

J. SMITH & F. N. LOVEJOY.
 TRACK LAYER FOR STEAM SHOVELS.
 APPLICATION FILED APR. 28, 1911.

1,001,317.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 1.

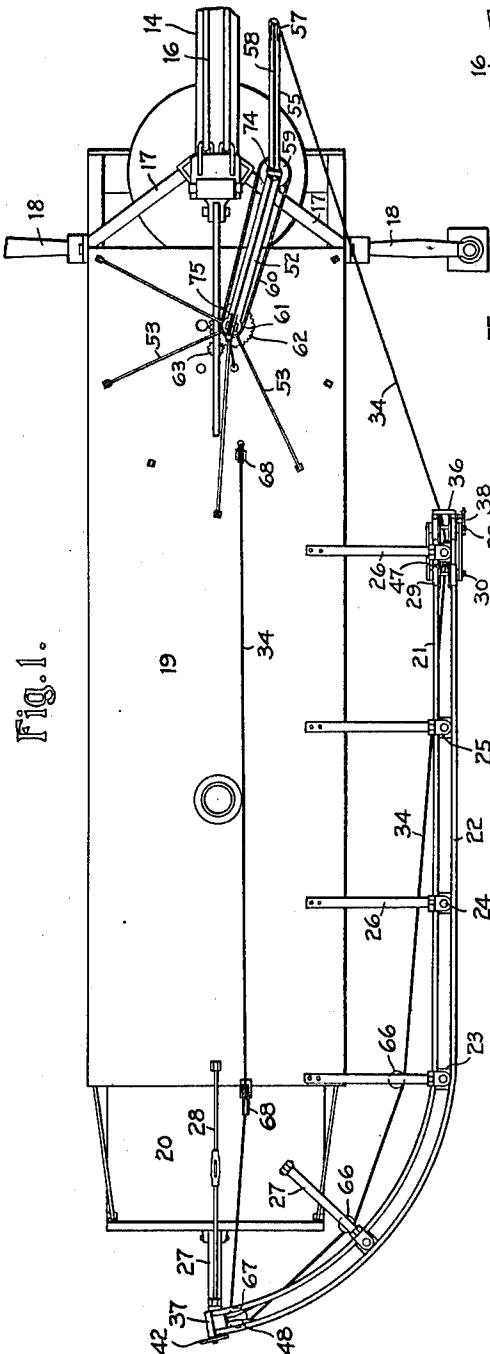


Fig. 1.

