May 15, 1962 A. E. PYKE 3,034,236

SNOW CLEARING APPARATUS FOR RAILROAD SWITCHYARDS

Filed April 1, 1960

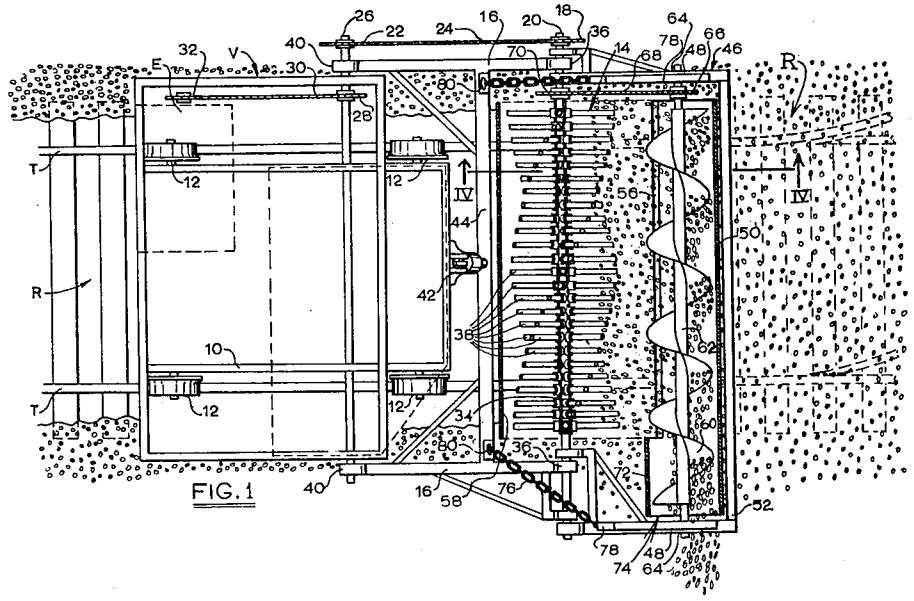


FIG. 1

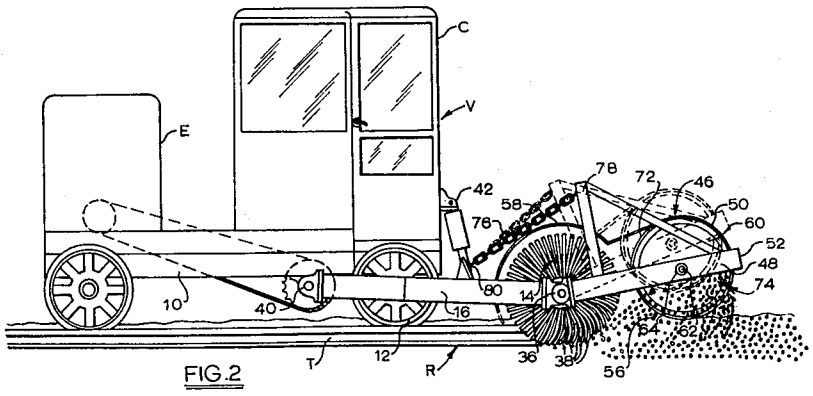


FIG. 2

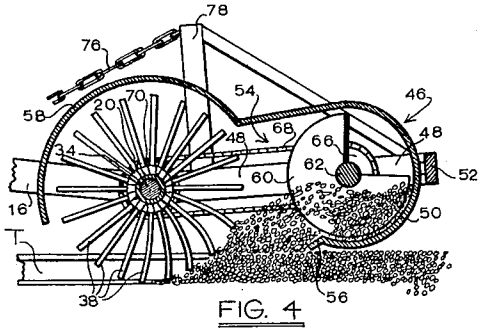


FIG. 4

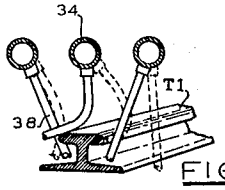


FIG. 3

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United States Patent Office 3,034,236
Patented May 15, 1962



3,034,236

# SNOW CLEARING APPARATUS FOR RAILROAD SWITCHYARDS

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Filed Apr. 1, 1960, Ser. No. 19,254
5 Claims. (Cl. 37—25)

The invention relates to apparatus for clearing snow from relatively complex sections of railroad track, for example, cros-overs, switch points and the like. Under severe weather conditions such complex portions of track require more or less constant maintenance to prevent them from becoming clogged with snow or ice, rendering the same more or less inoperative.

