R. S. RICHARDS.

CHARGING DEVICE.

APPLICATION FILED DEC. 18, 1917. RENEWED APR. 22, 1921.

1,398,649.

Patented Nov. 29, 1921.

3 SHEETS—SHEET 1.

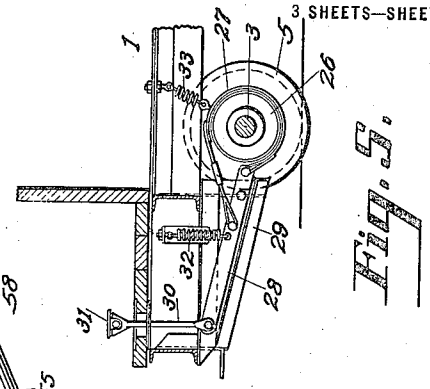


Fig. 3.

Fig. 1.

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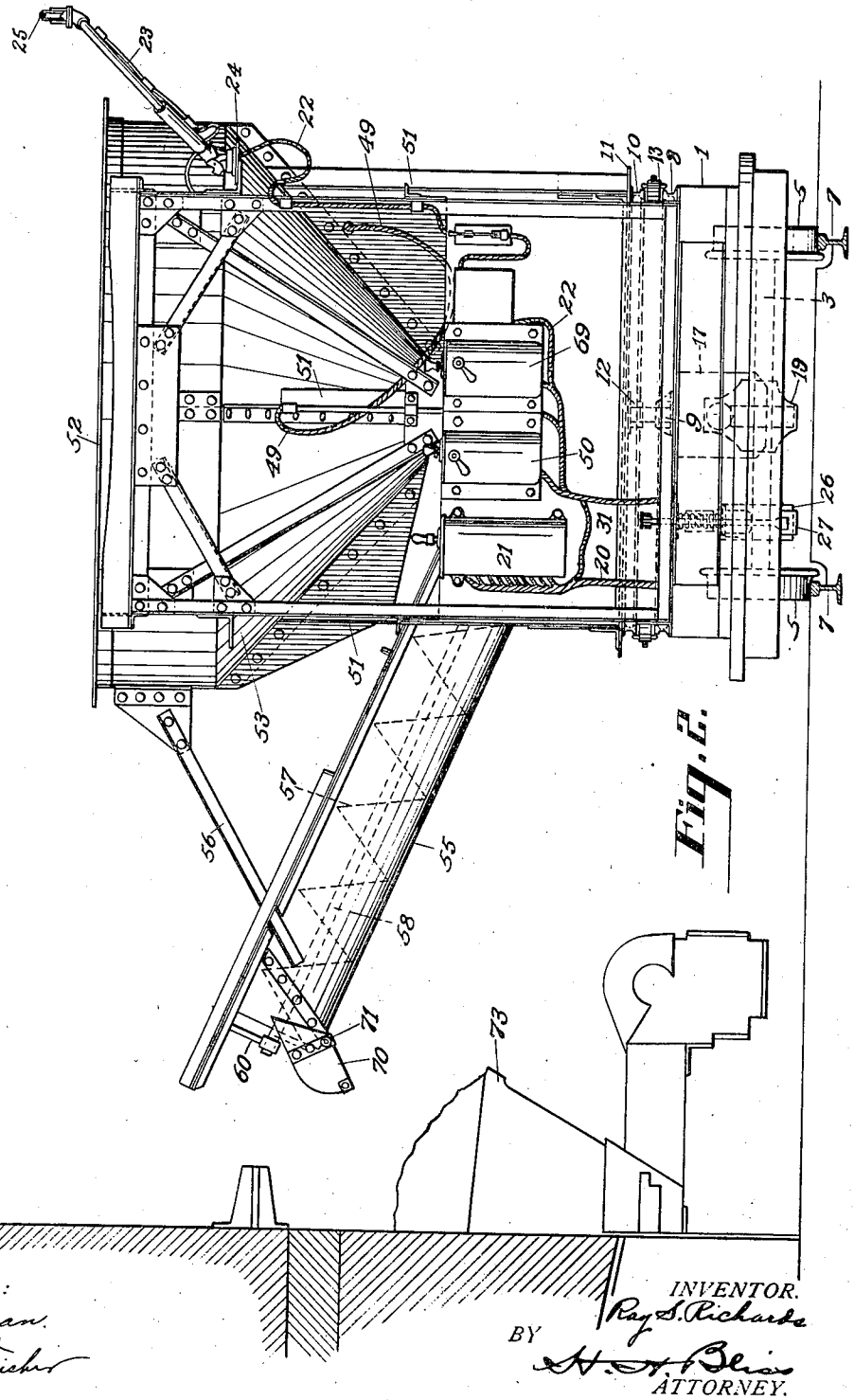


