No. 739,387. PATENTED SEPT. 22, 1903.

J. E. CAILYER.

SNOW PLOW.

APPLICATION FILED MAY 21, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

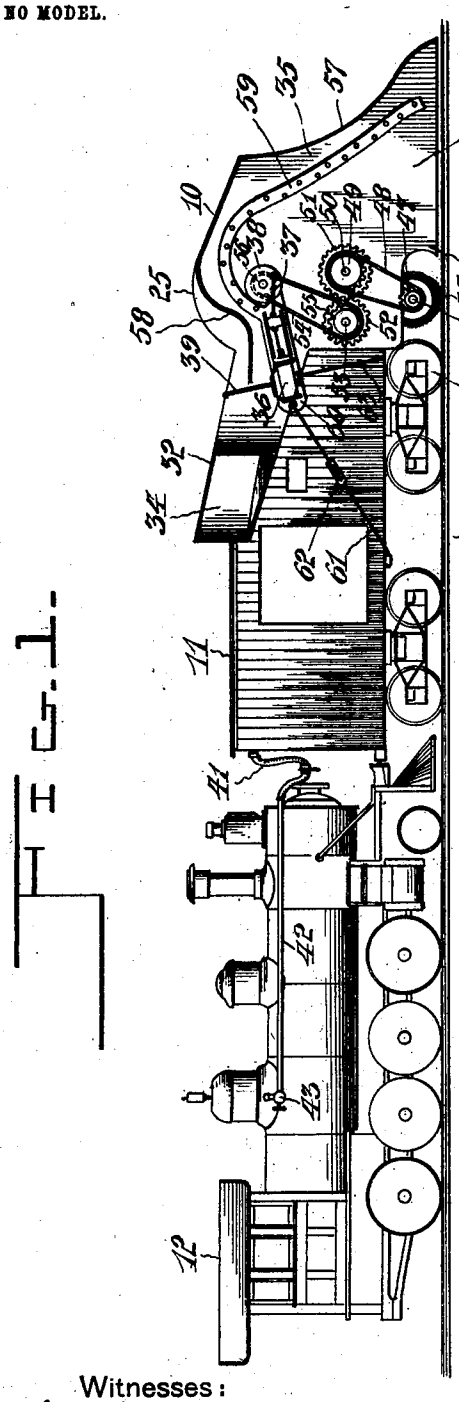


FIG. 1.

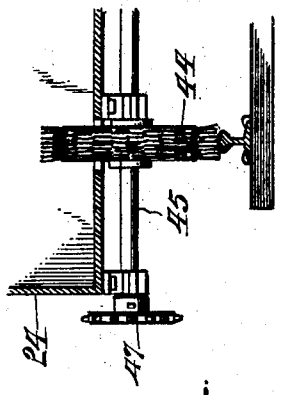


FIG. 8.

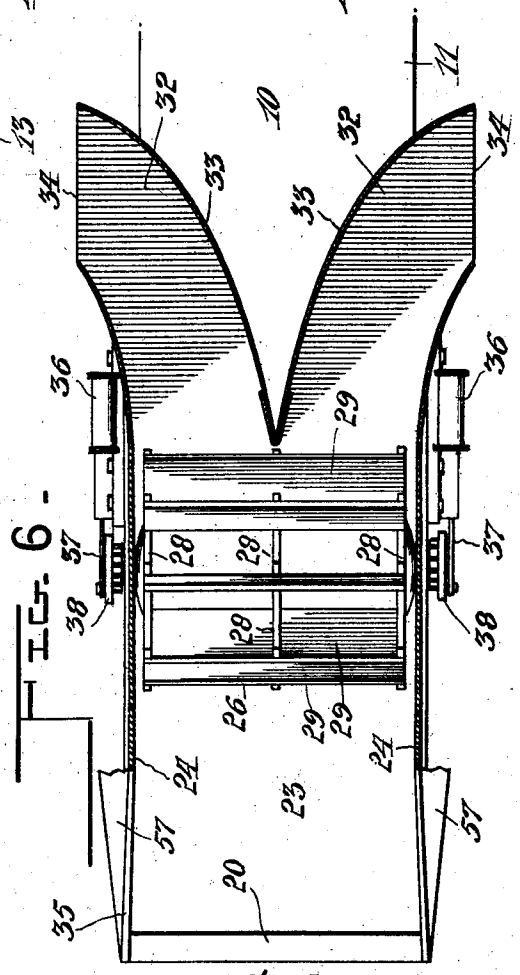


FIG. 6.