Such snow clearing apparatus as has been available heretofore is, generally speaking, adequate for clearing relatively deep snow, and also for clearing straight or so-called "tangent" track. Conversely, however, such equipment has not always been capable of clearing the more complex sections of track, as for example, are met with in railway switchyards, and indeed in many cases, such operations have been performed by manual labour.

Many of the difficulties associated with this particular problem arise from the relative complexity of the track, and the vital necessity for clearing snow and ice from the various recesses and crevices formed thereby in order to free the same for movement.

Accordingly, it is a general objective of the invention to provide snow clearing apparatus adapted for clearing snow out of recesses or crevices or the like in an expedient and efficient manner, and which is both economical to make and relatively simple and economical to operate. More specifically, it is an object of the invention to provide such apparatus which is adapted for mounting on a vehicle.

Still more specifically, it is an object of the invention to provide apparatus having the aforementioned advantages in which the snow clearing apparatus is operable to pick up the snow lying on the road bed travelled by such vehicle and to throw it forwardly of the vehicle and to clear such thrown snow to one side of the road bed.

It is a further object of the invention to provide such apparatus which is particularly adapted and suitable for operation in railway switch yards and the like.

The invention seeks to provide the foregoing and other advantages which will appear from the following description of the preferred embodiment of the invention by the provision of snow clearing apparatus for use on a vehicle, consisting basically of a sweeping element for throwing snow forwardly of such vehicle, and a disposal device for receiving such snow and disposing of it to one side of the vehicle.

A preferred embodiment of the invention will now be described with reference to the following drawings, in which like reference devices refer to like parts of the apparatus throughout the various views and diagrams, and in which,

FIG. 1 is a diagrammatic plan view partly in section showing a snow clearing vehicle, fitted with the snow clearing apparatus according to the invention,

FIG. 2 is a sectional side elevation of the snow clearing apparatus shown in FIGURE 1, showing part of the vehicle to which it is attached, for clarity,

FIG. 3 is a schematic diagram of a detail of the sweeping element of the instant snow clearing apparatus showing the same in three successive positions during operation, and

FIG. 4 is an enlarged section of the snow clearing apparatus in isolation along the line IV—IV of FIGURE 1.

Before describing the snow clearing apparatus of this



preferred embodiment, a brief description will be given of the snow clearing vehicle, although it will be appreciated, that the invention is not to be considered as limited to use in conjunction with this particular vehicle which is here described for illustrative purposes only.

Accordingly, from FIGURES 1 and 2, it will be seen that the snow clearing vehicle V consists of a frame 10 mounted on wheels 12, adapting the same for use on railroad tracks T, motive power being supplied thereto by an engine and drive mechanism (not shown) driving wheels 12 in known manner. Such vehicle V may also be provided with a cab C at the forward end thereof, and may optionally be provided with further conventional accessories, for example, sand boxes (not shown) may be provided adjacent wheels 12 for use in the elimination of slipping or skidding in bad weather.

Dealing now with the snow clearing apparatus of this preferred embodiment of the invention, it will be seen that this is comprised of the sweeping element 14 supported for rotation by arms 16 and 16 and driven by sprocket 18, keyed to shaft 20 thereof, which is, in turn, connected to sprocket 22 by means of chain 24, sprocket 22 in turn being driven by shaft 26, sprocket 28, chain 30 and sprocket 32 connecting the same to engine E situated towards the rear of vehicle V.

Sweeping element 14 will be seen to consist of the drum 34 mounted on shaft 20, journalled at 36—36 in arms 16 as aforesaid. In order to beat and break up and dislodge snow and ice which may have become compacted, and to reach into recesses or crevices, flails 38 are individually attached to drum 34, and extend therefrom more or less radially in four equally spaced columns. It will be seen that flails 38 are spaced apart from one another in any one column, and that each said flail 38 in any one column is offset relative to its neighbour in that column by more or less equal angles. It is noteworthy that flails 38 are of relatively substantial length and weight so as to be able to strike the snow and ice with sufficient force to shatter and dislodge it, and to be able to throw it forwardly of the machine. However, it is important that flails 38 should be relatively flexible, at least for part of their length, so as to be able to pass over or around the railroad tracks T themselves, and other components making up the complete road bed R (see FIGURE 3) with a whip-like cleaning motion and without substantially damaging any part thereof, or themselves, though obviously more or less wear will occur in use. However, any such wear, or even breakage, of flails 38 can be easily repaired, flails 38 being readily detachable from drum 34 individually, for replacement.