Fig. 2.

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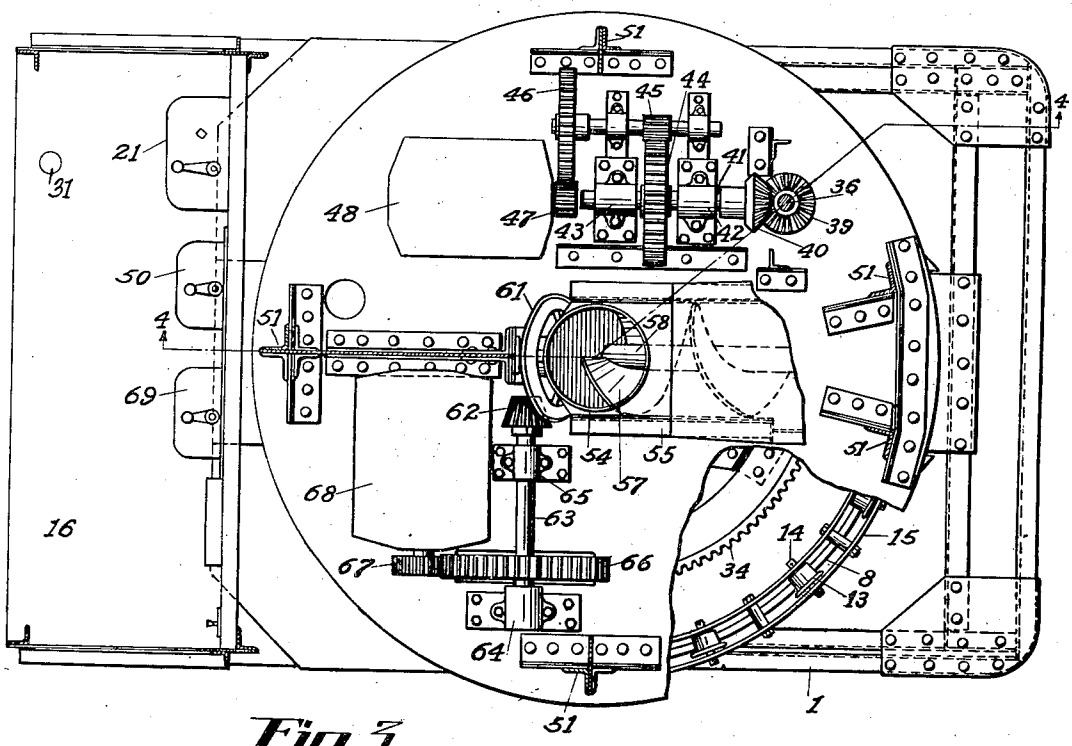


Fig. 3.

