

Oct. 27, 1964

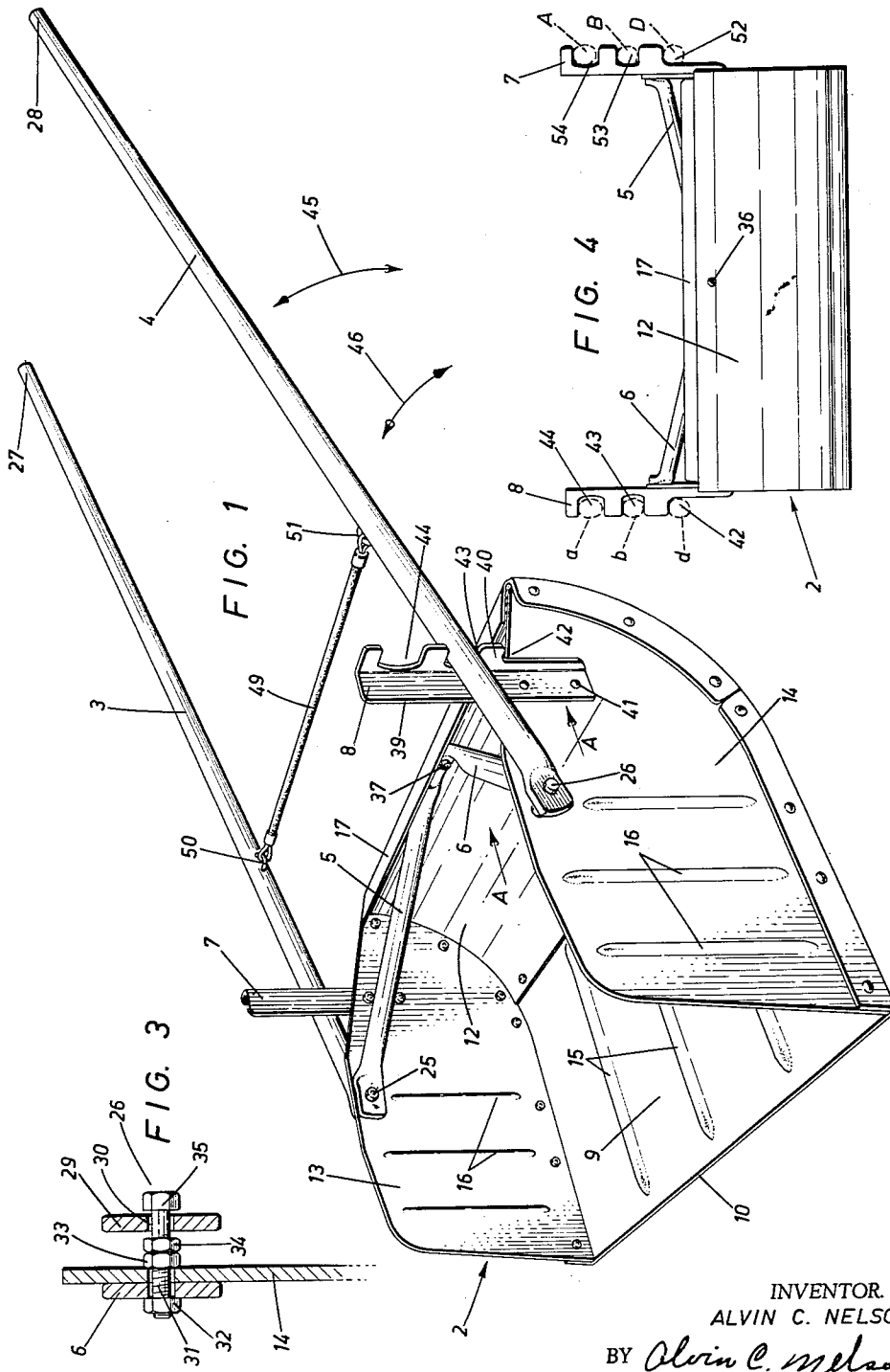
A. C. NELSON

3,154,336

MANUALLY OPERATED SNOW REMOVING DEVICE

Filed Jan. 24, 1963

3 Sheets-Sheet 1



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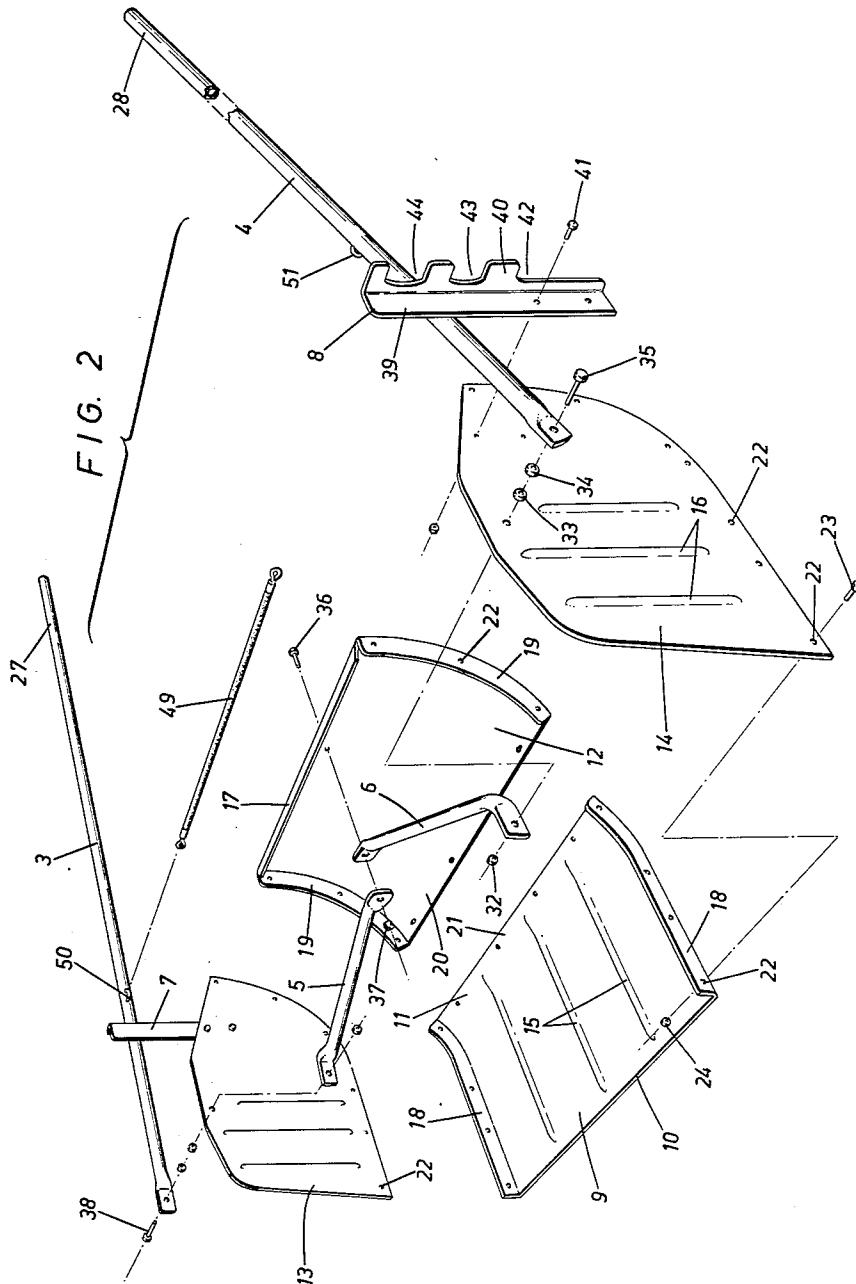
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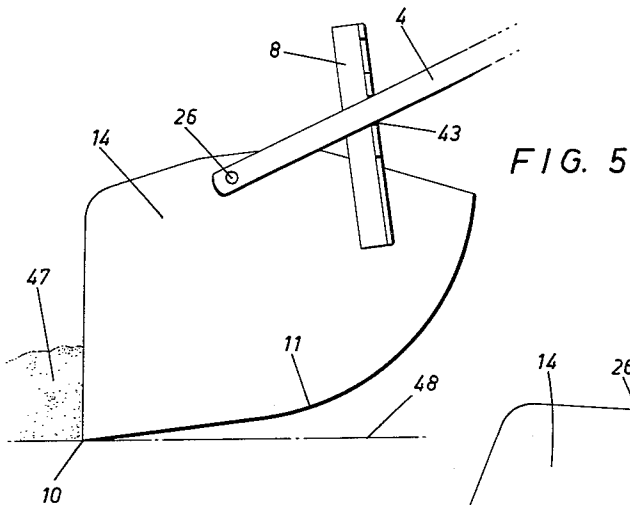