In order to adjust the height of sweeping element 14 in relation to the road bed R or other surface which is being cleared by the instant apparatus, arms 16 are swingably attached to frame 10 of vehicle V at journals 40, rendering sweeping element 14 swingable between upper and lower positions. Any suitable means may be provided for raising and lowering sweeping element 14 for example, the hydraulic lift 42 swingably attached to frame 10 and to cross bar 44 extending between arms 16.

In order to lock sweeping element 14 at any desired elevation, a hydraulic lock (not shown) may be associated with hydraulic lift 42 for the purpose, in known manner.

In order to receive and to dispose of snow and ice thrown forwardly and upwardly by sweeping element 14 disposal device 46 is provided, located forwardly of sweeping element 14 in receiving relation thereto and supported in such location by bars 48.

Disposal device 46 will be seen to consist of a catcher 50 of rather more than semi-circular section extending the full width of sweeping element 14 and fastened to bars

48, and to bumper 52 provided therebetween forwardly of catcher 50. The open side of catcher 50 provides an open mouth 54, the lower edge of which is defined by lip 56 extending therealong, and which is oriented to receive snow and ice thrown forwardly and upwardly by flails 38. Catcher 50 is extended rearwardly over sweeping element 14 providing a hood 58 enclosing the same for about one-third of its circumference and preventing the escape of extraneous matter upwardly therefrom. In order to dispose of snow and ice received by catcher 50 from sweeping element 14, a rotary screw conveyor 60 is provided within catcher 50 for pushing said snow and ice axially therealong, being mounted on spindle 62 running in journals 64 on bars 48, and driven by sprocket 66, chain 68 and sprocket 70 fastened to shaft 20.

In order to carry the snow and ice received by catcher 50 well clear of the road bed R which is being cleared, catcher 50 is provided with a cylindrical extension forming a spout 72 extending beyond the width of sweeping element 14, and it will be seen that conveyor 60 in fact extends into spout 72 for pushing said snow from catcher 50 and into spout 72 with sufficient force to eject the same therefrom through opening 74.

In order to adjust the height of disposal device 46 in relation to sweeping element 14, bars 48 are mounted for swinging about shaft 20 of sweeping element 14, and may be adjustably fixed in any desired position by suitable adjustment of chains 76 fastened to upright posts 78 located on bars 48 and extending therefrom to slotted holes 80 in cross bar 44.

In operation vehicle V may be set in motion, which, generally speaking, will be relatively slow, though obviously depending upon the particular circumstances of operation. At the same time sweeping element 14 may also be set in motion, its direction of rotation being counter to the direction of motion of vehicle V, and by operation of hydraulic lift 42 its height may be set so that flails 38 are just contacting the road bed R along which vehicle V is travelling, though preferably such contact should only occur at the tips of flails 38 in order to avoid wear on these members, and also loss of power. Rotation of sweeping element 14 will also cause rotation of spiral pusher or conveyor 60 located in snow disposal device 46, through sprocket 70, chain 68 and sprocket 66.

As sweeping element 14 rotates, flails 38 will apply continuous blows to snow and ice located on the road bed breaking up and dislodging the same and will thereafter throw the same forwardly of vehicle V and into the mouth 54 of catcher 50. It is here noteworthy that, by operation of sweeping element 14 in a direction counter to the direction of movement of vehicle V flails 38 are caused to strike the snow and ice on road bed R in a generally forward and upward direction causing the same to be thrown or impelled forwardly of the vehicle V. By adopting this mode of operation, it will be seen, that any snow or ice which does not reach catcher 50 and falls onto the road bed R once more will still be in front of sweeping element 14, and will be brushed or swept thereby continually until the same is held by catcher 50. Under certain operating conditions, this particular feature of the apparatus has caused a wall of snow to build up between lip 56 of catcher 50 and the snow lying on the road bed R in the path of sweeping element 14, thereby preventing the escape of snow forwardly of catcher 50 and guiding the same into the open mouth 54 thereof. While operating in this manner flails 38 may in fact be deflected to a greater or lesser extent by contact with the snow or ice, more or less in the manner indicated in FIG. 2 thereby applying substantial blows thereto on impact and thereafter applying a brushing action upwardly and forwardly of vehicle V in the direction of disposal device 46.