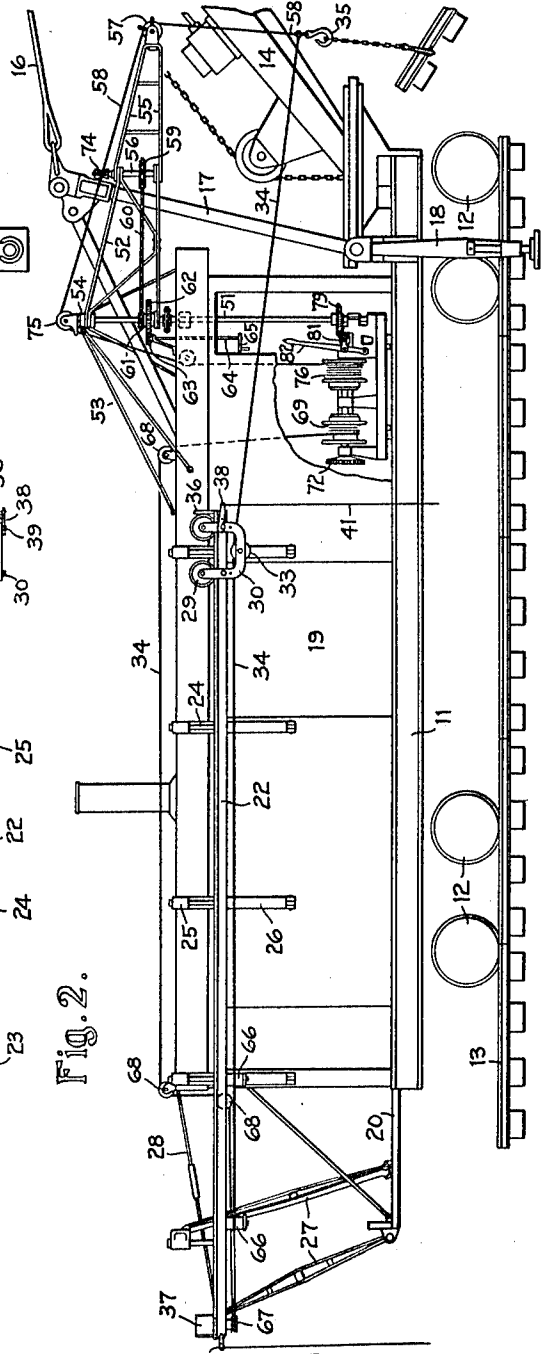


Fig. 2.

Witnesses:
 Clarence W. Carroll
 L. P. Hon

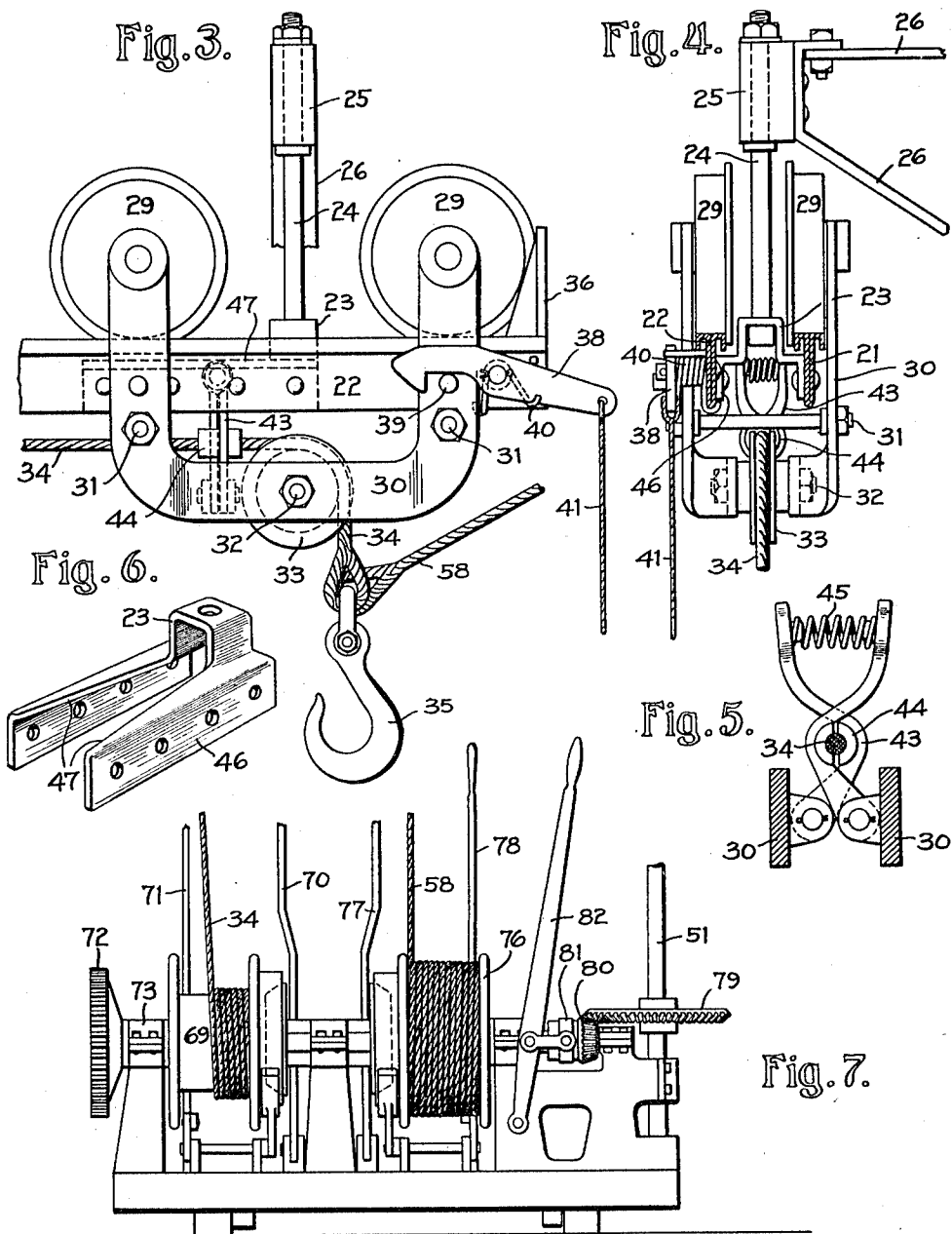
Inventors:
 Julius Smith
 Frank N. Lovejoy
 by their attorneys
 Osgood, Davis & Worsey