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NO MODEL. 3 SHEETS—SHEET 2.

FIG. 2.

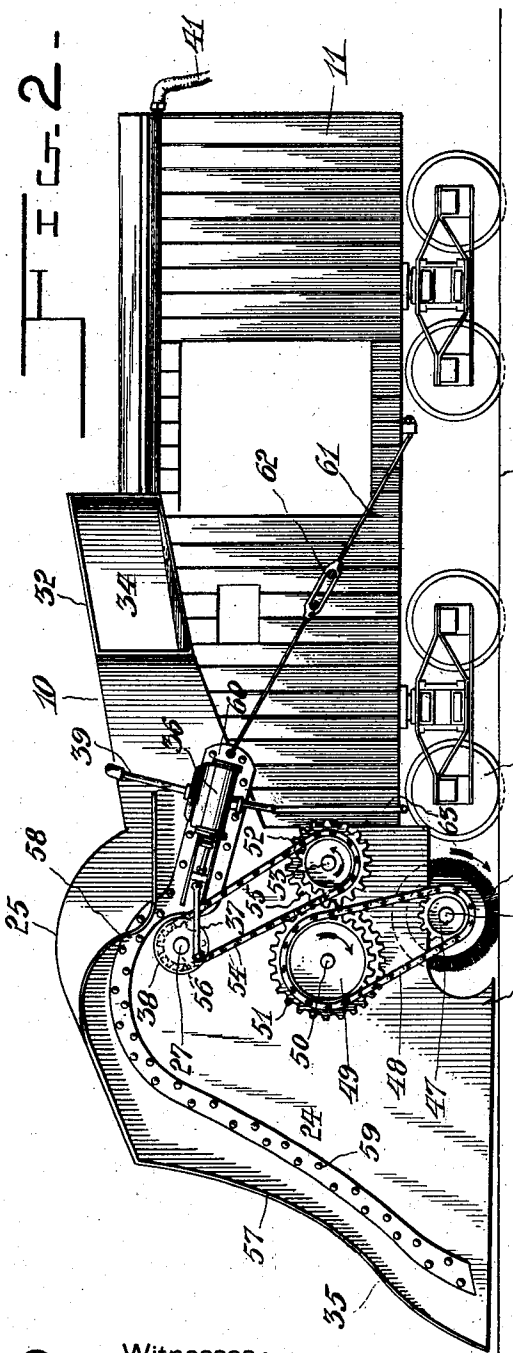
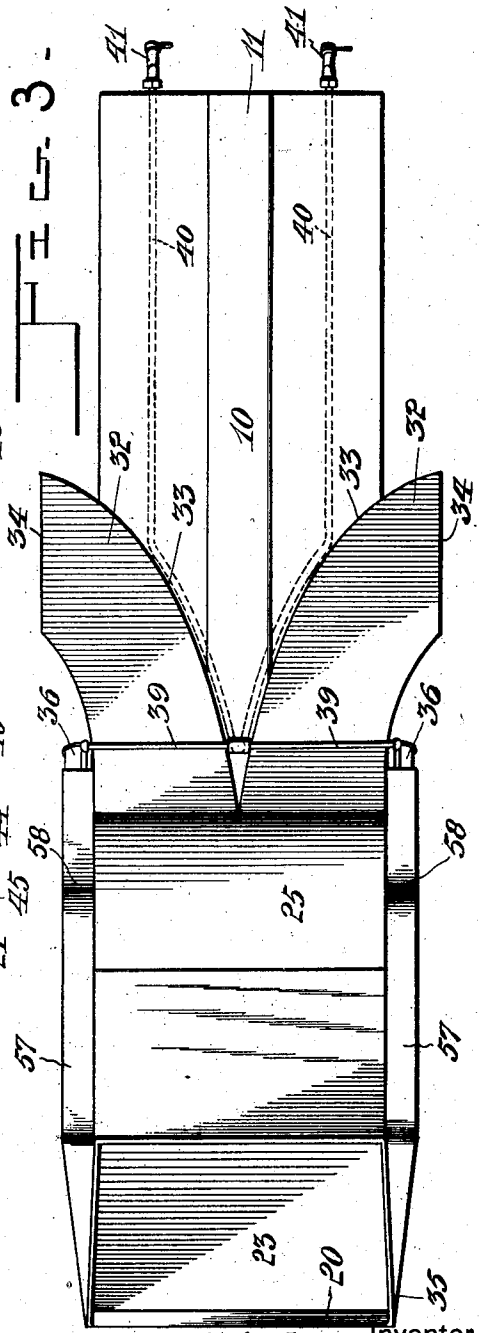


FIG. 3.



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NO MODEL. 3 SHEETS—SHEET 3.

FIG. 4.

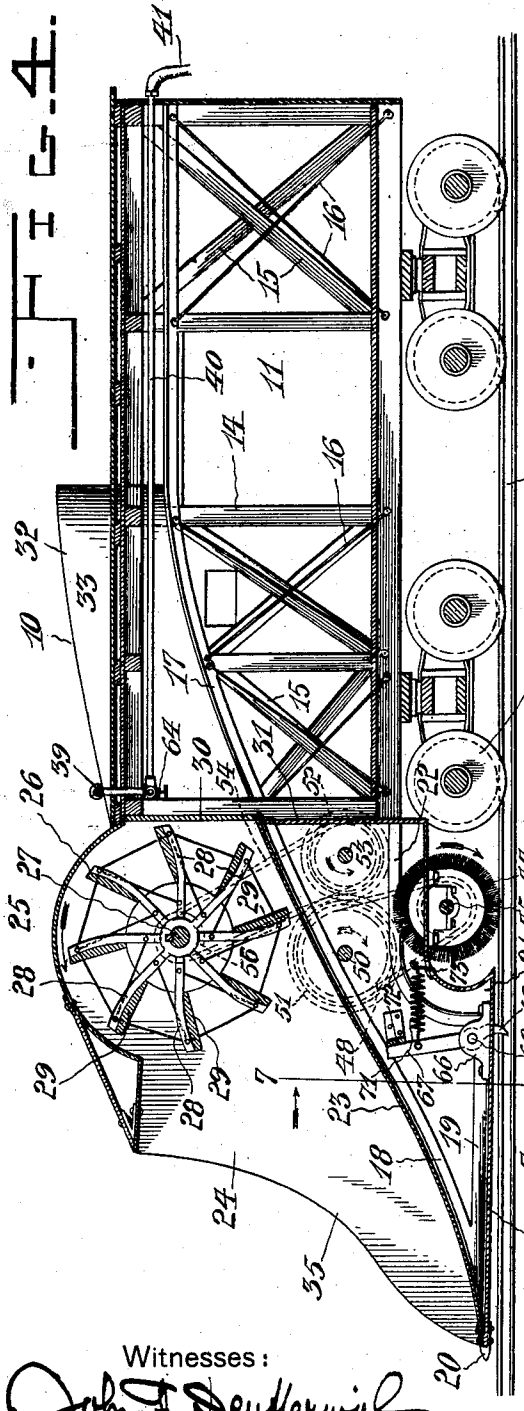


FIG. 7.

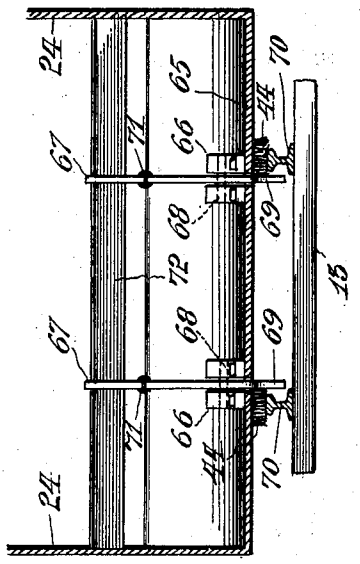
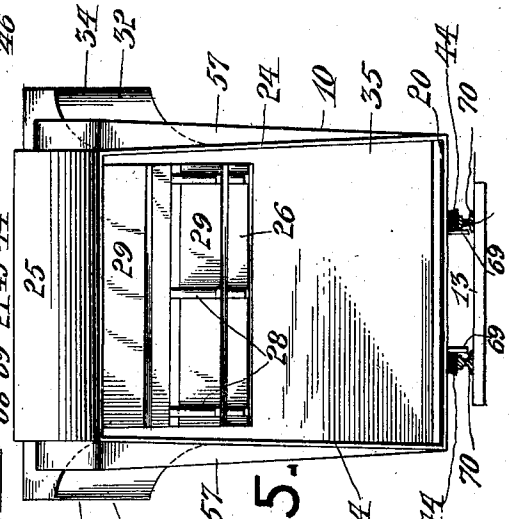


FIG. 5.