When a complex section of track is encountered, and, as stated, it is on such complex sections that the present invention finds its primary application, individual flails 38 may be still further deflected as they contact parts of the



track T1, for example, but such deflection will be only momentary and will not substantially inhibit the scavenging action of flails 38 on either side thereof as is shown in FIGURE 3. It will be understood that track T1, in this illustration is oblique to the axis of rotation of drum 34 and shaft 20, running diagonally across the path of vehicle V, and forms crevices or declivities at the intersection thereof with the tracks T upon which vehicle V is running. By this action aforesaid, flails 38 are thus enabled to reach into such crevices and clear the snow and ice therefrom, freeing such section of track for switching for example.

Once in catcher 50 snow and ice is pushed axially therealong towards spout 72 by the rotation of spiral conveyor 60, being finally ejected through opening 74 in spout 72 alongside the road bed R, and at some distance therefrom. It is to be observed that in order to avoid blockages occurring in disposal device 46 spiral conveyor 60 should be so designed and driven as to operate at only about half capacity, that is to say, with snow extending therearound for only approximately 180° thereof.

Where desirable, disposal device 46 may be relocated with respect to sweeping element 14 by merely raising both sweeping element 14 and disposal device 46, by operation of hydraulic lift 42, placing blocks (not shown) under disposal device 46 and lowering sweeping element 14 once more, after which chains 76 may be either shortened or lengthened and refastened in slotted holes 80. The positioning of the instant snow clearing equipment ahead of vehicle V and of all track engaging means, such as wheels 12, as illustrated throughout the drawing is not only to facilitate its adjustability as aforesaid but especially also to enhance its efficiency in use on the short complex track sections found in the railroad switchyards for which it was designed as well as in many other and more obvious respects.

The foregoing description of a preferred embodiment of the invention is here made by way of example only, and it is not thought that the invention is limited to the specific construction illustrated other than as specified in the appended claims which are intended to include all modifications which do not depart from the spirit of the invention.

What I claim as my invention is:

1. Apparatus for clearing snow from the roadbed and about the rails of complex railroad track having switches and other complex sections comprising a vehicle; having track engaging means on which it is transportable along said track in at least one forward direction; an elongated sweeping element; structure projecting forwardly from said vehicle overhanging said track and supporting said sweeping element substantially over and transversely of said railroad track in front of said vehicle and of said track engaging means; means for operating said sweeping element to dislodge said snow and to throw it forwardly and upwardly, and a disposal device located above said rails to catch snow thrown by said sweeping element and to deposit it along and at one side, at least, of said railroad track said sweeping element being composed, in part, of flexible flails arranged in at least one row dimensioned and disposed to reach each said rail and each side of each said rail of said complex track sections and the road bed therebetween when the sweeping element is operated as aforesaid, without interference from said complex track sections.

2. The apparatus set forth in claim 1 including means for adjusting the height of said sweeping element relative to said road bed and track.

3. The apparatus set forth in claim 1 wherein said sweeping element includes a drum rotatably mounted in a substantially horizontal plane; the said flails being attached thereto and spaced apart from one another, and extending radially therefrom in equidistant columns.

4. The apparatus set forth in claim 1 including a catcher forming part of said disposal device and a pusher

operable within said catcher to propel said snow axially therealong towards and out of one end thereof.

5. The apparatus set forth in claim 1 including means for adjusting the height of said disposed device in relation to said sweeping element.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 739,387 | Cailyer | Sept. 22, 1903 |
| 1,200,234 | Purdin | Oct. 3, 1916 |
| 1,255,275 | Barnett et al. | Feb. 5, 1918 |
| 1,266,930 | Farquhar | May 21, 1918 |
| 1,638,708 | Saxon | Aug. 9, 1927 |
| 2,727,263 | Dangremond et al. | Dec. 20, 1955 |
| 2,777,220 | Bates | Jan. 15, 1957 |
| 2,869,159 | Kershaw | Jan. 20, 1959 |
| 2,929,084 | Kershaw | Mar. 22, 1960 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 2,732 | Austria | Nov. 26, 1900 |

# UNITED STATES PATENT OFFICE

# CERTIFICATE OF CORRECTION

Patent No. 3,034,236 May 15, 1962

Albert Edward Pyke

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 47, after "vehicle" strike out the semi-colon; line 59, after "track" insert a semi-colon; column 5, line 4, for "disposed" read -- disposal --.

Signed and sealed this 11th day of September 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents