No. 683,682. Patented Oct. 1, 1901.

J. W. DERBY.

SNOW PLOW.

(Application filed Aug. 23, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

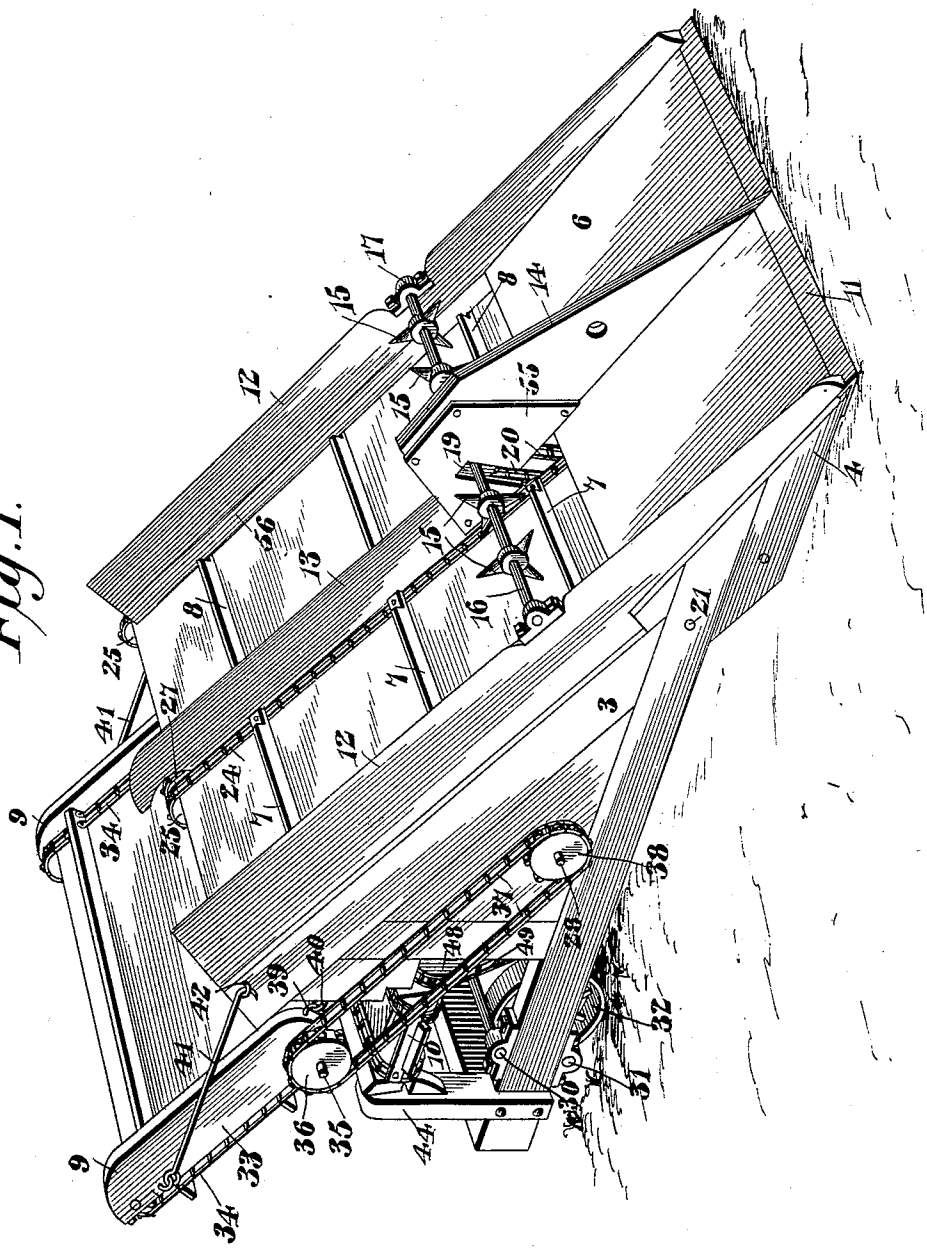

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Fig. 2.