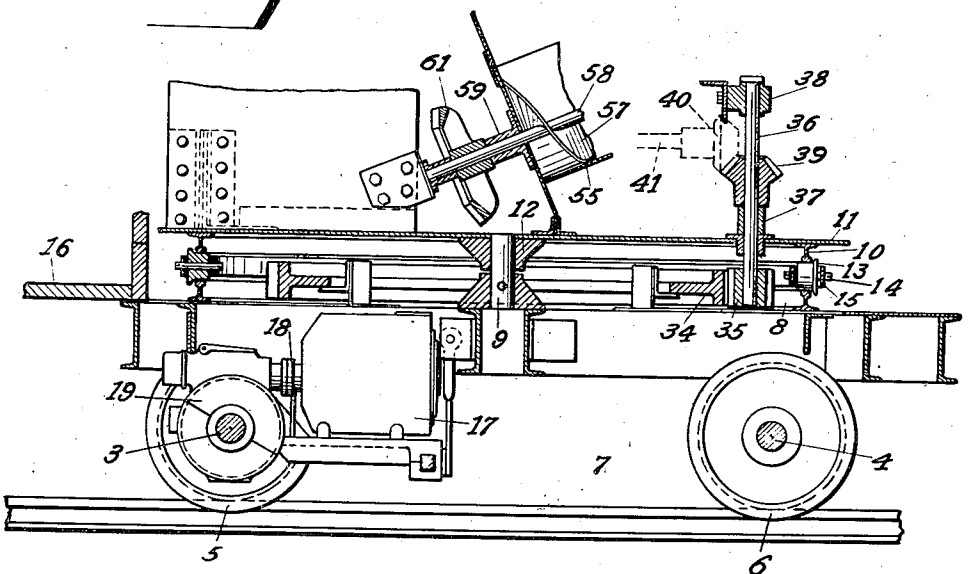


Fig. 4.

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UNITED STATES PATENT OFFICE.

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CHARGING DEVICE.

1,398,649. Specification of Letters Patent. Patented Nov. 29, 1921.

Application filed December 18, 1917, Serial No. 207,734. Renewed April 22, 1921. Serial No. 463,575.

To all whom it may concern:

Be it known that I, RAY S. RICHARDS, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Charging Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

The present invention relates to certain new and useful improvements in charging devices adapted to receive predetermined amounts of material from a conveniently arranged source of supply and to deliver said material to points where it may be required for use.

The especial object is to provide a convenient and economical charging device adapted to travel upon suitably arranged tracks, to receive charges of fuel from a conveniently arranged source of supply and deliver said fuel to the hoppers of the mechanical stokers associated with the steam boilers of power plants or with other similar furnaces.

The devices by which I attain this object are set forth in the following specification and illustrated in the accompanying drawings of which—

Figure 1 is a side elevation of the preferred embodiment of my invention.

Fig. 2 is an end elevation of the machine illustrated in Fig. 1 showing the relation of the delivery apparatus to the mechanical stokers associated with a steam boiler.

Fig. 3 is a plan view of the machine having certain parts removed to disclose other parts.

Fig. 4 is a fragmentary sectional view taken along the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary detail of the brake mechanism by which movements of the machine along the track are controlled.

Like numerals refer to similar parts in the several figures.

Referring to the drawings the numeral 1 indicates a truck frame upon which the apparatus is supported. To the frame 1 is attached the journal boxes 2 in which are journaled the supporting axles 3 and 4, having traction wheels 5 and 6 adapted to travel along the rails 7 of a suitably positioned track. Upon the upper side of the truck frame 1 is mounted a circular track rail 8 concentric with an upstanding pivot pin 9 which is also attached to the truck frame 1. Positioned above the track rail 8 and concentric therewith is a similar track rail 10 fixed to the underside of a turn table plate 11. At the center of the turn table plate 11 is fixed a pivot bearing 12 which engages the pivot pin 9 to prevent lateral displacement of the turn table. Flanged rollers 13 positioned between the rails 8 and 10 support the weight of the turn table 11 and the parts carried thereby. The rollers 13 are journaled upon pins 14 carried by a pair of concentric rings 15 to maintain the working relation of said rollers with the track rails 8 and 10. At one end the truck frame 1 is projected beyond the turn table 11 and upon this projecting end is built a cab 16 for the protection of the operator and of the controlling devices by the manipulation of which movements of the machine are regulated. Suspended beneath the truck frame 1, in a manner common in electric traction practice, is an electric motor 17 the armature shaft of which is connected through a coupling 18 with suitable gearing contained within the gear case 19 to rotate the axle 3 to propel the truck along the track rails 7. As the specific arrangement of gearing by which the motor is connected with the axle forms no part in the present invention further description is not thought to be necessary at this time.