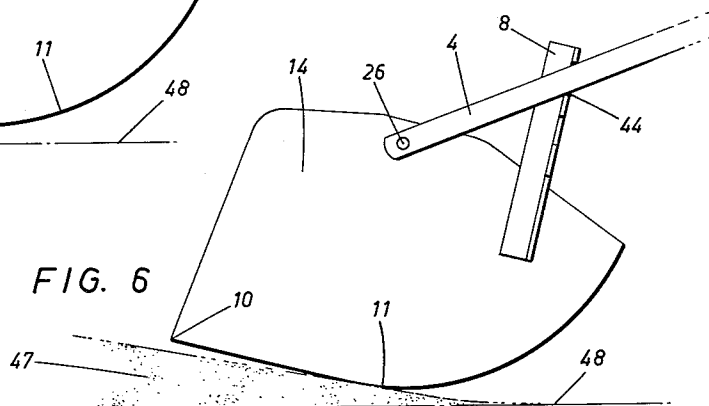
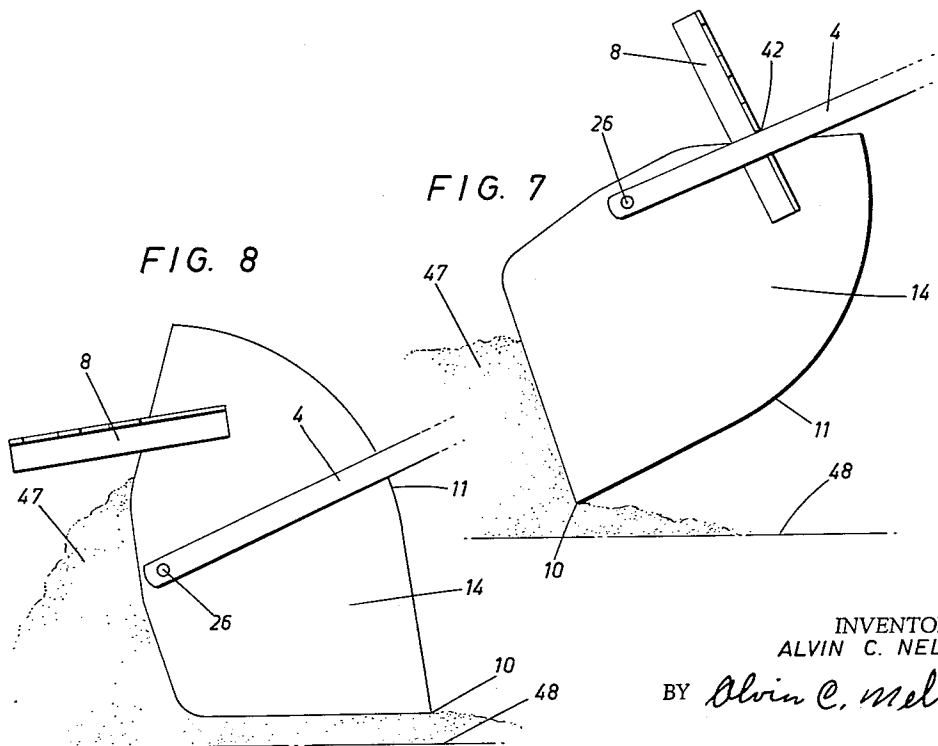
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3,154,336