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No. 739,387. Patented September 22, 1903.

UNITED STATES PATENT OFFICE.

JOSEPH EUDORE CAILYER, OF ST. HENRY, CANADA.

SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 739,387, dated September 22, 1903.

Application filed May 21, 1903. Serial No. 158,150. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH EUDORE CAILYER, a subject of the King of Great Britain, residing at St. Henry, county of Hochelaga, Province of Quebec, Canada, have invented certain new and useful Improvements in Snow-Plows; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to snow-plows; and my object is to provide a powerful plow adapted to be used by railroads for clearing the track of snow. The plow is expected to be pushed along by a locomotive and is provided with special arrangements for throwing the snow to one side. The plow carries an engine of its own, which is supplied with steam from the locomotive and which drives a wheel which operates to facilitate the removal of the snow.

In its construction the invention also comprises an arrangement for digging ice out of the road-bed and for clearing the rails of snow immediately in front of the wheels. In practice the plow is so constructed that it is adapted to be secured to one end of an ordinary box-car, which car is then pushed along by a locomotive behind it.

The invention consists in the construction and combination of parts to be more fully described hereinafter, and definitely set forth in the claims.

In the drawings, which fully illustrate my invention, Figure 1 represents the plow in side elevation in connection with a locomotive, which is represented as pushing the plow along. Fig. 2 represents the plow in elevation in connection with a box-car, the view being taken from the opposite side to that shown in Fig. 1 and being upon a much-enlarged scale. Fig. 3 is a plan of the plow as shown in Fig. 2. Fig. 4 is a vertical longitudinal section upon the same scale as Fig. 2, the view being taken looking in the same direction. Fig. 5 is a front elevation of the plow, showing the track-rails in cross-section. Fig. 6 is a substantially horizontal section through the upper part of the plow, the forward portion of the plow being shown simply in plan, as will appear. Fig. 7 is a cross-section supposed to be taken substantially on the line 7 7 of Fig. 4. Fig. 8 is a cross-section taken at one side of the plow to illustrate certain brushes used in clearing the rails of snow.

Throughout the drawings and specification the same numerals of reference indicate like parts.

Referring more particularly to the parts, 10 represents the plow, which, as illustrated, is adapted to be secured to the end of an ordinary box-car 11, behind which car a locomotive 12 affords means for pushing the car ahead, so as to advance the plow upon the track 13. It should be understood that such a construction is adopted for the plow as enables it to be supported in a substantial manner upon the box-car, dispensing with trucks and supporting-wheels for the plow itself, the idea being to adapt a box-car of ordinary construction to the purposes of the plow by making slight alterations or additions thereto with this end in view.

Referring specially to Fig. 4, it should appear that the inner framework 14 of the box-car is well adapted to withstand the force to which the car is subjected during the plowing operation, braces and struts 15 being liberally used, as will appear, in connection with suitable tie-rods 16. This framework supports a pair of oppositely-disposed stringers or girders 17, which extend throughout the length of the car at either side of the same, as shown, and which extend beyond the car and incline downwardly forwardly thereof, so as to constitute a plow-frame 18. This plow-frame may comprise substantially horizontal members 19, which extend rearwardly from the point or tip 20 of the plow to a point near the heel 21, whence they are formed into upper horizontal members 22, which attach at their rear to the forward portion of the car, as illustrated. The frame members 18 are preferably slightly curved, as viewed in Fig. 4, so as to facilitate the raising of the snow from the track. They support a suitable plate 23, which extends continuously from side to side of the track between the side plates 24, which side plates are preferably of substantially the form shown, having upper curved portions which support a hood or cover 25, which hood conforms substan-

tially in outline to the periphery of a wheel 26, which is instrumental in effecting the removal of the snow. As illustrated, this wheel 26 is rigidly mounted upon a substantial horizontal shaft 27, which is disposed transversely with respect to the track and the ends of which are mounted in side plates 24 aforesaid. In its construction this wheel comprises a plurality of substantially radially disposed arms 28, to which are attached paddles or beaters 29, the said paddles being disposed upon the forward side of the said arms with reference to the direction of rotation. It should appear that the plow comprises vertical plates 30 and 31, which are adapted to attach to the forward framing of the car, as illustrated most clearly in Fig. 4. It should appear that the plate 23, in connection with the sides and other parts, constitutes an immense shovel 35. The rear of this shovel is formed into outwardly-inclining branches 32, the sides of which are preferably curved, as indicated at 33, and the mouths 34 of these branches are located in such a position as to deliver the snow which passes through them at either side of the track, as will be readily understood. It will of course be unnecessary to say that the wheel 26 is for the purpose of projecting the snow through these branches 32 as it is picked up by the shovel 35.