The motor 17 is connected through suitable electric conductors contained within the flexible cable 20 with a controller 21 mounted in the cab 16 convenient to the hand of the operator. Suitable conductor cables 22 are arranged to connect the controller 21 with a trolley pole 23, mounted upon a convenient bracket 24 of the cab, and arranged to contact with a conveniently arranged trolley wire 25 through which power is derived to actuate the motor 17. Fixed to the axle 3 intermediate the wheels 5 is a brake drum 26 which is encircled by a brake band 27 connected to a brake lever 28. The brake lever 28 is pivotally supported upon a member 29 of the truck frame and is connected, at its outer end, with a pedal rod 30 extending upwardly through the floor of the cab and terminating in a pedal 31 conveniently positioned to be pressed by the foot of the operator to cause the brake band 27 to grip the brake drum 26 and thereby retard movement of the

truck along the track. A suitable suspension spring 32 is provided to rotate the brake lever 28 to the brake releasing position and a similar spring 33 is provided to carry the weight of the brake band to prevent its dragging upon the drum to cause unnecessary friction.

Mounted upon the truck frame 1 concentric with the pivot pin 9 is a circular rack 34 which is engaged by a spur pinion 35 fixed to the lower end of a vertical shaft 36. The shaft 36 extends upwardly through an apereture of the turn table plate 11 and is supported in suitable journal bearings 37 and 38. Fixed to the shaft 36, between the bearings 37 and 38, is a miter gear 39 engaged by a similar gear 40 attached to a horizontal shaft 41 journaled in bearings 42 and 43 mounted upon the turn table. The shaft 41 is connected through a train of gears 44, 45, 46 and 47 with an electric motor 48 mounted upon the turn table 11. By the actuation of the motor 48 the pinion 35 is rotated, causing it to travel around the rack 34 and thereby to cause the turn table 11 to rotate about the pivot pin 9. The motor 48 is connected, through suitable electric conductors contained within the flexible cable 49, with a controller 50 positioned in the cab convenient to the hand of the operator.

Rising from the turn table 11 are upright stanchions 51 upon which is supported a tank 52 having a conical bottom 53 the axis of which coincides with the axis of the turn table 11. A short spout 54 connects the apex of the cone 53 with an upwardly inclined elongated trough 55 the outer end of which projects beyond the lines of the truck frame and is supported by suitable suspension members 56 from the side of the tank 52. Within the trough 55 is mounted a screw conveyer 57 the shaft 58 of which is supported in journal bearings 59 and 60 in the manner common in screw conveyer practice. Fixed to the projecting lower end of the shaft 58 is a bevel gear 61 which is engaged by a bevel pinion 62 mounted upon a horizontal shaft 63 supported in journal bearings 64 and 65 of the turn table. The shaft 63 is connected through the spur gears 66 and 67 with a motor 68, mounted upon the turn table, by which the screw conveyer may be actuated. The motor 68 is connected through suitable electric conductors contained within the flexible cable 49, with a suitable controller 69 positioned in the cab convenient to the hand of the operator. At the upper end of the trough 55 is a valve plate 70 hinged upon a transverse horizontal pivot 71, and to this plate is connected the counterweight 72 which tends to hold said valve plate in its upper position. When the motor 68 is actuated to revolve the screw conveyer 57 coal is drawn through the spout 54 from the conical hopper 53 and discharged upon the valve plate 70. The weight of the coal upon the plate 70 overcomes the counterweight 72 and tips the valve plate downward to serve as a chute over which the discharged material may flow. As soon as the flow of material ceases through the trough 55, either by reason of the stopping of the conveyer or of the exhaustion of the supply in the hopper, the counterweight 72 will restore the valve plate to its upper position and prevent dribbling of material from the end of the trough while the machine is in transit.