MANUALLY OPERATED SNOW REMOVING DEVICE

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Filed Jan. 24, 1963, Ser. No. 254,049

4 Claims. (Cl. 294-54)

My invention relates to manually operated snow removal devices, and has for its principal object the provision of a snow receiving scoop which can be manipulated with relative ease by an operator from a natural upright working position without heavy lifting and with little bending. Other objects and advantages of my invention will become apparent from the following description taken in connection with the accompanying drawings in which:

FIGURE 1 is a view in perspective of the snow removal device;

FIGURE 2 is an exploded view in perspective of the device shown in FIGURE 1;

FIGURE 3 is a view in cross-section of a pivotal support for a handle as seen on section A—A of FIGURE 1;

FIGURE 4 is a view in elevation of the rear side of the scoop showing the means for positioning the handles, and illustrating in dotted lines the various positions in which the handles can be placed; and

FIGURES 5 to 8 illustrate various positions in which the scoop can be manipulated in relation to a working surface.

In FIGURE 1 there is shown a snow removal device comprising a scoop 2 braced by members 5 and 6, and adapted to be manually manipulated by means of two separate handles 3 and 4 coacting with handle positioning members 7 and 8 respectively. Scoop 2 has a bottom wall 9 which is flat for some distance rearward of its leading edge 10 and then curved upwardly at 11 to become a curved rear wall 12, and it has a pair of end walls 13 and 14 joined to walls 9 and 12 to define therewith a snow receptacle open at its top and forward sides as illustrated. The scoop may be formed with integral walls 9, 12, 13 and 14 from a single sheet of metal such as steel, or it may be an assembly of a number of separate parts as illustrated in FIGURES 1 and 2. To be practical, the scoop should be quite large, say of the order of 32 inches between the end walls, 26 inches from the leading edge of the bottom wall to the top of the rear wall, and 15 inches high; therefore, a scoop made from a number of separate parts may be preferred over a unitary structure because the parts can be packaged when made and assembled by the ultimate user, assembly instructions being included in the package. A relatively simple way of securing the parts together is by means of bolts and nuts as illustrated in FIGURE 2. In this particular construction the ends of walls 9 and 12 are formed with flanges 18 and 19 adapted to overlap the bottom and rear edge portions of end walls 13 and 14, and the lower edge portion 20 of wall 12 is adapted to overlap a portion 21 along the rear edge of wall 9. The overlapping wall portions have aligned apertures 22 formed therein for receiving the shanks of bolts 23, and nuts 24 are threaded onto the bolts for clamping the mating surfaces together. The handles, braces and handle positioning members may also be secured to the scoop by means of bolts and nuts in a way to be described, and therefore supplied as parts along with the parts of the scoop. A structure knocked down in this way tends to reduce the size of the package required, and therefore the cost of packaging, shipping, handling and storing. Manufacturing methods and tools well known in the sheet metal art may be used to form either the parts for

the scoop or the unitary structure. In order to stiffen the structure of the scoop, its walls may have certain regions deformed into long ridges of U-shaped cross-section such as indicated at 15 in bottom wall 9 and at 16 in end walls 13 and 14 respectively. A flange 17 along the upper edge of rear wall 12 will add further stiffness to the structure.

My novel means for manipulating the scoop will be described now. One end of handle 3 is attached to the outer side of end wall 13 and a corresponding end of handle 4 is attached to the outer side of end wall 14 by means 25, 26 respectively which permit relative rotation between the scoop and the handles and limited pivotal movement of each handle independently on axes transverse to the axis of rotation, i.e., pivotal movement of each handle laterally with respect to its end wall. The handles extend rearward from the scoop and the other ends 27 and 28 of the handles are adapted to be grasped by the hands of an operator standing erect therebetween with his hands near his sides at a level near that of the side pockets of his pants, i.e., the operator in a convenient working position and with his hands also in convenient working positions. Preferably, handles 3 and 4 are identical as are means 25 and 26 for attaching the handles to the end walls of the scoop. Therefore, only means 26 for attaching handle 4 to wall 14 will be described in detail with reference to FIGURES 2 and 3. Handle 4 may be a straight, rigid metal tube about 3/4 inch in diameter and about five feet long, its forward end may be flattened at 29 and the flat portion provided with a transverse aperture 30. A bolt 31 has its unthreaded shank located in aperture 30, its threaded shank extending through aligned apertures in wall 14 and brace 6, and it is secured thereto by means of nuts 32 and 33 threaded onto the bolt against members 6, 14 respectively. A third nut 34 may be threaded onto the bolt on the outside of nut 33 to space flat portion 29 of the handle outwardly of the wall. In FIGURE 3 aperture 30 is shown as being considerably larger than the shank of the bolt, and the distance between nut 34 and the head 35 of the bolt is shown as being considerably greater than the thickness of portion 29 of the handle. This has been done to give the handle complete freedom of pivotal movement about the shank of the bolt and limited freedom of pivotal movement on axes transverse to the axis of the bolt, the latter movement being limited by the clearances provided for portion 29 of the handle. In other words, the handle is supported loosely on the shank of the bolt between bolt head 35 and nut 34 so it can pivot freely on the shank as indicated by arrow 45, and also pivot to a limited extent laterally with respect to end wall 14 as indicated by arrow 46 (FIGURE structurally and functionally but reversed in the order 1). Pivot means 25 for handle 3 is the same both structurally and functionally but reversed in the order of the parts; its bolt 38 is in the same relative position on end wall 13 that bolt 31 is on end wall 14, and it too serves a second purpose, i.e., to secure one end of brace 5 to end wall 13. The other ends of the two braces overlap and are secured to the upper mid portion of rear wall 12 by means of a bolt 36 and a nut 37 as illustrated in FIGURE 2. The braces stiffen the scoop, and help distribute the forces applied to the pivotal means.

