Nov. 6, 1928. 1,690,886

P. A. CROMBIE, JR

SNOW SCRAPER

Filed Dec. 2, 1927

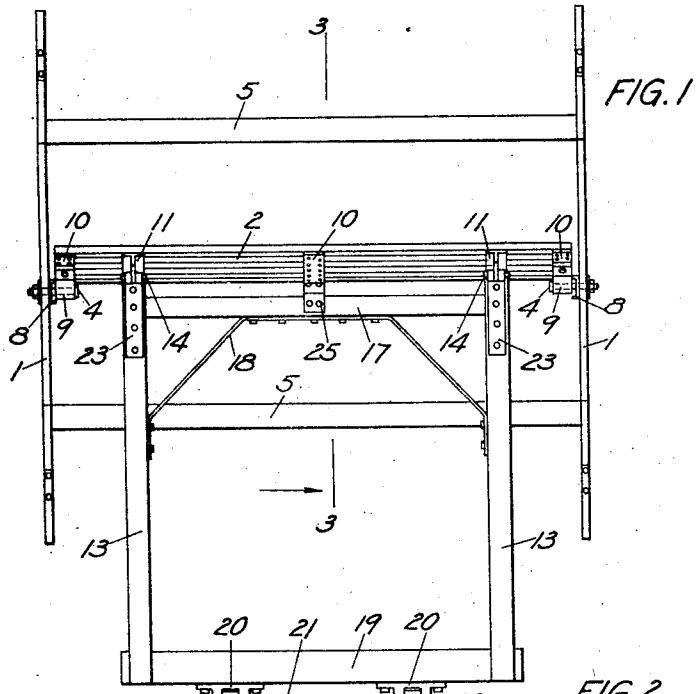


FIG. 1

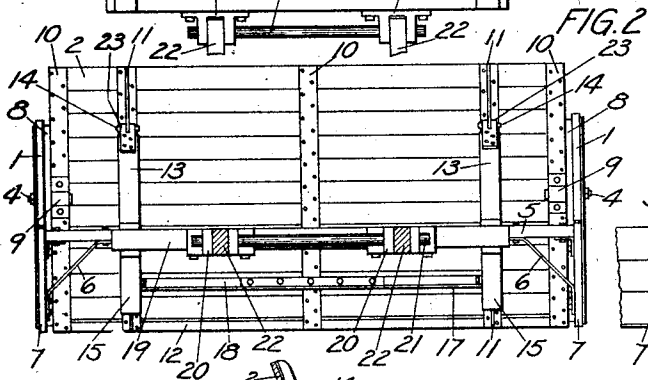


FIG. 2

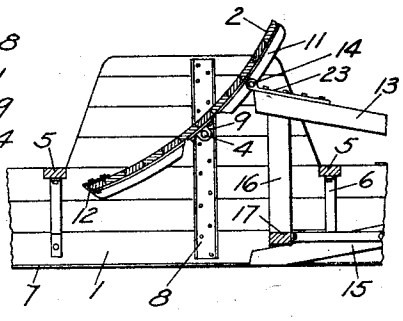


FIG. 4

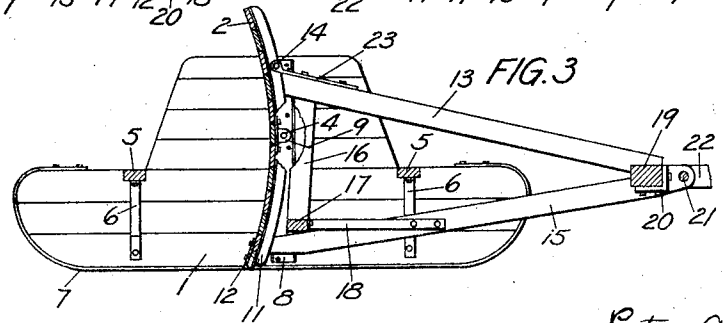


FIG. 3

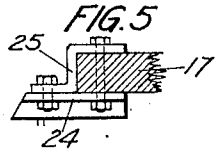


FIG. 5

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UNITED STATES PATENT OFFICE.

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SNOW SCRAPER.

Application filed December 2, 1927. Serial No. 237,181.

My invention relates to improvements in snow scrapers in which are employed oscillatory blades and pushing elements for such blades, which elements actuate the blades into and out of operative position, accordingly as the power, generally supplied by trucks, be applied in a forward direction or in a backward direction, and consists of the parts and members and combinations of the same as hereinafter set forth.

The principal object of my invention is to produce a comparatively simple and inexpensive, strong and durable, and highly efficient scraper for removing snow from ice fields, roads, and other places where a machine of this character is capable of being used to advantage, which scraper is so constructed that the blade is automatically moved into operative position when the scraper is pushed forward, and adequately supported in such position, not only near the top, but also near the bottom where said blade is subjected to the greatest strain, so that buckling on the part of the blade is prevented, and other injury that might occur in the absence of the bottom support is also prevented, and said blade is automatically moved not only into inoperative position when the scraper is drawn rearwardly, but into position to enable the blade to clear any snow or obstacles or obstructions in the rearward path. Thus ample clearance is afforded when the scraper is drawn in a rearward direction, and adequate strength provided when the scraper is in active use.