J. SMITH & F. N. LOVEJOY.
 TRACK LAYER FOR STEAM SHOVELS.
 APPLICATION FILED APR. 28, 1911.

1,001,317.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 2.



Witnesses:
 Clarence W. Carroll
 L. Thon

Inventors:
 Julius Smith
 Frank N. Lovejoy
 by their attorneys
 Osgood Davis & Dorsey

UNITED STATES PATENT OFFICE.

JULIUS SMITH AND FRANK N. LOVEJOY, OF MACEDON, NEW YORK.

TRACK-LAYER FOR STEAM-SHOVELS.

1,001,317.

Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed April 28, 1911. Serial No. 623,986.

To all whom it may concern.

Be it known that we, JULIUS SMITH and FRANK N. LOVEJOY, citizens of the United States, and residents of Macedon, in the county of Wayne and State of New York, have invented certain new and useful improvements in Track-Layers for Steam-Shovels, of which the following is a specification.

This invention relates to steam-shovels of the type adapted to run upon track-rails and provided with means by which the track-rails over which the shovel has passed are successively removed from the rear end of the track and transferred to the forward end, so that the machine may operate continuously over a comparatively short length of track.

The object of the present invention is to provide a steam-shovel with simple and efficient mechanism by which sections of track may be raised at the rear of the steam-shovel, transferred to the front of the shovel, and lowered into position for use, this mechanism being adapted particularly to operate without interfering with the operation of the shoveling-mechanism. To this end we employ a trolley-conveyer and a crane mounted upon the platform or body of the steam-shovel, and constructed and operating substantially as hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a plan-view of a steam-shovel provided with mechanism embodying the present invention; Fig. 2 is a side-elevation of the same; Fig. 3 is a side-elevation, on a larger scale, of the trolley by which the track is transferred from the rear to the front of the machine; Fig. 4 is a right-hand end-elevation of the trolley; Fig. 5 is a detail view of the rope-clutch by which the trolley is connected with the hoisting-rope; Fig. 6 is a perspective view of the trip-device by which the clutch is operated to release the rope; and Fig. 7 is a side-elevation of the actuating-mechanism of the apparatus.

The steam-shovel illustrated in Figs. 1 and 2 is of a well-known form, comprising a platform 11 mounted on ordinary wheel-trucks, illustrated diagrammatically in Fig. 2. The wheels run upon a track 13 which, for use in connection with the present invention, is formed in sections, each consisting of two short rails and suitable ties to which the rails are permanently fixed.

The shoveling-mechanism may be of any ordinary or suitable form, and it is not particularly illustrated in the drawings, except that Figs. 1 and 2 show the usual shovel-beam 14 which is sustained by stays 16 connected to the upper end of shears 17. The usual jacks 18 are also provided to sustain the machine against lateral strains.