Each handle is movable on its pivotal means independently of the other, and cooperates with separate means for interlocking it with the scoop, such that the scoop can be manipulated by means of the handles, i.e., member 7 cooperates with handle 3 and member 8 with handle 4. Members 7 and 8 are opposite handed but otherwise the same; member 8 will be described in detail because it is

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more clearly illustrated in FIGURES 1 and 2. Member 8 may be formed from a flat strip of metal bent on its longitudinal axis into an elongated right angular member having flanges 39 and 40. One end portion of flange 39 is secured to the outer side of end wall 14, intermediate pivotal means 26 and rear wall 12 by means of two bolts 41 in such a way that the other end portion of the member projects upright from the upper edge of the wall with flange 40 projecting outwardly from the wall. A large portion 42 of the lower end portion of flange 40 has been removed, and two notches 43 and 44 have been formed in the upper portion of flange 40. In order to avoid weakening the member unduly, the entire flange should not be removed at 42, 43 and 44; some of flange 40 at the juncture thereof with flange 39 should be left as shown in FIGURES 1 and 2. The size of notches 43 and 44 is such that handle 4 is received freely into each notch, and the relative positions of notches 44, 43 and cut-out 42, i.e., spacing between notches 44, 43 and between notch 43 and cut-out 42, is selected for ease of manipulation of the scoop by its handles when the handles are held in convenient working positions by the operator.

Since the configuration of member 7 and its relation to wall 13 is the same functionally as that of member 8 to wall 14, it will cooperate with handle 3 in the same way that handle 4 cooperates with member 8. In FIGURE 4 the cut-out and notches in member 7 corresponding with 42, 43 and 44 have been designated 52, 53 and 54 respectively. Whenever a handle is engaged in a notch it is interlocked with the scoop, and as a result up or down movement of the handle will cause the scoop to roll on its bottom wall. When a handle is free of its two notches it is free to pivot up or down with respect to the scoop, and when both handles are free of their notches the scoop is free to rotate on pivotal means 25, 26.

The operation of the device will now be described. Normally, during loading of the scoop and dumping thereof, the operator will stand between the handles with the scoop in front of him and grasp end 27 of handle 3 in his right hand and end 28 of handle 4 in his left hand. However, while travelling with the scoop either loaded or unloaded, the operator may find it more convenient to reverse his position and pull the scoop behind him rather than push it in front of him. Each handle can be moved independently of the other to any one of three positions for cooperation with its positioning member, i.e., the positions A, B and D for handle 3 in member 7 and a, b and d for handle 4 in member 8 illustrated in FIGURE 4. For ease of manipulation of the scoop, i.e., little reaching and bending by the operator, the handles should be moved alternately step-by-step from one position to another. FIGURES 5 to 8 illustrate four working positions for the scoop and the normal position of the handles for each; the four positions for the handles are very similar because the handle positioning members are designed to permit the operator to hold the handles at a convenient height above the ground when he is pushing or pulling the scoop. That is, when the operator is engaged in his heaviest work, he will hold the handles in a position where this work can be done with minimum exertion. In order to change the position of the scoop some bending and reaching will be required of the operator, but these maneuvers are relatively effortless because the scoop is not being pushed or pulled along the ground at the same time. To move a handle from one position to another in its positioning member, first the operator moves the end of one handle that he is holding a short distance in a direction away from the other handle causing its other end to pivot on the scoop pivotal means on an axis transverse thereto, thereby disengaging the handle from the notch in which it was seated; next he moves the handle up or down on its pivotal support to the next notch; and then he engages the handle in this notch by reversing the procedure of the first step.