Upon the outer sides of the side plates 24 are disposed the small engines 36, one being attached to each plate, as shown. They are disposed in an inclined position, as indicated, and their connecting-rods 37 actuate disk-cranks 38, which are rigidly carried by the aforesaid shaft 27, operating to rotate the wheel 26 in the direction of the arrow, and so that the paddles move rearwardly adjacent to the aforesaid plate 23. These engines 36 are supplied with steam through the branch pipes 39, which connect with steam-pipes 40, disposed substantially longitudinally of the box-car 11, as indicated. Suitable hose connections 41 at the rear of the car connect these pipes 40, respectively, with steam-pipes 42, carried, respectively, at the sides of the locomotive, as shown, suitable valves 43 being provided for controlling the flow therethrough.

In order to clear the rails of snow, a pair of oppositely-disposed brushes 44 are provided which are rigidly carried upon a transverse shaft 45, mounted upon the under portion of the plow, so that the brushes lie just ahead of the forward wheels 46 of the car. These brushes are driven continuously in a direction opposite to that in which the wheels 46 turn, as indicated by the arrow. These brushes are driven through their shaft 45 by means of sprocket-wheels 47, which are disposed at the extremities of said shaft, and over which sprocket-chains 48 pass. These chains are driven by sprocket-wheels 49, carried rigidly upon a transverse shaft 50, which shaft is itself driven from the engine by means of the gears 51 and 52, the latter of which are carried rigidly upon a transverse shaft 53, and this shaft 53 is driven by chains 54, running over sprocket-wheels 55, rigid with the same, the said sprocket-chains being driven by sprocket-wheels 56, which are rigidly mounted upon the aforesaid shaft 27 of the wheel 26.

On their outer sides the aforesaid side plates 24 are provided with laterally-projecting flanges or shields 57, which are disposed along the edge of the plates, as shown, and which are depressed, as at 58, substantially above the engines and the mechanism immediately connected with them, affording means for protecting them from quantities of snow which may be thrown in their direction by the advance of the plow. The side plates 24 are very substantially stiffened by means of the curved plates 59, disposed substantially as shown and riveted in position. At their rear these plates enlarge, as shown, so as to form substantial base-plates 60 for the engines, and to these base-plates are attached the extremities of tie-rods 61, having suitable turnbuckles 62 for tightening the same. From this arrangement it should appear that the engines are effectually braced. The exhaust from the engines may be led away by means of the exhaust-pipes 63, and suitable valves 64 are provided within the box-car in connection with the pipes 40 for controlling the flow of steam to the engines.

As stated, arrangement is made for clearing the track of ice between the rails. For this purpose the bottom plate or sole 65 of the plow is provided with a pair of oppositely-disposed bearings 66, which carry scraper-levers 67, suitably mounted upon studs or pivots 68, and which terminate below in hooks or claws 69, the points of which project in the direction in which the plow is advanced in such a manner as to operate to scrape up and clear the track of ice and similar obstructions. As shown, they are located just inwardly of the rails 70. They are resiliently constrained in the operative position by means of stout helical springs 71, which springs constrain them against a cross beam or bar 72, disposed transversely within the body of the plow for this purpose. From this arrangement it will appear that the claws 69 may have a possible rearward movement; but they will be returned again to their normal position by means of the springs, as will be readily understood. These springs are carried at their rear by brackets 73, suitably mounted upon the body of the plow.

It will readily appear that the construction described constitutes an efficient plow for the purposes mentioned. As the plow is advanced by the tractive force of the locomotive the wheel 26 is rotated so as to drive toward the rear the snow which it receives from the shovel and which the shovel has just raised from the track, it being understood that these paddles throw the snow toward the rear, forcing the same through the rearwardly-inclined branches 32, already described, in

such manner as to deliver or deposit the snow at either side of the track and out of the roadway.