The mechanism for actuating the shovel, comprising the usual steam-engines and hoisting apparatus, is not illustrated, but is inclosed within the usual body or housing 19 mounted upon the platform 11. At the rear end of the platform is the usual firing-deck 20 occupied by the fireman.

The apparatus embodying the present invention comprises a trolley-conveyer which extends, from a point directly in the rear of the machine, along one side to a point near the front of the machine. This conveyer comprises two rails 21 and 22 of T form, upon which the trolley-wheels run. The rails are connected and supported by yokes 23, each yoke being suspended on the lower end of a rod 24 which projects upwardly to a sufficient height to clear the tops of the wheels. The upper end of the rod 24 is fixed in a head 25, and the head is supported upon a bracket 26 fixed to the housing 19. At the rear-end of the machine the trolley-rails are curved, as shown in Fig. 1, to bring them behind the firing-deck, and at this point the rails are supported by means of struts 27 resting on the firing-deck and sustained by a guy 28 connecting the rails with the top of the housing.

The trolley is shown particularly in Figs. 3 and 4. It is provided with four flanged wheels 29 which run on the rails 21 and 22. The two wheels at each side are journaled at the upper ends of U-shaped side-frames 30, and these side-frames depend below the rails and are connected by upper and lower bolts 31 and 32, respectively, being suitably spaced by collars on these bolts. A sheave 33 is journaled loosely upon the lower bolt 32, and upon this sheave runs a hoisting-rope 34 provided with a hook 35.

At the forward and rear ends of the trolley-rails are posts 36 and 37, respectively, to prevent the trolley from running off the rails. To retain the trolley at the forward end of the rails when necessary, a latch 38 is pivoted on the rail 22 and coöperates with a pin 39 on the side-frame 30. This latch is normally held in engagement with

the pin by means of a spring 40, but it may be operated to release the trolley by pulling upon a hand-line 41 depending from the latch. At the rear end of the rails is a similar latch 42.

The rope 34 operates not only as a hoisting-rope, but also as a means for drawing the trolley along the trolley-rails. Accordingly a rope-clutch is provided by which the trolley may be fixed to the rope. This clutch, as shown in Fig. 5, comprises two levers 43 pivoted on lugs on the insides of the side-frames 30. The levers are provided with semicylindrical clutch-jaws 44 of wood, or other suitable material, and a spring 45, mounted between the upper ends of the levers, tends to swing them outwardly so as to grip the rope.

The clutch is released, when necessary, by means of a trip-device shown in Fig. 6. This trip-device is fixed between the trolley-rails, and is provided with inwardly-directed flanges 47 which are inclined toward each other. When the trolley reaches the forward end of its path of movement the upper ends of the levers 43 are engaged by the flanges, and the latter are so arranged as to force the levers together as the trolley completes its forward movement, thus releasing the rope from the action of the clutch. At the same time the latch 38 operates to retain the trolley in its forward position.

At the rear-end of the trolley-rails is a second trip-device 48 similar to that just described, but oppositely arranged so as to act as the trolley reaches the rearward extremity of its path of movement.

At the forward end of the machine is a crane which receives the track-sections from the trolley-conveyer and transfers them to a point immediately in front of the machine. To this end a vertical shaft 51 is journaled in the housing of the machine, and projects above the roof thereof. Upon this shaft is fixed an arm 52 of truss construction, and above the arm is a collar 54 loosely journaled on the shaft and stayed by means of guy-ropes 53 so as to support the shaft against the angular strains of the arm. A second arm 55 is pivotally connected with the free end of the arm 52, by means of a short vertical shaft 56. This latter shaft is fixed to the arm 55 and journaled loosely in the arm 52. The arm 55 carries, at its free end, a sheave 57 over which a hoisting-rope 58 runs, and one end of this rope is attached to the rope 34 and the hook 35.

The crane is provided with the two pivotally-connected arms just described in order that, while having the necessary length to extend sufficiently in advance of the machine and also to reach the forward end of the trolley-conveyer, its effective length may be diminished when swinging the crane around the side of the machine, where the space in

which the machine is operated is so narrow as to require this. This construction of the crane also permits the sheave 57 to be brought directly in front of the machine without interference between the crane and the shears 17.