FIGURE 5 shows the scoop in position for loading,

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in which position the handles are at B, b of the handle positioning members, the leading edge 10 of bottom wall 9 rests on surface 48, and the rear portion 11 of wall 9 is raised from surface 48. While held in this position, the scoop is loaded by pushing it into snow 47, edge 10 scraping surface 48 as the scoop advances. When the scoop is full of snow, the handles are moved up to A, a and then turned downward to tilt the scoop backwards to the position shown in FIGURE 6, in which position the scoop rests on curved portion 11 of its bottom wall with edge 10 well elevated. While in the FIGURE 6 position, the scoop can be pushed easily over the snow to a dumping area and up a relatively steep incline of a pile of snow formed by dumping. To dump the load in the scoop, the scoop is tilted forward to the position shown in FIGURE 7 by first moving one handle down a notch, followed by raising it to tilt the scoop, and then moving the other handle in the same way until both handles rest at D, d. In this position the snow will usually be released from the scoop by pulling it quickly toward the operator, or if necessary, the scoop can be overturned to the position shown in FIGURE 8 by pushing the handles forward to rotate the scoop on its edge 10. The scoop can be turned back to the FIGURE 7 position by simply pulling on the handles, after which the scoop can be manipulated into one of the other two handle positions.

Referring again to the drawings, it will be seen that pivotal means 25 and 26 are located relatively high up on the end walls and well back from the leading edges thereof. When the scoop is in position for dumping, as shown in FIGURE 7, the pivotal means is located some distance from and almost directly above leading edge 10. This arrangement is preferred for designs where the scoop is to be overturned because the moment arm from leading edge 10 on which the scoop pivots is relatively long, enabling the operator to overturn the scoop with a moderate push.

During loading of the scoop and travelling thereof up the inclined surface of the pile of snow, the scoop is pushed with the operator facing it. After the scoop has been dumped, it is sometimes convenient for the operator to turn around and pull the empty scoop behind him back to the loading area, where he turns back into a pushing position. While turning around, the operator usually will let go of one or both handles, in which case they may slip out of their notches and fall to the ground. To prevent this from happening, an elastic member 49, such as a stranded rubber rope, may be stretched between the handles from a hook 50 on handle 3 to another hook 51 on handle 4 as shown in FIGURE 1. Hence member 49 urges the handles toward each other into their respective notches; the force applied to the handles by the member is relatively light and can be overcome with very little effort by the operator. Member 49 is placed far enough back on the handles that it does not interfere with rotation of the scoop.

The foregoing describes an embodiment of my invention preferred in practice, and I do not intend to be limited to the details described because they can be modified without departing from the spirit of the invention.

I claim:

1. A manually operated snow removing device comprising a snow receiving scoop adapted for sliding movement over snow and manipulation to loading, travelling and dumping positions by means of a pair of handles individually operable by an operator; said scoop having a bottom wall with a leading scraper edge thereon and a rear portion curving upward to become a curved rear wall; a pair of end walls joined to said bottom and rear walls to define therewith a scoop open at the front and top thereof; first pivotal means secured to one end wall and projecting outwardly therefrom; a handle loosely supported at one end thereof on said first pivotal means for pivotal movement along said one end wall and limited

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pivotal movement transversely thereof; handle positioning means on said scoop adapted for engagement and disengagement with said handle through pivotal movement thereof transversely of said end wall; second pivotal means secured to the other end wall and projecting outwardly therefrom; another handle loosely supported at one end thereof on said second pivotal means for pivotal movement along said other end wall and limited pivotal movement transversely thereof; and other handle positioning means on said scoop adapted for engagement and disengagement with said other handle through pivotal movement thereof transversely of said other end wall; during normal operation of said device the other ends of said handles being in positions convenient for the operator to grasp with his hands, and said handle positioning means being in positions on the scoop for engagement with said handles when in said convenient positions, thereby enabling the operator to manipulate the scoop by its handles for loading, travelling or dumping.

