

E. ROGERS.  
Snow-Plows.

No. 151,916.

Patented June 9, 1874.

Fig. 1.

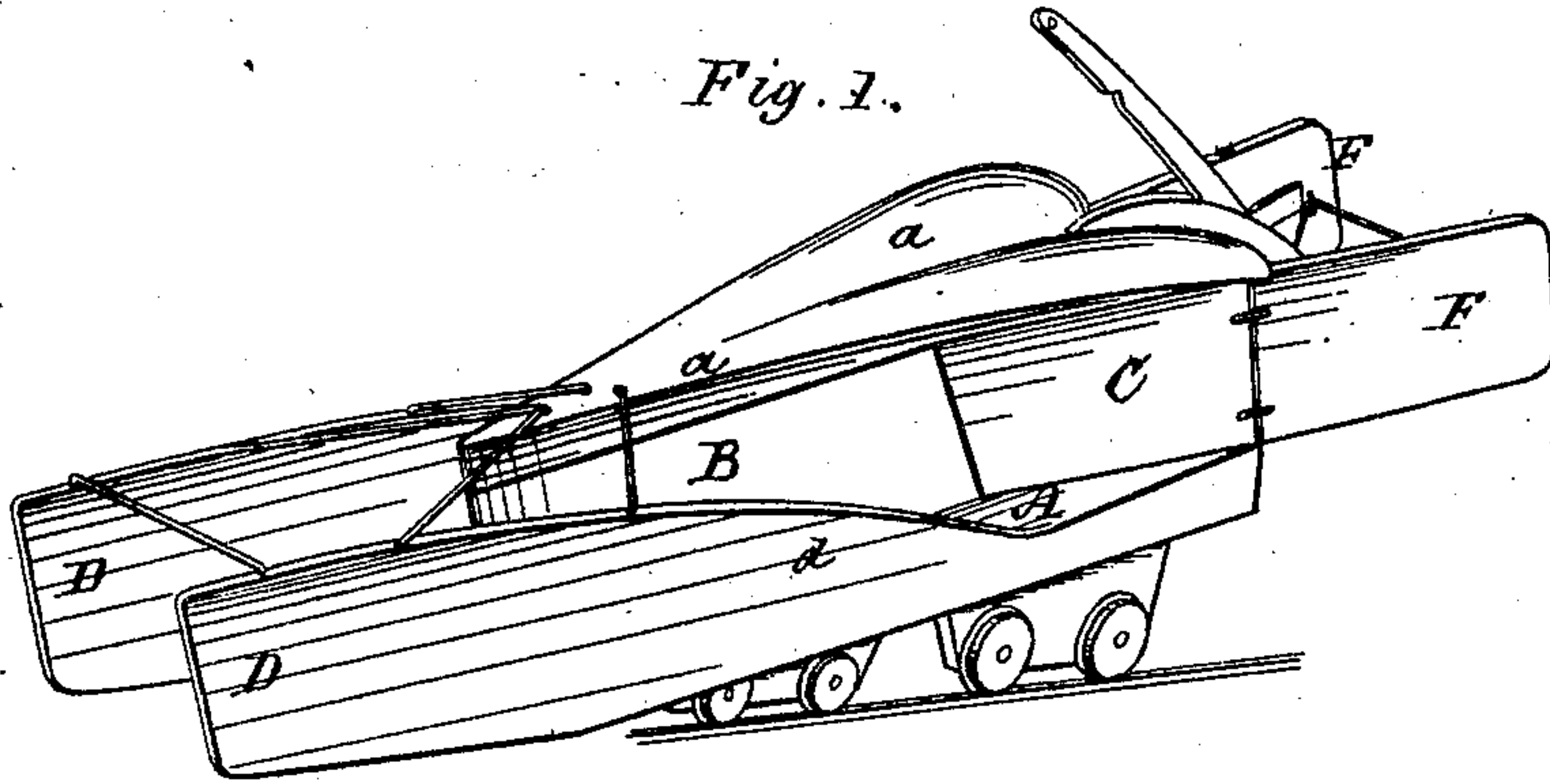


Fig. 2.

