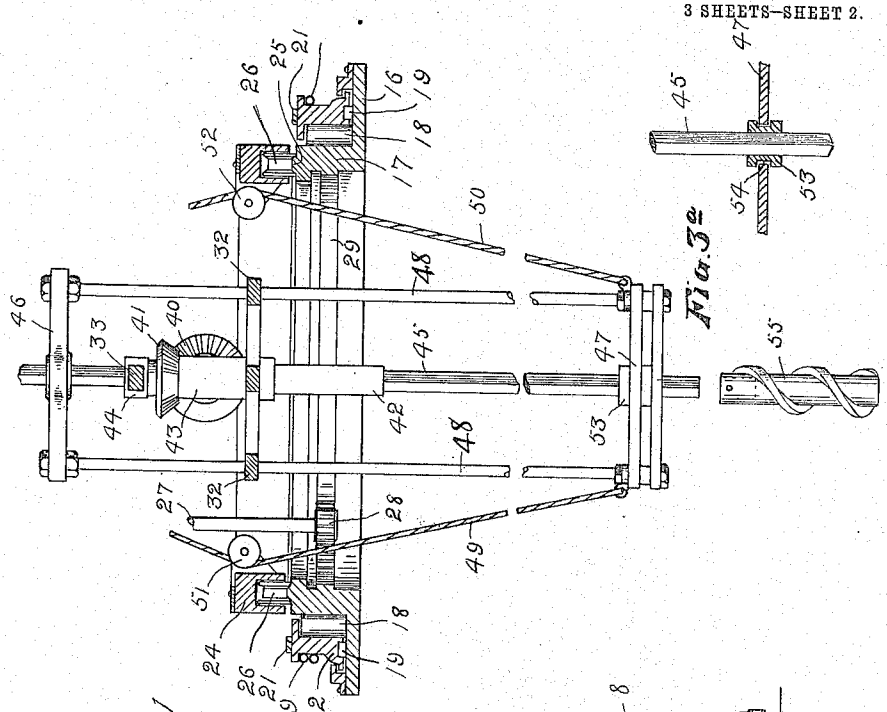
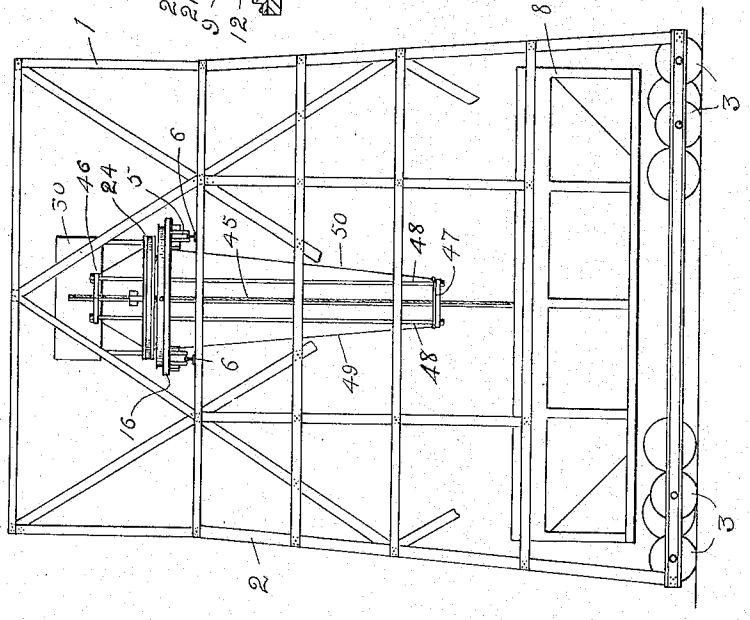


Fig. 3a.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 5.