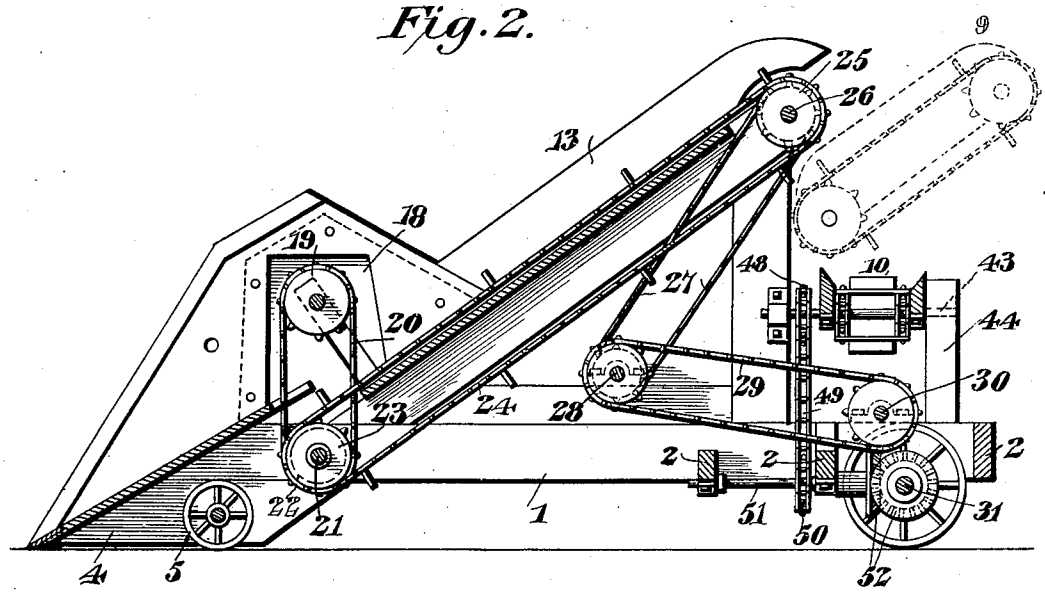


Fig. 3.

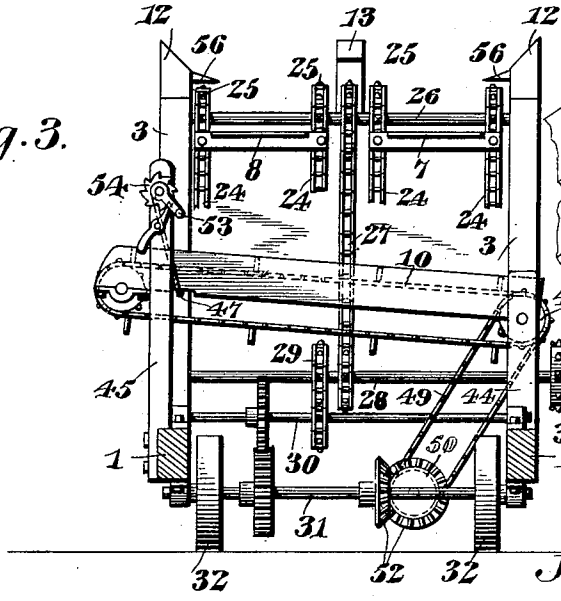
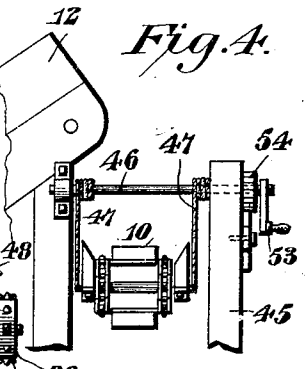


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES W. DERBY, OF BOWLING GREEN, OHIO.

SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 683,682, dated October 1, 1901.

Application filed August 23, 1900. Serial No. 27,837. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. DERBY, a citizen of the United States, residing at Bowling Green, in the county of Wood and State of Ohio, have invented a new and useful Snow-Plow, of which the following is a specification.

This invention relates to a novel snow-plow designed particularly for the clearing of railway-tracks, but capable of use in various other connections.

The object of the invention is to produce a plow adapted to be propelled by horse-power or by a mechanical motor and equipped with elevating mechanism arranged to deposit the snow and ice upon a lateral conveyer for delivery at a point beyond one side of the plow or upon a supplemental elevator extending rearwardly from the plow to effect the delivery to a receptacle behind the plow—as, for instance, a car employed to propel the apparatus and to receive the snow and ice removed from the track.