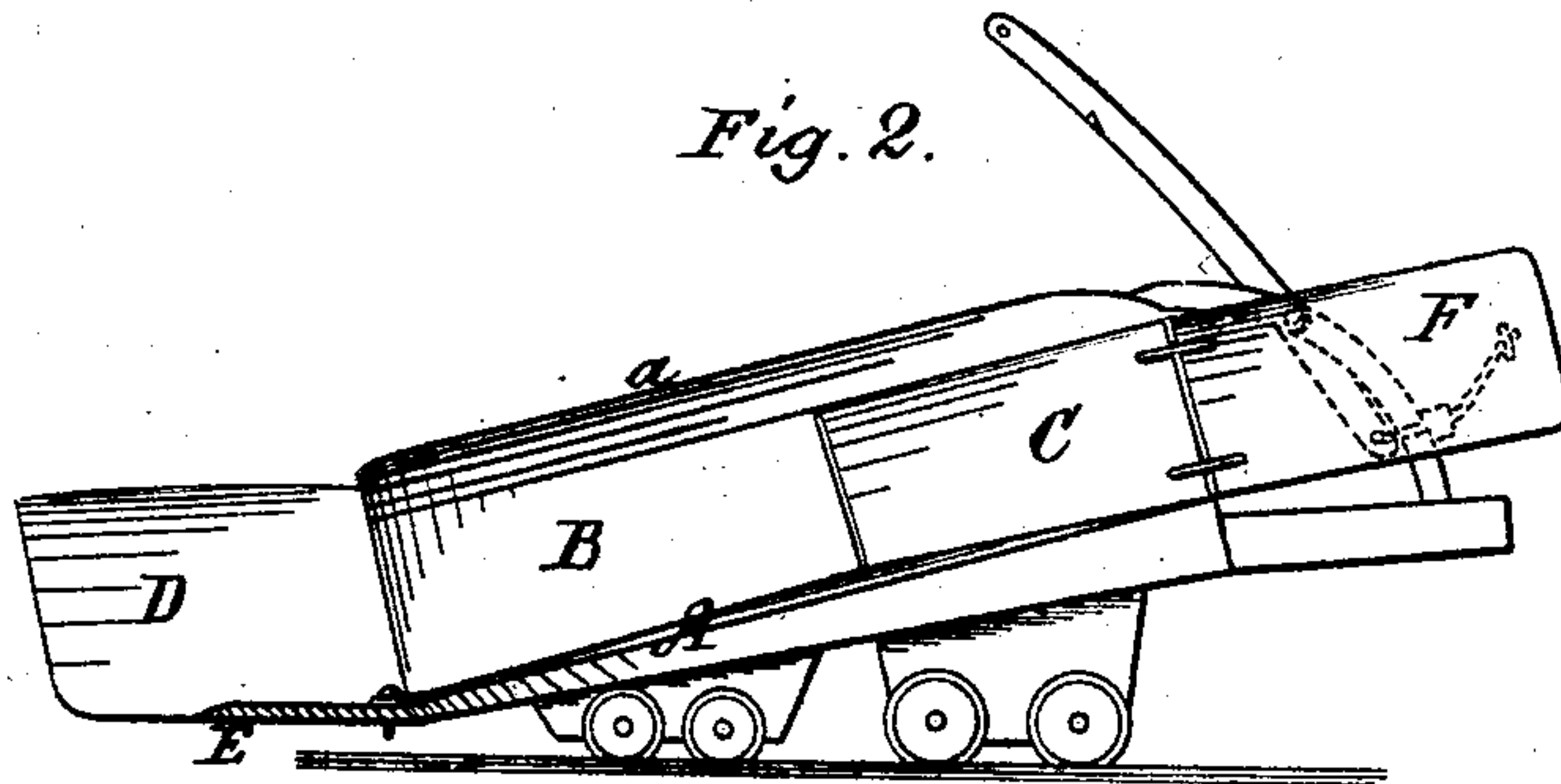


Fig. 3.