While the construction described is especially adapted for use on single-track roads, it could easily be adapted for use on double-track roads with slight modifications of design. The rear portion of the plow in plan now presents substantially the appearance of the upper portion of a capital Y, the forks of which are of substantially equal length. Unless the snow had accumulated in very great quantities it is thought that it would be feasible under ordinary circumstances to use the construction described on double-track railways, the quantity of snow which would be deposited between the tracks by the plow not being great enough to interfere with the passage of trains along the track.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the structures set forth.

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

1. In a snow-plow, in combination, a shovel adapted to raise snow from the track, a wheel rotatably mounted upon said shovel, and rotating in a plane extending in the same general direction in which the shovel advances, said shovel having rearwardly-inclined curved branches through which the snow is projected by said wheel, said branches being adapted to deliver the snow at the side of the track.

2. In a snow-plow, in combination, a shovel having a pair of opposite and laterally-curved rear branches, a wheel rotatively mounted at the junction of said branches with the body of said shovel, said wheel being adapted to rotate in a plane having the general direction in which said shovel advances.

3. In a snow-plow, in combination, a shovel having a pair of oppositely-disposed laterally-curved rear branches, a wheel rotatively mounted at the junction of said branches with the body of said shovel, said wheel being rotatable in the direction in which said shovel advances, and adapted to project snow rearwardly through said branches, side plates in which said wheel is rotatively mounted, and engines carried by said side plates and adapted to rotate said wheel.

4. In a snow-plow, in combination, a shovel having a pair of oppositely-disposed laterally-curved rear branches, said shovel having side plates, a wheel rotatably mounted in said side plates, and adapted to project snow rearwardly through said branches, a truck upon which said shovel is mounted, a rotary brush operating upon the track in advance of the wheels of said truck, engines carried by said side plates, and mechanism connecting the same with said wheel and said brush.

5. In a snow-plow, a shovel comprising side plates and adapted to be pushed by a locomotive, engines carried by said side plates, a wheel carried by said shovel and adapted to operate upon the snow, and means for delivering steam to said engines from said locomotive.

6. A snow-plow comprising a shovel having side plates, in combination with a brush operating upon the track, engines carried by said side plates, and means for delivering steam to said engines from a locomotive pushing said plow.

7. In a snow-plow, in combination, a car adapted to be pushed by a locomotive, a shovel carried forwardly thereof, a brush carried by said shovel and operating upon the track, an engine adapted to actuate said brush, and a steam-pipe leading thereto from the rear of said car.

8. In a snow-plow, in combination, a shovel comprising side plates, a car carrying said shovel at the forward end thereof, a wheel adapted to operate upon the snow picked up by said shovel, a brush adapted to operate upon the track in front of said car, engines carried by the said side plates and adapted to actuate said wheel and said brush, and steam-pipes leading to said engines from the rear of said car.

9. In a snow-plow, in combination, a shovel having side plates and laterally-projecting shields therebeyond, mechanism for removing snow, and actuating mechanism therefor carried beneath said shields.

10. In a snow-plow, in combination, a shovel comprising side plates and laterally-projecting shields thereabove, a wheel carried by said shovel and adapted to operate upon the snow raised thereby, and oppositely-disposed engines carried below said shields and adapted to actuate said wheel.

11. In a snow-plow, in combination, a shovel comprising side plates, movable mechanism carried by said shovel for operating upon the snow, engines carried by said side plates adapted to actuate said movable mechanism, and stiffening-plates carried by said side plates and constituting base-plates for said engines.

12. In a snow-plow, in combination, a shovel comprising side plates, movable mechanism carried by said shovel and adapted to operate upon the snow, a pair of oppositely-disposed engines carried by said side plates and adapted to actuate said movable mechanism, plates carried by said side plates and constituting base-plates for said engines, said plates having elongated extensions disposed across said side plates and adapted to stiffen the same.

13. In a snow-plow, in combination, a lever

having a dependent claw adapted to lie adjacent to the bed of the track, a spring constraining said lever, and a fixed stop against which said lever rests.

14. In a snow-plow, in combination, levers pivoted whereby they may be moved substantially in a vertical plane substantially parallel with the direction of the track, said levers having claws adapted to lie adjacent to the bed of the track, a bar against which said levers may rest, and springs constraining said levers against said bar.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOSEPH EUDORE CAILYER.

Witnesses:
T. MYNARD,
M. MCALEER.