In a somewhat more specific aspect an object of the invention is to so relate the supplemental elevator and the lateral conveyer that the snow will ordinarily be deposited upon the supplemental elevator, which latter is detachably mounted in a plane intermediate of the upper end of the elevator and the lateral conveyer in order that by its removal the snow will be deposited directly from the elevator into the lateral conveyer when it is desired to deposit the snow along the side of the tracks.

To the accomplishment of these objects and others subordinate thereto, as will hereinafter more fully appear, the invention is comprehended in the preferred embodiment thereof to be described, illustrated in the accompanying drawings, and succinctly defined in the appended claims.

In said drawings, Figure 1 is a perspective view of my snow-plow complete. Fig. 2 is a sectional view thereof. Fig. 3 is a sectional view in a plane at right angles to Fig. 2, and Fig. 4 is a detail view illustrating the mechanism for regulating the inclination of the lateral conveyer.

Referring to the numerals of reference employed to designate corresponding parts throughout the views, 1 1 indicate the longitudinal base-beams of the frame of my device rigidly retained in properly-spaced relation by a number of transverse beams 2 and supporting an inclined elevator-frame 3, extending upwardly from a point adjacent to the front ends of the beams 1 and terminating at a considerable elevation, as shown. The under sides of the beams 1 are provided at their forward ends with runners 4, which may rest directly upon the ground or tracks or may be elevated slightly thereabove by truck-wheels 5, as shown in Fig. 2. The front ends of the runners 4 and beams 1 are severed at an angle, as shown, to form a seat for the plow or scoop 6, extending upwardly across the lower end of the frame in a plane parallel with the upper surface of the elevator-frame, so that snow and ice may be deposited from the plow upon the endless conveyers or elevators 7 and 8 movable over the face of the frame 3 to effect the elevation of the snow for deposit upon a supplemental elevator 9 or a lateral conveyer 10, as the case may be.

The front edge of the plow 6 is preferably tipped by a steel or other suitable shoe 11, and at the sides of the plow are provided upstanding longitudinal cutters 12, having their upper edges sharpened, as shown, and extended along the sides of the elevator-frame to the upper or rear end thereof, as shown, to impart a receptacle-like form to the face of the plow and elevator. The space intermediate of these longitudinal cutters or side rails is subdivided throughout the length of the elevator-frame by an intermediate longitudinal cutter or rail 13, enlarged at its lower end to define a comparatively heavy upstanding share or ice-breaker 14, designed to effectually divide the body of ice or show to cause it to be deposited upon the conveyers 7 and 8 at opposite sides of the medial or intermediate rail 13. These divided sections of the material are decimated at the upper end of the plow by rotary breakers 15, extending radially from breaker-shaft 16, journaled in suitable bearings 17, preferably mounted upon the rails 12. The shaft 16 passes through the upper end of the share or stationary breaker 14, which is cut away to form a housing 18 for a sprocket-wheel 19, mounted on the shaft 16 and geared, as by a sprocket-chain 20, to the lower elevator-shaft 21 through the medium of a second sprocket-wheel 22. The shaft 21 is also provided with sprocket-wheels 23 for the reception of the conveyer-chains 24

of the conveyers 7 and 8, which chains at the upper end of the conveyer are passed around sprockets 25, mounted upon the upper elevator-shaft 26, suitably journaled in the elevator-frame and geared, as by a sprocket-chain 27, with a transverse shaft 28, journaled in suitable bearings below the elevator.

Motion is imparted to the shaft 28 through a sprocket-chain 29 upon a transverse shaft 30, geared to the driving-shaft 31 of the apparatus, said last-named shaft preferably having keyed thereon a pair of traction-wheels 32, which support the apparatus at the rear and serve to operate the shaft 31 as the device is propelled. Obviously, however, the driving-shaft 31 might be operated by a mechanical motor or other suitable means, and the form and arrangement of the gearing may be varied in many respects.