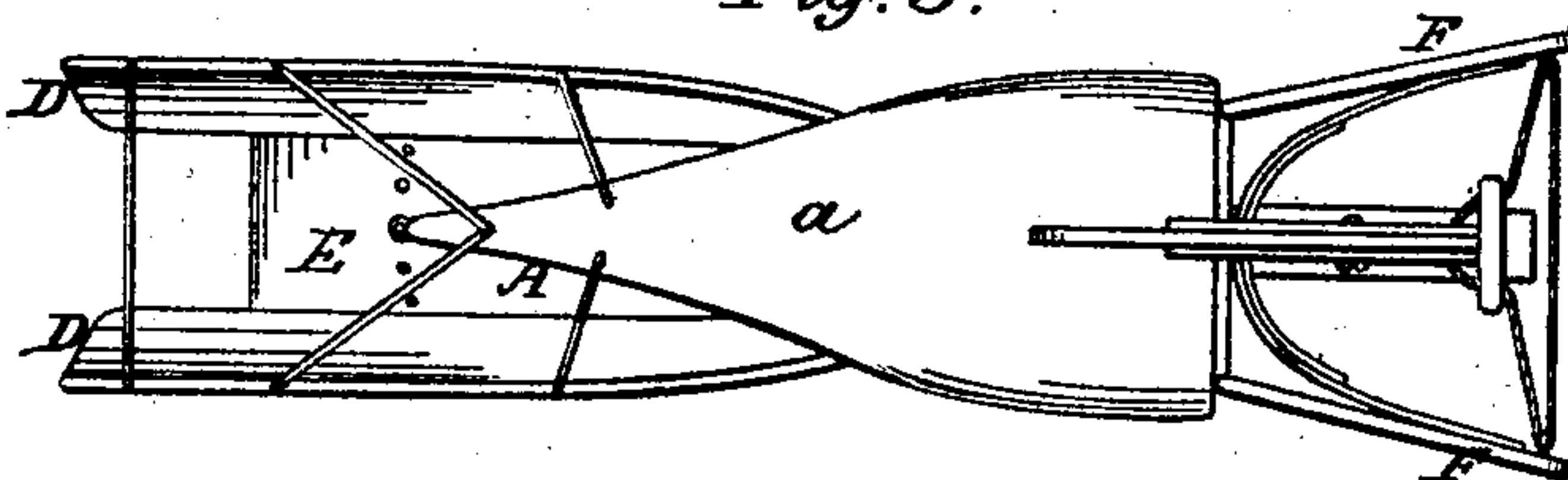


Fig. 4.