Other objects and advantages will appear in the course of the following description.

I attain the objects and secure the advantages of my invention by the means illustrated in the accompanying drawings, in which—

Figure 1 is a top plan of a snow scraper which embodies a practical form of my invention; Fig. 2, a rear elevation of said scraper; Fig. 3, a cross section through the scraper, taken on lines 3—3, looking in the direction of the associated arrow, in Fig. 1; Fig. 4, a similar cross section, with parts omitted, showing the blade in inoperative position, said blade being in operative position in the other views, and, Fig. 5, an enlarged detail, in side elevation of the intermediate brace on the pusher.

Similar reference characters designate similar parts throughout the several views.

This snow scraper consists in general of a pair of runners 1, a blade 2 between said runners and pivotally connected at its ends therewith, as represented at 4—4, and a pusher hereinafter described in detail.

The runners 1 are of any suitable construction capable of sliding on ice or along the ground, and of supporting the other elements of the scraper. In the present example the intermediate portions of the runners 1 extend upwardly, and said runners are connected with each other in front of and behind the upwardly extending portions by means of two cross pieces 5. Four braces 6 are provided to assist in securing together the runners and cross pieces. The runners, if made of wood as in the present example, are provided on their running edges with shoes 7—7. Secured to each runner on the inner side thereof is a vertical channel-iron 8 situated a little behind the transverse, vertical center of said runner, and one of the pivots 4 passes through said channel-iron and through a bearing 9 secured to what may be termed the back side of the blade 2. The pivots 4 are located a little above the horizontal, central plane of the runners, and about midway of the longitudinal or horizontal edges of the blade.

The blade 2 may be made of wood or other material, and is somewhat arcuate in shape with the concave surface on the front or upper side, according to the position of said blade. The blade is reenforced on the back side by means of a central and two end, arcuate, metal straps 10, and two arcuate T-irons 11, the latter being located a short distance in from the end straps. The bearings 9 are secured to the end straps 10. The bottom or lower edge of the blade 2 is reenforced by means of a metallic shoe 12.

The blade 2 is so supported from the runners 1, and the parts are so proportioned relatively, that, when said blade is down in an approximately vertical position, the shoe 12 bears on the same surface which supports the runner shoes 7, and, when said blade is swung or rocked on the pivots 4 in the direction to carry said first-named shoe upwardly, the latter may be and is positioned at a sufficient distance from said surface to clear any snow or ordinary obstacle or obstruction thereon.

The pusher, of which mention has been made, consists essentially of two upper side beams 13 having their forward terminals pivotally connected at 14—14 with the T-irons 11 on the back side of the blade 2, two under side beams 15, and such connecting and tie

parts and members as may be necessary or desirable. Preferably I prefer to arrange the beams 13 and 15 on each side so that they form an acute angle at their rear ends, it being necessary in any event that said beams be quite widely separated at their forward ends. In this construction the beams 13 and 15 on each side of the scraper have their forward terminals separated and rigidly held in place by means of an upright 16 which is rigidly secured at its ends to said beams. There are two of these uprights and a cross piece 17 extends between them just above the beams 15 and at the ends is rigidly secured to said uprights. Further to insure the rigidity of the structure, a metallic brace 18 has its intermediate portion secured to the back side of the cross piece 17, and its terminals secured to the inner sides of the beams 15. The beams 13 and 15 at their rear ends are rigidly secured to a cross beam 19. The cross beam 19 is provided with a pair of lugs 20 perforated to receive a pin 21 by means of which the tractor or truck used to propel the scraper is connected with the latter. Portions of truck connecting members appear at 22—22.

In each of Figs. 3 and 4 an intermediate portion of the T-iron 11 therein appearing is broken out, and in Fig. 3 a portion of the upright 16 therein appearing is broken away, in order to show in full the bearing 9 that is present in these views.

Each pivot 14 passes through the rearwardly projecting flange of one of the T-irons 11, and through a bifurcated and perforated lug in the forward end of a strap-hinge member 23 secured to the top of each of the beams 13 and projecting beyond the front end of said beam. The pivots 14 are located about midway between the horizontal plane in which the axes of the pivots 4 are located and the upper edge of the blade 2.

The front ends of the beams 13 and 15 and the pivots 4 and 14 are so positioned relatively that, when the blade 2 is in an approximately horizontal position, said blade is received against said ends of said beams 15.