At the rear end of the elevator-frame is detachably mounted the supplemental elevator 9, comprising a short frame-section 33 and an endless conveyer 34, one shaft 35 of the latter being provided with a sprocket-wheel 36, geared, as by a sprocket 37, to a sprocket 38 upon one end of the shaft 28 and preferably, although not necessarily, beyond the side of the frame. The lower or front end of the supplemental elevator 9 is located directly under the upper or rear end of the elevator and is detachably connected to the elevator-frame—as, for instance, by hooks 39 engaging the staples 40 extending therefrom. When in place, as shown in Fig. 1 of the drawings, the upper end of the supplemental elevator is suspended by elongated hangers 41, permanently carried by the frame 33 and having their opposite extremities hooked for engagement with the staples 42 at opposite sides of the frame 3. As heretofore stated, the supplemental elevator is designed for use when it is desired to convey the elevated snow and ice to a receptacle—as, for instance, a car located behind a plow; but it is mounted detachably at a point intermediate of the elevator and the lateral conveyer 10 for the purpose of permitting its removal to cause the snow and ice to be delivered from the elevator to the lateral conveyer for delivery beyond one side of the plow. The lateral conveyer 10 is therefore permanently supported at the rear end of the frame—as, for instance, by journaling the opposite ends of one of the conveyer-shafts 43 upon the frame 3 and upon a standard 44, the lateral conveyer being disposed across the frame and having its end opposite the shaft 43 extended beyond the side of the apparatus and disposed between the rear end of the frame 3 and a second standard 45.

Suitably journaled above the projected or free end of the lateral conveyer I provide a conveyer-supporting shaft 46, upon which are wound cables 47, connected to the free end of the frame of the lateral conveyer and designed as the shaft is rotated to be wound upon the shaft 46 for the purpose of elevating or depressing the free end of the conveyer 10 in order to effect the delivery of the snow and ice at any point desired. The driving of the lateral conveyer may be effected in any suitable manner, but I prefer to mount a sprocket 48 upon one end of the shaft 43 for engagement with a sprocket-chain 49, passed around a sprocket 50 upon a shaft 51, geared, as by bevel-gears 52, to the driving-shaft 31.

The conveyer or adjusting shaft 46 is preferably operated by a crank 53 and is retained by pawl-and-ratchet mechanism 54. In order to protect the working parts of the device from the material handled, the housing 18 in the share or stationary cutter is closed by slotted guard-plates 55, and the conveyer-chains, located adjacent to the side rails 12, are covered by longitudinally-disposed overhanging guards or sheds 56, extending laterally from said rails, the rear end of the intermediate rail 13 overhanging and serving as a guard for the connection between the sprocket-chain 27 and the shaft 26.

The operation of my device is as follows: Assuming the supplemental elevator 9 to be attached, as illustrated in Fig. 1, and the plow to be pushed by a suitably-driven car, the shoe 11 will rest upon or immediately above the tracks, and the advancement of the plow will cause the snow and ice to be detached and forced upwardly over the inclined surface of the scoop 6. The cutting edges of the longitudinal cutters 12 and the heavy share 14 will divide the debris of the sections to facilitate their delivery to the endless conveyers 7 and 8 of the elevator, and as these sections are being delivered from the plow to the elevator the rotary breakers or cutters 15 will effectually loosen the ice and snow to facilitate the operation of the conveyers and the delivery of the material to the supplemental elevator for conveyance to the car or other receptacle. It will be evident that the continuation of the cutters 12 and 13 throughout the length of the plow and elevator will permit the apparatus to operate effectually for the removal of snow and ice of considerable depth, the capacity of the machine being limited only, in fact, by the elevation or height of the upper end of the elevator. If now it is desired to deposit the material at one side of the apparatus, the supplemental elevator 9 is removed, and the snow and ice delivered from the upper end of the elevator will gravitate upon the lateral conveyer 10 and will be conveyed thereby to a point beyond the side of the device. The elevation at which the lateral conveyer will deliver the material may be readily determined by operating the shaft 46 to raise or lower the free end of the conveyer 10, as desired.

From the foregoing it will be observed that I have produced a durable and effective snow-plow for removing snow and ice from the beds of railways and equipped with means for delivering the debris from the rear of the machine in the longitudinal direction thereof

or in a lateral direction from the side; but while the present embodiment of the invention is believed at this time to be preferable I do not limit myself to the structural details defined, as, on the contrary, I reserve the right to effect such changes, modifications, and variations as may fall properly within the scope of the protection prayed.