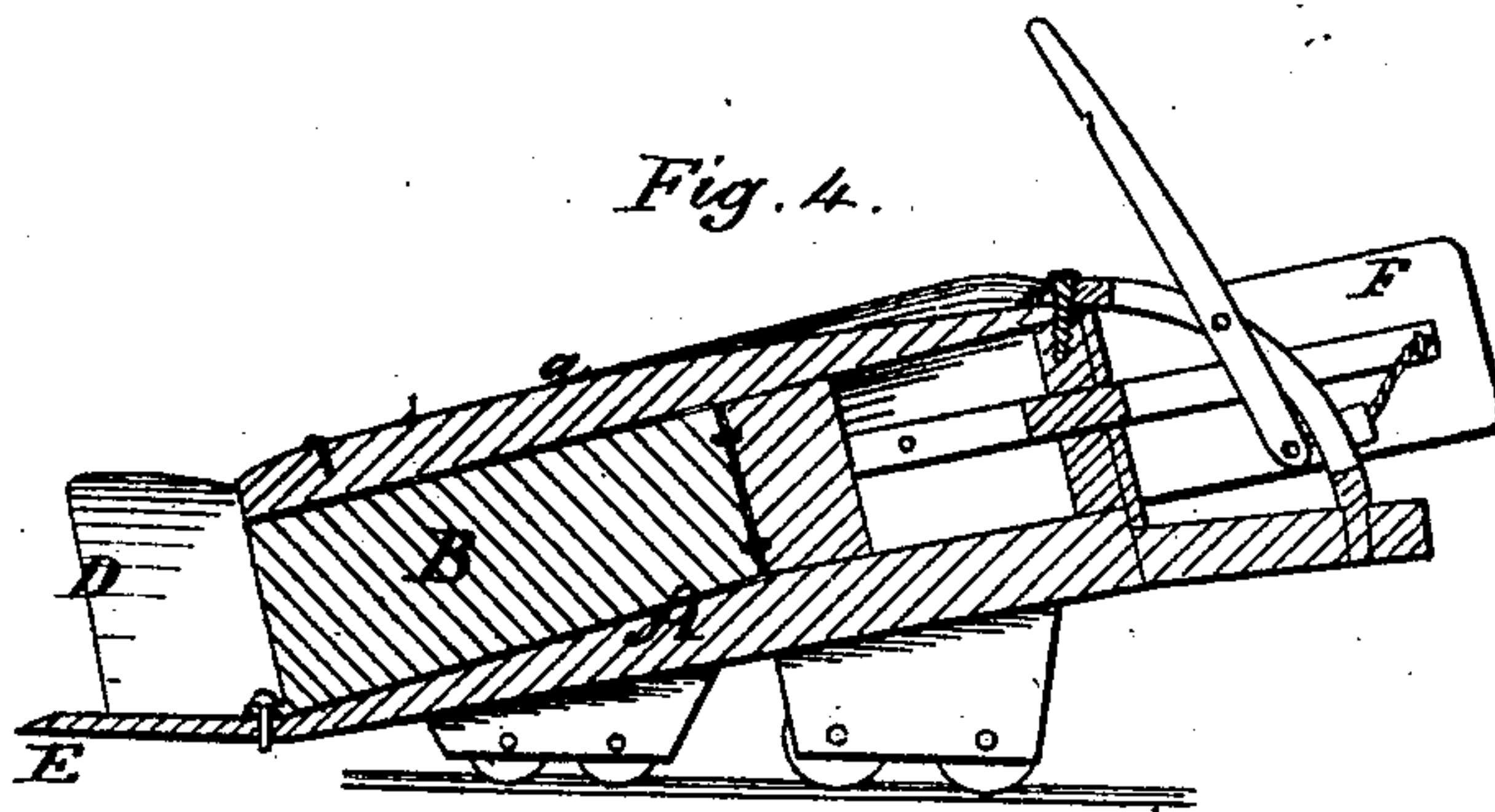
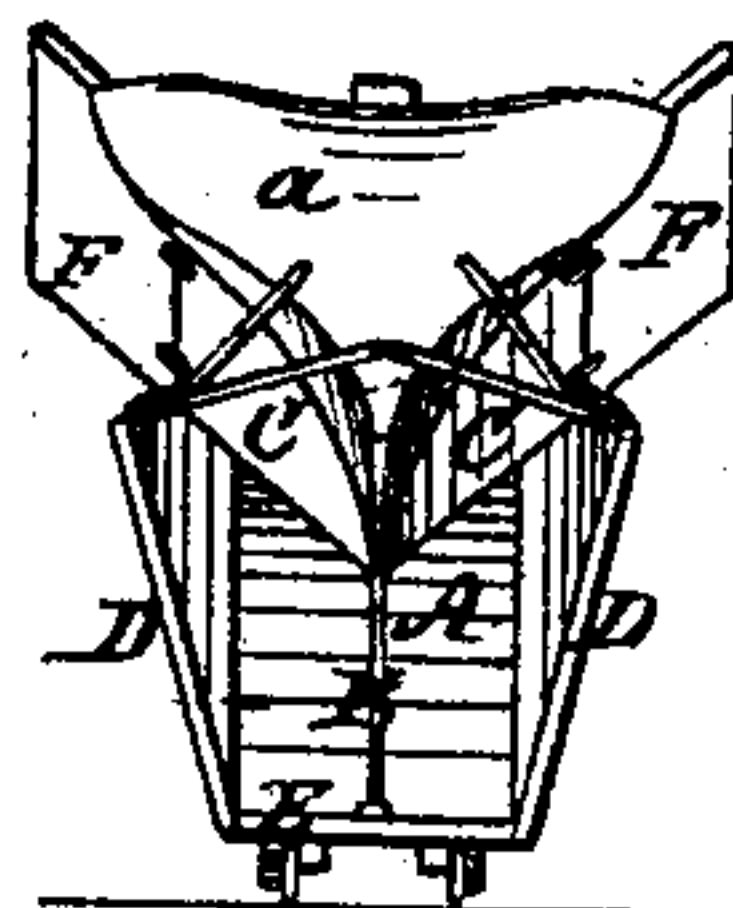


Fig. 5.



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# UNITED STATES PATENT OFFICE.

EZEKIEL ROGERS, OF NEW LONDON, CONNECTICUT.

## IMPROVEMENT IN SNOW-PLOWS.

Specification forming part of Letters Patent No. **151,916**, dated June 9, 1874; application filed April 4, 1873.

*To all whom it may concern:*

Be it known that I, EZEKIEL ROGERS, of New London, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Snow-Plows.

My improvements relate to that general class of railroad snow-plows which are provided with vertical cutters, inclined planes, and mold-boards. My invention consists partially in a novel combination, construction, and arrangement of the cutters and the inclined plane, whereby the mass of snow to be removed will be detached from the snow-bank, on one or both sides, in advance of the base of the inclined plane; and also in combining, with the cutters and inclined plane, a horizontal cutter and ground-plate, operating either in advance of the vertical cutters or between their edges and the base of the inclined plane, whereby the mass of snow to be moved will be detached from the ground adjacent to or on a level with or below the top surface of the rails; and, still further, in combining, with the mold-board, adjustable wings or clearers, whereby the snow, after being discharged on the top of the bank, may be pushed back from the cut, and thereby practically obviate the caving in of the sides of the cut; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear and true description of a snow-plow embodying the several features of my invention.