Heretofore the provision for fuel supply in power houses having automatic stoker equipment has commonly comprised coal bunkers supported above the boilers and spouts arranged to conduct the coal directly from said bunkers to the stoker hoppers. This arrangement has proven objectionable because of the necessity for heavy columns to support the bunkers. These columns are commonly contained within the boiler and furnace walls, and it not infrequently happens that a defective wall will permit the heat of the furnace to seriously injure a column, thereby endangering the stability of the bunker. The presence of such columns in the boiler walls necessitates greater space between adjacent boilers, and frequently seriously interferes with repairs and renewals. To obviate these difficulties storage bunkers have been arranged outside the boiler house and a track laid upon the floor in front of the boilers along which fuel may be transported in suitable vehicles. Boilers are commonly arranged on both sides of such a track and my improved charging device may be operated upon such a track to serve the stokers at either side.

In the operation of such a plant the charging truck is first moved into position beneath the storage tank, or to some other suitable source of supply where the tank 52 may be conveniently filled. By the manipulation of the controller 21 the motor 17 may be actuated to propel the machine to positions in front of the furnaces which are to be charged, and by pressure of the foot of the operator upon the brake pedal 31 the rotation of the driving wheels may be so retarded as to accurately stop the machine in front of the desired stoker. During transit the discharging conveyer 55 commonly occupies a position in the central plane of the track, and upon arrival at the stoker which is to be charged the controller 50 may be manipulated to actuate the motor 48 in a direction to so rotate the turn table 11 that the discharge chute will be brought into position above the hopper 73 of the stoker. The controller 69 may then be manipulated to actuate the motor 68 to drive the screw conveyer 57 to draw the coal from the tank 52 and dis-

charge it over the chute 70 into the hopper 73. After the stoker hopper is fully charged, or the supply of coal in the tank 52 exhausted, the controller 69 will be again manipulated to stop the screw conveyer, the controller 50 manipulated to return the conveyer trough to the traveling position, and the controller 21 manipulated to return the truck to the loading position, or to such other place as may be desired. As soon as the coal ceases to flow over the chute 70 the counterweight 72 restores said chute to its upper position and prevents the dribbling of coal from the trough, materially contributing to the general tidiness of the boiler room.

What I claim is—

1. In a charging device, the combination with a wheeled truck, of a tank mounted upon the truck, a trough beneath the tank adapted to swing to either side of the truck to deliver material from the tank, a chute hinged to the delivery end of the trough, and a counterweight connected to the chute to cause it to close the end of the trough when the flow of material therethrough becomes less than a predetermined rate.

2. In a charging device, the combination with a wheeled truck, of a tank mounted upon the truck, a trough beneath the tank adapted to swing to either side of the truck to deliver material from the tank, and a chute hinged to the delivery end of the trough and so balanced as to automatically close the end of the trough when the flow of material therethrough becomes less than a predetermined rate.

3. In a device of the class described, the combination with a source of supply, of a trough adapted to deliver material from said source, and a chute hinged to and adapted to automatically close the end of the trough when the flow of material therethrough becomes less than a predetermined rate.

4. In a charging device, the combination with a locomotive truck, of a tank mounted upon the truck for rotation about a vertical axis, a conveyer beneath the tank rotatable therewith to either side of the truck to deliver material from the tank, and an automatic valve arranged to close the end of the conveyer trough when the flow of material therethrough becomes less than a predetermined rate.

5. In a device of the class described, the combination with a source of supply, of a trough adapted to deliver material from said source, a chute hinged to the delivery end of said trough, and a counterweight connected with the chute to cause it to close the end of the trough when the flow of material therethrough becomes less than a predetermined rate.

6. In a device of the class described, the combination with a source of supply, of a trough adapted to deliver material from said source, and an automatic valve adapted to close the end of the trough when the flow of material therethrough becomes less than a predetermined rate.

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

RAY S. RICHARDS.

Witnesses:
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