What I claim is—

1. In a device of the character described, the combination with a plow comprising a scoop having longitudinal cutters at its side edges and an upstanding share or ice-breaker at its center, said share being provided with a cutting edge extending the entire length of the scoop and inclined upwardly from the surface of the scoop at its front edge, of an elevator disposed to receive the snow, &c., from the scoop.

2. In a device of the character described, the combination with a plow comprising an inclined scoop having longitudinal cutters at its side edges and an upstanding share or ice-breaker at its center, said share being provided with a cutting edge extending the entire length of the scoop and inclined upwardly from the surface of the scoop at its front edge, of an inclined elevator-frame extending from the rear end of the scoop, longitudinal cutters upstanding therefrom, and conveyers movable over the elevator-frame.

3. In a device of the character described, the combination with a plow comprising an inclined scoop and an upstanding share located at the center thereof, and provided with a cutting edge extending the entire length of the scoop and inclined upwardly from the surface of the scoop at its front edge, of an elevator-frame extending from the rear end of the scoop, and upstanding longitudinal cutters disposed continuously along the side edges of the scoop and elevator-frame, an intermediate longitudinal cutter extending over the elevator-frame from the rear end of the share, and conveyers movable over the face of the elevator-frame intermediate of the cutters.

4. In a device of the character described, the combination with a plow comprising a scoop and upstanding share, of an elevator disposed to receive the contents of the scoop, and a rotary breaker disposed directly above the delivery end of the scoop.

5. In a device of the character described, the combination with a plow comprising a scoop and an upstanding share at the center thereof, of an elevator disposed to receive the contents of the scoop, a breaker-shaft extending transversely across the delivery end of the scoop, breakers mounted upon the breaker-shaft, and operating mechanism for the breaker-shaft, said operating mechanism being housed in the share.

6. In a device of the character described, the combination with a plow comprising a scoop, and an upstanding medial share, of an elevator-frame disposed to receive the contents of the scoop, longitudinal cutters located at the side edges of the scoop and elevator-frame, an intermediate longitudinal cutter extending from the rear end of the share and disposed over the elevator-frame, endless conveyers movable over the frame and located, respectively, intermediate of the longitudinal cutters, a breaker-shaft journaled in suitable bearings upon the longitudinal cutters and located at the delivery end of the scoop, and operating mechanism for the breaker-shaft, said mechanism being housed within the share.

7. In a device of the character described, the combination with a plow provided with a scoop and upstanding share, of an elevator disposed to receive the contents of the scoop, a rotary breaker disposed directly above the delivery end of the scoop, and a series of longitudinal cutters disposed adjacent to the elevator.

8. In a device of the character described, the combination with a plow comprising a scoop and upstanding share, of an elevator-frame disposed to receive the contents of the scoop, longitudinal cutters disposed upon said frame, conveyers movable over the elevator-frame intermediate of the cutters, and a rotary breaker disposed directly within the delivery end of the scoop.

9. In a device of the character described, the combination with a plow comprising a scoop and upstanding share, of an elevator-frame disposed to elevate the contents of the scoop, cutters and conveyers disposed above the elevator-frame, a rotary breaker located above the delivery end of the scoop, and a lateral conveyer disposed to receive the snow, ice, &c., conveyed beyond the elevator-frame from the scoop.

10. In a device of the character described, the combination with a plow comprising a scoop and an upstanding longitudinal share at the center thereof, of an inclined elevator-frame at the rear of the scoop, longitudinal cutters extending continuously along the side edges of the scoop and elevator-frame, a medial, longitudinal cutter extending over the elevator-frame from the rear end of the share, a breaker-shaft extending across the delivery end of the scoop and provided with radial breakers, endless conveyers located to move over the face of the elevator intermediate of the longitudinal cutters, a lateral conveyer-frame adjustably mounted below the delivery end of the elevator and extended beyond one side of the device, an endless conveyer movable over said lateral conveyer-frame, a driving-shaft geared to the several conveyers, and means for operating said shaft.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES W. DERBY.

Witnesses:
L. C. EDGAR,
ROBERT DUNN.