To impart the necessary relative angular movements to the arms 52 and 55 a sprocket 59 is fixed on the shaft 56, and is connected, by means of a chain 60, with a sprocket 61 loosely journaled on the shaft 51. The sprocket 61 is fixed to a gear 62, and this gear is engaged by a pinion 63 on the upper end of a shaft 64. The latter shaft extends into the housing, and is provided at its lower end with a crank 65 by means of which it may be operated.

The two hoisting-ropes 34 and 58 may be operated by hoisting mechanism of any ordinary or suitable form. As illustrated, the rope 34 passes around guide-pulleys 66 at the curved portion of the trolley-conveyer, although it is drawn out of engagement with these pulleys when the trolley is at this portion of its track. At the rear-end of the conveyer the rope 34 passes around a guide-pulley 67, and thence to guide-pulleys 68 by which it is guided over the top of the housing and thence downward into the interior of the housing. The rope is actuated by means of a hoisting-drum 69.

As shown particularly in Fig. 7, the hoisting-drum 69 is controlled by the usual clutch-lever 70 and brake-lever 71. The mechanism by which these levers operate is not particularly illustrated, as devices of this kind are in common use. The hoisting-mechanism is actuated through a gear 72, by which it is connected with a steam-engine (not shown). The gear is fixed to a power-shaft 73 upon which the hoisting-drums are journaled in the usual manner.

The hoisting-rope 58 passes rearwardly above the arms of the crane, being guided at their pivotal joint by a guide-roller 74 journaled loosely on the upper end of the shaft 56. At the upper end of the shaft 51 the rope passes over a guide-pulley 75 and thence downwardly to a hoisting-drum 76. This drum is controlled, like the drum 69, by the usual clutch-lever 77 and brake-lever 78.

In order to impart the necessary swinging movements to the crane the shaft 51 is provided, near its lower end, with a bevel-gear 79 which coöperates with a pinion 80. This pinion is splined upon the power-shaft 73, and is provided with a loose collar 81 by which it is connected with a lever 82. By operating this lever the pinion may be engaged with, or disengaged from, the gear 79, and when in engagement therewith the shaft is rotated and the crane is swung in one direction or the other according to the direction in which the hoisting-engine is operated.

The operation of the machine as a whole will now be described.

Supposing the trolley to be at the rear-end of its track, in which position it is held by the latch 42, the rope-clutch at this time is held open by the trip-device 48. Accordingly, by releasing the brake of the hoisting-drum 69, the hook 35 is permitted to descend and a workman then engages it with a track-section in the rear of the machine. The drum 69 is then operated to pull on the rope 34, thus hoisting the track-section clear of the ground. The hoisting-drum 76 is next operated to pull upon the rope 58, while at the same time the latch 42 is held out of operation, so as to release the trolley. The rope 58 then pulls the trolley forward along the track. During this forward movement the rope 34 is allowed to run out freely, but the hook is held in raised position with the track-section through the action of the rope-clutch, as this clutch is thrown into operation by the first forward movement of the trolley. While the trolley is traveling forward upon the track the crane may also be allowed to swing rearwardly until its outer end is adjacent the forward end of the trolley-track. Accordingly, when the trolley reaches the forward end of the track and the rope-clutch is again opened, the weight of the track-section is transferred from the trolley to the rope 58 and the crane. The rope 34 is then allowed to run out freely, while the crane is swung around to the front of the machine, carrying the track-section with it. The crank 65 is then rotated to swing the crane arms into a relative position which will permit the arm 58 to reach a point at or near the middle-line of the track, and the hoisting-drum 76 is then released to permit the track-section to fall to the ground. The track-section is then placed in position by workmen, this being done preferably while one end of the section is still held in raised position by the crane. After the hook has been disengaged from the track-section the hoisting-drum 69 is again operated, causing the rope 34 to pull the trolley back to its original position in the rear of the machine ready to transfer another track-section.