2. A manually operated snow removing device comprising a snow receiving scoop adapted for sliding movement over snow and manipulation to loading, travelling and dumping positions by means of a pair of handles individually operable by an operator; said scoop having a bottom wall with a leading scraper edge thereon and a rear portion curving upward to become a curved rear wall; a pair of end walls joined to said bottom and rear walls to define therewith a scoop open at the front and top thereof; first pivotal means secured to one end wall in the mid upper portion thereof and projecting outwardly therefrom; a handle loosely supported at one end thereof on said first pivotal means for pivotal movement thereon along said one end wall and limited pivotal movement transversely thereof; handle positioning means on said end wall intermediate said first pivotal means and the upper portion of said rear wall, said positioning means having handle receiving notches adapted for engagement and disengagement with said handle through pivotal movement thereof transversely of said end wall; when disengaged from the notches said handle pivoting freely on said first pivotal means along said one end wall and when engaged with a notch said handle being locked to said scoop for movement thereof; a second pivotal means secured to the other end wall in the mid upper portion thereof and projecting outwardly therefrom; another handle loosely supported at one end thereof on said second pivotal means for pivotal movement thereon along said other end wall and limited pivotal movement transversely thereof; other handle positioning means on said other end wall intermediate said second pivotal means and the upper portion of said rear wall, said other positioning means having handle receiving notches adapted for engagement and disengagement with said other handle through pivotal movement thereof transversely of said other end wall; when disengaged from the notches said other handle pivoting freely on said second pivotal means along said other end wall and when engaged with a notch said other handle being locked to said scoop for movement thereof; the arrangement of handles and handle positioning means being such that an operator holding the other ends of the handles can manipulate the scoop by the handles for loading, travelling or dumping.

3. A manually operated snow removing device comprising a snow receiving scoop adapted for sliding movement over snow and manipulation to loading, travelling and dumping positions by means of a pair of handles individually operable by an operator; said scoop having a bottom wall with a leading scraper edge thereon and a rear portion curving upward to become a curved rear wall; a pair of end walls joined to said bottom and rear walls to define therewith a scoop open at the front and top thereof; a first bolt secured to one end wall in the

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mid upper portion thereof with its head and a shank portion projecting outwardly from the wall; a handle having a transverse aperture in one end thereof for pivotally supporting the handle on the shank of said first bolt for pivotal movement of the handle along said one end wall; said handle being a sufficiently loose fit on said first bolt to permit limited pivotal movement of said handle transversely of said one end wall; a handle positioning member on the outer side of said one end wall intermediate said first bolt and the upper portion of said rear wall, said member having spaced notches therein for receiving said handle for locking it to the scoop in each notch; a first brace secured to said one end wall by said first bolt and to said rear wall; a second bolt secured to the other end wall in the mid upper portion thereof with its head and a shank portion projecting outwardly from the wall; another handle having a transverse aperture in one end thereof for pivotally supporting the handle on the shank of said second bolt for pivotal movement of the handle along said other end wall, said other handle being a sufficiently loose fit on said second bolt to permit limited pivotal movement of said other handle transversely of said other end wall; another handle positioning member on the outer side of said other end wall intermediate said second bolt and the upper portion of said rear wall, said other member having spaced notches therein for receiving said other handle for locking it to the scoop in each notch; a second brace secured to said other end wall by said second bolt and to said rear wall; and an elastic member stretched between said handles for urging them toward each other, said elastic member being spaced a short distance from said scoop.

4. A manually operated snow removing device comprising a snow receiving scoop adapted for sliding movement over snow and manipulation to loading, travelling and dumping positions by means of a pair of handles individually operable by an operator; said scoop having a bottom wall with a leading scraper edge thereon and a rear portion curving upward to become a curved rear wall; a pair of end walls joined to said bottom and rear walls to define therewith a scoop open at the front and top thereof; a pair of handles for said scoop; means for pivotally securing one end of one handle to the outer side of one end wall and other means for pivotally securing one end of the other handle to the outer side of the other end wall such that each handle is supported for pivotal movement along and limited pivotal movement transversely of the end wall supporting the handle; and handle positioning means on the scoop for each handle, said positioning means being adapted for engagement and disengagement with the associated handle through said transverse pivotal movement thereof; during normal operation of said device the other ends of said handles being in positions convenient for the operator to grasp with his hands, and said handle positioning means being in positions on the scoop for engagement with said handles when in said convenient positions, thereby enabling the operator to manipulate the scoop by its handles for loading, travelling or dumping.

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