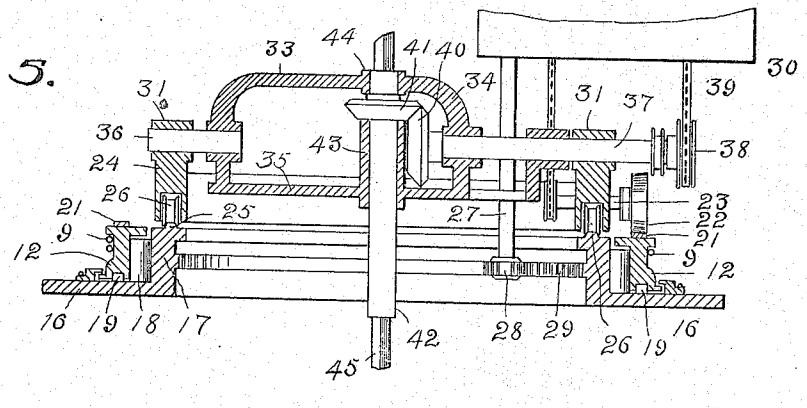
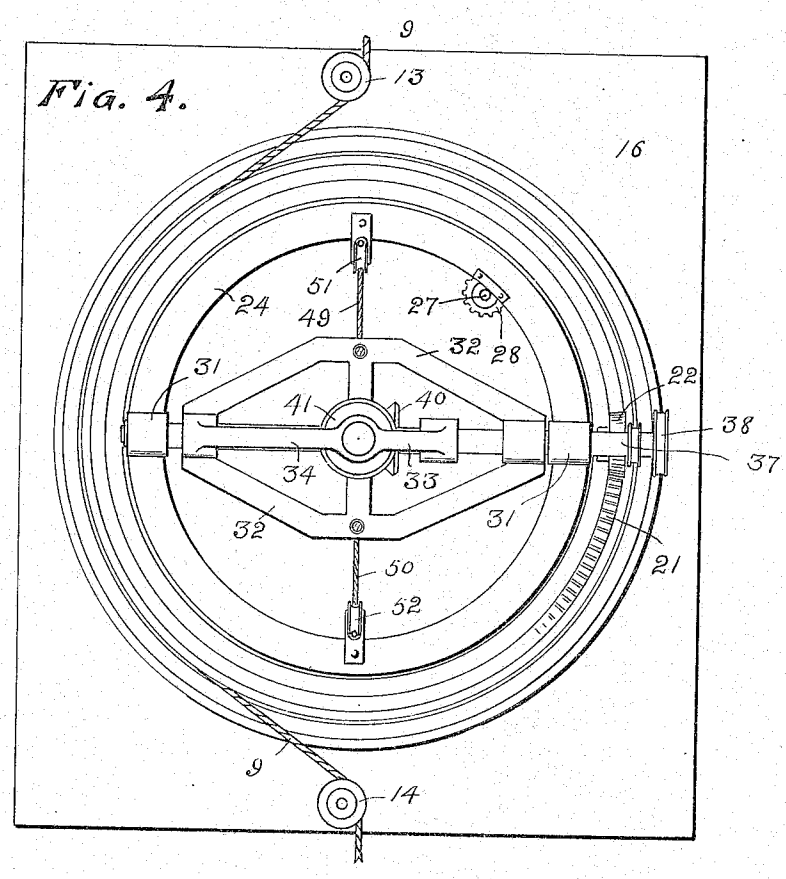


Fig. 4.



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UNITED STATES PATENT OFFICE.

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AGITATOR.

1,130,007. Specification of Letters Patent. Patented Mar. 2, 1915.

Application filed November 3, 1913. Serial No. 798,938.

To all whom it may concern:

Be it known that I, GEORGE ROBERT NAGLE, a citizen of the United States, residing at Superior, in the county of Douglas and State of Wisconsin, have invented certain new and useful Improvements in Agitators, of which the following is a specification.

The present invention relates to improvements in the broad class of agitators, and is particularly applicable to devices for unloading granular material such as coal, ore, etc., from railway cars, docks, and other repositories for this material.

In the handling of granular material such as coal, iron ore and the like from railway cars or docks, difficulty is encountered in the unloading of the same as it is passed from the cars to the docks or from the latter to a second place of discharge, this difficulty being due to the tendency of the material to clog and become packed so that it does not freely discharge of its own gravity from the cars or from the pockets in the docks.

The primary object of this invention is to provide a device by means of which the material can be agitated or stirred up, so that in case of a coal car from which the coal is being dumped, the device is used to agitate the coal as it is fed by gravity toward the mouth of the chute in order that the material may not clog but will pass freely to the mouth of the chute. In the case of unloading ore from cars or from dock pockets in which the ore has been temporarily stored, the latter may be readily stirred and separated so that it will pass freely to and through the openings or exits provided therefor, and thus dispense with the necessity of shoveling and poking by hand which is now the custom.

The invention consists essentially in certain novel combinations and arrangements of parts whereby the agitator which is portable may be moved from one point to another for use, and after being located in proper position, means are provided by which the agitator may be operated to agitate or stir up the material in which it is intended to work, and the invention further consists in certain features as will be hereinafter more fully described and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles of the invention.

Figure 1 is a side elevation of an apparatus involving the present invention, wherein a traveler is shown to operate upon a bridge under which railroad cars are located preparatory to dumping. Fig. 2 is an end elevation of Fig. 1, showing a side elevation of one of the railroad cars. Fig. 3 is an enlarged detail view of the agitator with parts in section. Fig. 3ª is a sectional detail view of the guide plate used in conjunction with the movable agitator bar. Fig. 4 is a plan view of the transporting and oscillating devices for the agitator bar. Fig. 5 is a vertical sectional view of Fig. 4.

In the preferred embodiment of my invention, I have illustrated a portable bridge 1 supported upon the upright end frames 2—2 which are mounted upon suitable wheels 3 whereby the entire bridge may be moved longitudinally the tracks in any desired manner or may be left stationary if preferred.

The bridge and frame-work which are constructed of suitable material and in proper manner are designed to support a traveler which I have indicated as a whole by the numeral 4 in Fig. 1. This traveler or carriage is supported upon wheels 5 that are adapted to run on tracks 6 shown in Fig. 2, and the tracks are supported upon the floor of the bridge 1. This traveler or carriage is adapted to travel from end to end of the bridge 1 so that the agitator indicated as a whole by the numeral 45 may be moved from one point to another so that it can be used in connection with any of the four lines of cars indicated by the numeral 8 in Figs. 1 and 2, which arrangement of cars is that usually found upon ore docks now in common use. To accomplish the movement of the traveler I provide an endless cable or rope 9 which is attached at one end 10 to one end of the bridge 1 and at the other end of the bridge at point 11, and this cable 9 is given a one and one-half turn about the ring or annulus 12 upon the traveler 4. There are two guide sheaves 13 and 14 which are suitably supported from the floor 16 of the traveler, to guide the cable as it leaves and enters the ring 12. The

ring 12 is adapted to revolve horizontally upon the floor 16 of the traveler and surrounds an upwardly projecting annular rim 17 which latter is formed integral with the floor 16 of the traveler. Intermediate the outer wall of the rim 17 and the inner wall of the rim 12 are installed preferably vertically disposed rollers 18 any number of which may be employed and are designed to act as a roller bearing against lateral thrust of the rim 12 when the traveler is in motion. Small rollers 19 may be installed within the floor 16 to form a suitable vertical bearing for the rim 12 and a keeper band 20 may surround the lower projecting base of the rim 12 to hold the latter in position and keep dust and grit from entering the wearing parts of the rim 12 and various rollers. However, it is understood that other forms of support for the rim 12 may be employed without departing from my invention.

An annular rack 21 is formed upon the uppermost face of the rim 12 and which engages a gear wheel 22 mounted upon the shaft 23 journaled within a second annular rim or ring 24 which latter is designed to revolve upon the tracks 25 on the upper wall of the rim 17 and for which purpose it is mounted upon any desired number of suitable rollers 26, thus permitting of the rim 24 being revolubly operative independent of the rims 12 and 17, by means of the vertical shaft 27 revolubly mounted in any convenient manner upon the rim 24 and operating a spur gear 28 which meshes with the annular rack 29 formed upon the innermost wall of the rim 17 whereby the rim 24 may be made to revolve upon the track 25 as is evident, motion being imparted to the upper end of the shaft 27 from the operating power, within the motor cage 30.

The motor cage is supported from the rim 24 and travels with it so that the operator has a clear view of his work at all times. Power may be transmitted in any convenient manner from the motor cage to the radially disposed shaft 23 whereby the gear 22 which engages the rack 21 may be made to revolve at will which when the rim 24 is held against revolution will permit of the rim 24 being revolved, the object of which will appear later.

Diametrically, pivotally mounted within bearings 31 integral with the rim 24 is a frame comprising the members 32—33—34 and 35 one end of which frame is mounted upon a stub shaft 36 and the opposite end upon an elongated shaft 37, which is revolubly operated from its outer end by means of a sprocket 38 and suitable chain 39 leading from the motor cage and having upon its innermost end the beveled gear 40 which meshes with and drives the beveled gear 41 rigidly fixed to the vertical sleeve 42 revolubly mounted within the bearings 43 and 44 within the members 33 and 35 of the pivotal frame.