Obviously, if the pusher be advanced, it acts through the pivots 14 to rock the blade 2 on the pivots 4 into an approximately vertical position and into a position where said blade at points near the bottom edge bears against the front ends of the under beams 15, and, if said pusher be retracted, said blade is rocked on said second-named pivots in a manner to remove it from contact with said under beams and into an inactive and safe position. In the first instance the beams 13 and 15 respectively bear against the blade 2 above and below the pivots 4, said blade fulcrums on said pivots, and a rigid condition between the parts, whereby the blade is held firmly in position, and the forward movement imparted to the pusher is transmitted, through said pivots to the scraper as a whole. The greater the force applied to the blade above the more firmly is it pressed into contact with the under beams 15, and any load in front of the blade below the horizontal plane of said pivots has a similar effect. When the blade is in operative position, the beams 13 move into contact therewith, thus taking the strain from the pivots 14.

The T-irons 11 are the parts of the blade 2 which come into direct contact with the beams 13 and 15.

Briefly, the operation of this scraper is described as follows, assuming that the same is connected with a tractor or truck.

When the scraper is drawn rearwardly the pusher actuates the blade 2 into the position shown in Fig. 4, where the bottom edge of said blade is located some distance above the surface on which the runners 1 are travelling. At this time the forward-terminal portions of the beams 15 are down on the aforesaid surface (on which they slide) and so limit the downward movement of the pusher at the forward end, and the amount of rocking movement imparted to the blade 2 by the pusher when first carried rearwardly, thus the scraper can be drawn freely and readily to any locality, and likewise returned each time to the starting point when engaged in the operation of removing snow.

Upon pushing the scraper forwardly, the pusher rocks the blade 2 in the direction to carry the lower portion thereof into contact with the front ends of the beams 15, the forward end of said pusher then being carried upwardly, by reason of its pivotal connection with said blade, until said beams clear the supporting surface. With the blade 2 thus located in operative position, as best shown in Fig. 3, the snow in front of the same is scraped up and carried forward with the advancing scraper, until a sufficient load accumulates, when said scraper is hauled back away from said load. Then the scraper may be moved into position for a repetition of the aforesaid operations.

Provision may be made to support the blade 2, when in operative position, in direct contact with the front end of the pusher at any greater number of points than two, and even at all points in the line of support. In Figs. 1 and 5 I show intermediate supporting means of this character, such means consisting of a T-iron 24 secured to underside of the cross piece 17 in the center, and projecting forwardly beyond said cross piece to receive on the front end the intermediate strap 10, when the blade 2 is rocked into operative position, with the T-irons 11 in contact with the front ends of the beams 15. The free end of the T-iron 24 is shaped to conform more or less closely with the curvature of the contiguous portion of the intermediate strap 10. An angle-iron 25 may be provided to relieve the

T-iron 24 of some of the strain thereon from the blade 2. The angle-iron 25 is bolted with the T-iron 24 to the cross bar 17, and also to said T-iron.

More or less change in the shape, size, construction, and arrangement of some or all of the parts of this scraper may be made without departing from the spirit of my invention, or exceeding the scope of what is claimed.

I claim:

1. A snow scraper comprising runners, a blade pivotally mounted between said runners, and a pusher having parts pivotally connected with said blade, and parts unconnected with but adapted to receive and support said blade below its pivotal connections with said runners, when the blade is in operative position.

2. A snow scraper comprising runners, a blade pivotally mounted between said runners, and a pusher pivotally connected with said blade above and adapted to support said blade below the plane of the pivotal connections between said blade and said runners, whereby when said pusher is moved forwardly the lower portion of the blade is actuated against the same, and when the pusher is moved rearwardly said lower portion is carried away from the pusher and the blade is actuated into inoperative position.

3. In a snow scraper, runners, a blade pivotally mounted between said runners, and a pusher having its front end at the top pivotally connected with said blade above the plane of the pivotal connections between said blade and said runners, and having its front end at the bottom unconnected with said blade but adapted to receive and support the lower portion of the blade when rocked forwardly at the top by the action thereon of said pusher when moved forwardly.

4. In a snow scraper, runners, a blade pivotally mounted between said runners, and a pusher comprising upper and under side beams, said upper beams at their front ends being pivotally connected with said blade, and said under beams at their front ends being unconnected with said blade but adapted to receive and support the lower portion of the blade when the blade is in operative position.

5. In a snow scraper, runners, a blade pivotally mounted between said runners, and a pusher comprising upper and under side beams, said upper beams at their front ends being pivotally connected with said blade above the plane of the pivotal connections between said blade and said runners, and said lower beams at their front ends being unconnected with said blade but adapted to receive and support the lower portion of the blade when the latter is in operative position, and to rest on the supporting surface when the blade is rocked on said pivotal connections clear of said surface, said pusher then moving downwardly on the pivotal connections between it and the blade.

6. The combination, in a snow scraper, with runners, and a blade pivotally connected, intermediate of its horizontal edges, with said runners, of a pusher comprising upper side beams pivotally connected with said blade above the plane of said first-named pivotal connections, under side beams in position to be contacted with and support said blade when in operative position, but unconnected with the blade, a cross beam connecting said side beams at their rear ends, and connecting members for said side beams at their forward terminals.

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