We are aware that it has been previously proposed to provide a steam-shovel with means by which a track-section may be transferred from the rear to the front of the machine, these means consisting in a trolley-conveyer extending from a point directly in the rear of the machine, along one side of the machine, to a point directly in front of the machine, but the present invention is substantially distinguished from such a construction in that by the use of a trolley-conveyer extending alongside the shovel, but terminating at one side of the front thereof, in combination with a crane arranged to re-

ceive the track-sections from the trolley-conveyer and to transfer them to a point directly in front of the machine, we dispense with the necessity of a stationary structure, such as a trolley-track, extending rigidly in front of the machine where it may interfere with the operation of the shoveling-mechanism. The use of the crane with a vertical pivotal joint permits the arms of the crane to be arranged at such an angle that the crane avoids interference with the shoveling-mechanism, so that the track-section may be placed by the crane without the necessity of moving the shoveling-mechanism out of the way or into any particular position.

Our invention is not limited to the embodiment thereof hereinbefore described and illustrated in the accompanying drawings, but may be embodied in various forms within the nature of the invention, and it is defined in the following claims.

We claim:

1. In combination with a steam-shovel running on track-rails, a crane mounted at the forward end of the machine and provided with two arms pivotally connected upon a vertical axis so that the free end of the crane may be brought to a position directly in front of the machine without interference with the shoveling-mechanism.

2. In combination with a steam-shovel running on track-rails, a crane mounted at the forward end of the machine and provided with two arms pivotally connected upon a vertical axis so that the free end of the crane may be brought to a position directly in front of the machine without interference with the shoveling-mechanism, and means for producing relative angular movements of the arms about their pivotal connection.

3. In combination with a steam-shovel running on track-rails, a trolley-conveyer mounted thereon at the side and extending longitudinally of the machine, hoisting-mechanism connected with the conveyer, whereby rails may be hoisted upon the conveyer and conveyed from the rear toward the front of the machine, and a crane mounted on the front of the machine and comprising two arms pivotally connected about a vertical axis, the crane being adapted to receive rails from the conveyer and transfer them to a point directly in front of the machine without interference with the shoveling-mechanism.

4. In combination with a steam-shovel running upon track-rails, a trolley-conveyer mounted thereon at the side and extending longitudinally of the machine, a crane mounted at the front of the machine, and two hoisting-mechanisms comprising hoisting-ropes connected together and provided with means for securing them to a track-

section, one of said ropes passing over a sheave on the crane and the other rope passing over a sheave on the trolley.

5 In combination with a steam-shovel
running upon track-rails, a trolley-conveyer
10 mounted thereon at the side and extending
longitudinally of the machine, a crane
mounted at the front of the machine, two
15 hoisting-mechanisms comprising hoisting-
ropes connected together and provided with
means for securing them to a track-section,
one of said ropes passing over a sheave on
the crane and the other rope passing over a
sheave on the trolley, and a clutch on the
20 trolley for connecting the trolley with the
latter rope to cause the trolley to be moved
by the hoisting-mechanism.

6. In combination with a steam-shovel
20 running upon track-rails, a trolley-conveyer
mounted thereon at the side and extending
longitudinally of the machine, a crane

mounted at the front of the machine, two
hoisting-mechanisms comprising hoisting-
ropes connected together and provided with
means for securing them to a track-rail, one 25
of said ropes passing over a sheave on the
crane and the other rope passing over a
sheave on the trolley, a clutch on the trolley
for connecting the trolley with the latter
rope to cause the trolley to be moved by the 30
hoisting-mechanism, means for operating the
clutch automatically at the ends of the path
of movement of the trolley to release the
trolley from the hoisting-rope, and means
35 for retaining the trolley at the end of its
path of movement.

JULIUS SMITH.
FRANK N. LOVEJOY.

Witnesses:

D. GURNEE,
FARNUM F. DORSEY.

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