The agitator stem 45 is preferably square in cross section and is mounted within the elongated sleeve 42 in such a manner as to admit of reciprocal motion therein but confined to the revolving motion of the sleeve 42. The extreme ends of the agitator stem 45 are supported by the cross head 46 at the top and the cross head 47 at the bottom, these latter being united by two brace rods 48—48 upon either side of the stem, extending the full length thereof and slidably passing through the members 32 of the pivotal frame, in such a manner as to permit of the entire agitator and its attachments being readily raised or lowered. To accomplish this raising and lowering of the agitator and also to produce an oscillating motion of same when desired, I provide the stay lines 49 and 50 attached to either end of the cross head 47 and leading through to sheaves 51 and 52 mounted upon the rim 24 to any suitable mechanism, not shown, within the motor cage, and arranged in such a manner as to be operated in either direction simultaneously, or individually, thus permitting of the agitator being moved up or down or swung to any angle desired, as is evident, it being mounted within the pivotally suspended frame and the rim carrying the frame being susceptible to revolving motion and this entirely independent of any desired revolving motion of the agitator.

The cross head 47 is provided with a thimble 53 which has a square opening through its center for the reception of the stem #45, and is formed externally with an annular groove 54 which engages the edges of the opening in the cross head 47 so that the thimble will revolve with the stem within the cross head.

An externally screw threaded bit 55 is illustrated in the drawing as being removably attachable to the extreme lower end of the stem 45 and forms the agitator proper, for disengaging the lodged ore or coal within the receptacle over which the device may be working, and it is evident that many other forms of agitating bit or brush might be made use of.

In the operation of the apparatus the traveler is brought to the desired position with relation to the bridge 1 by operating the revolving rim 12 until the traveler is brought directly over the car which is being unloaded. The agitator bar 45 is now rotated through the described mechanism and is lowered into the car in position to stir up or agitate the coal in the car. By means of the cables 49 and 50 the vertical position of the agitator bar is determined, and may also be oscillated upon its pivotal support to any desired angle. In this manner move-

ments may be imparted to the agitator bar as follows: First, the traveler may be caused to travel from right to left in Fig. 1 over the car, the agitator bar may be raised, lowered and oscillated by means of the cables 49 and 50 and pivotal support. Thus providing wide range of adjustment of the bar and insuring its reaching to any and all points of the car that is being unloaded, so that the contents may be continually stirred up or agitated and prevented from clogging, and made to pass freely through the discharge opening in the bottom of the car. It will be understood that the agitator bar is applicable for use in dock pockets and other similar receptacles, and it is applicable for use in many other different ways not herein illustrated. Its utilization provides for great saving in labor and time, and obviates one of the objectional features of hammering on the side of the metallic railway car to dislodge the clogged material inside the car.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with a traveler, of a rotary ring having rollers, a supporting bracket on the traveler for said rollers, rack teeth on the ring, and a rack wheel engaging said teeth, means for rotating said rack wheel, and a cable having both its ends anchored and frictionally engaging and passed around said rotary ring.

2. The combination in an apparatus as described with the supporting bridge, of a traveler thereon and traversing mechanism therefor, a revoluble ring mounted on the traveler and means for revolving said ring, an oscillatable and revoluble agitator bar suspended from and within said ring and means for oscillating and revolving said bar.

3. The combination in an apparatus as described with the supporting bridge, of a traveler thereon and traversing mechanism therefor, a revoluble ring mounted on the traveler and means for revolving said ring, a frame having a pivot end supported on said ring and formed with a hub, an agitator member revoluble in said hub, and means for revolving said member.

4. The combination in an apparatus as described with a revoluble ring, of a frame having a pivot end supported on said ring and formed with a hub, an agitator bar revoluble in said hub, bearings on the frame and a shaft supported in said bearings and ring, means for rotating said shaft to revolve the bar, and said pivoted frame and shaft forming an oscillatable support for the bar.

5. The combination in an apparatus as described with a supporting ring of a frame pivoted on said ring and having a hub central of the ring, a shaft journaled in the frame and ring and supporting the frame so that it may oscillate, an agitator bar supported in the hub, means on the shaft and bar for revolving the bar, and means for raising or lowering said bar.

6. The combination with a revoluble ring of a frame pivoted on said ring and having a hub central of the ring, a shaft journaled in the frame and ring and supporting the frame so that it may oscillate, an agitator member supported in the hub, means on the shaft and said member for revolving the member, and means for raising or lowering said member.

7. The combination with a bridge, traveler and a revoluble ring on the traveler, of an oscillatable frame supported on said ring, comprising a hub, a stub shaft and a driven shaft, an agitator bar supported in said hub, operating connections between said shaft and bar for revolving the latter, and means for raising or lowering the agitator bar.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE ROBERT NAGLE.

Witnesses:

JOHN BRENNAN,

H. FORSLUND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."