Referring to the drawings, Figure 1 represents in perspective one of my snow-plows. Fig. 2 represents the same in side view, with one of the side cutters removed. Fig. 3 represents the same in top view. Fig. 4 represents in longitudinal section a plow embodying my invention, but having a slightly different arrangement of the parts. Fig. 5 represents my snow-plow in front view.

My improved plow may be mounted on one four-wheeled truck, or on two trucks, as shown in the drawings.

A denotes the inclined plane; B, an adjustable vertical divider, and C the mold-board, none of which parts possess any special novelty. The inclined plane A extends from a

point as near the crown of the rails as it is practicable to have it, to a point above the level at which snows are apt to fall—say seldom if ever, at an elevation greater than five feet from the ground. The adjustable vertical separator B is hinged at its rear end to the front of the mold-board, and is provided with a flattened projecting lug at its front lower end, through which a holding pin may be dropped into one of several holes arranged on a curved line adjacent thereto on the inclined plane. By this arrangement the snow taken up may be equally or unequally divided, and thrown to the two sides, or all may be thrown to either side. The mold-board C on each side is or may be a straight-sided incline, or of the usual plowshare form. The mold-board and separator are surmounted by a cap, *a*, which so projects on either side as to prevent snow from flying back on the locomotive. D denotes, in each instance, a vertical cutter; its cutting-edge is placed far in advance of the front of the inclined plane. By being so located, the mass of snow to be removed is wholly separated from the bank before the plane can act thereon and pack it by the pressure necessary for the removal of the snow already in the plow. Extending from the rear end of the vertical cutters to a point adjacent to the front of the mold-board are side wings *d*, which serve to keep the mass of snow, while being elevated on the plane, from coming in contact with the vertical walls of the snow-bank. The vertical cutters may be placed with their edges in advance of the base of the inclined plane, at any distance varying from, say, twelve inches to six feet, with variable results. As a rule, the farther they are placed in advance, the easier can the plane take the snow, for the cut will then surely be made so far in advance of the snow, which is packed by the forward movement of the plow and the pressure of the snow already thereon, that its "lift" will be wholly free from contact with the sides of the bank, and at the point where the packed snow merges into the natural drift the vertical separation will be complete.

With plows as heretofore constructed, the snow is packed in advance, and to a greater or less extent it is made to hug the ground,



and, therefore, it has a tendency to continually lift or raise the nose of the plow. Although the effect is, to a valuable degree, lessened by placing the cutters so far in advance of the plane as to confine the lift and the pack to that portion of the snow actually to be removed, I have invented a means by which the packing in advance is practically obviated, which consists in a horizontal cutter or ground-plate, E, which is placed in advance of the base of plane A, and on line therewith, with its upper edge beveled downward, forming a chisel-shaped front, so that it will have a tendency to maintain the desired horizontal position. This horizontal cutter may have its chisel-edge at a point adjacent to the edges of the vertical cutters, or at some point between them and the base of the plane, and it will operate with variable effects, any of which will be superior to results which can be attained without its use.

It will always be preferable, however, in order to attain the most valuable results, that this horizontal cutter or ground-plate should extend beyond the plane so far that it will undermine and sustain the snow to be removed at a point beyond the pack, which, according to the depth of the snow, will vary from two to six feet. For ordinary usage the ground-plate need not extend more than, say, three or four feet beyond the base of the inclined plane. It will be seen that the operation of the cutter and ground-plate will be substantially the same, whether its edge be advanced beyond the edges of the vertical cutters or located between them and the inclined plane. In localities where deep snows are liable to occur it will be advisable to have the ground-plate extensible, even to a point slightly beyond the edges of the vertical cutters. It is to be noted that my aim is, as far as practicable, to separate the mass of snow to be removed from the drift and from the ground before it can be packed either horizontally or into closer relation with the track than it would naturally be in after falling naturally or drifting; and by this means the labor of lifting and discharging the mass is greatly lessened; for the plow is only obliged to force its way through loose snow, instead of snow which is packed, not only ahead, but also more or less at the sides of the cut.

Inasmuch as a vertical-sided bank or cut would be liable to cave if the mass of snow should be left near its edge, as would naturally be the case if the mold-board alone were employed, I have devised the clearers or wings F, which are hinged or pivoted to the rear of the mold-board at each side. These wings can be controlled by a lever, as shown, which, by acting on chains or cords, will contract the wings at their rear ends, and by the use of powerful springs of metal or wood they may be forced out to their extreme limits. As the snow deposited on the top of the bank will not be backed up at all it will not require much force to throw it out of the way. These

wings may each be made in two horizontal sections, so that the upper one will have a wider range than the lower, and thus effectually control unusual quantities of snow with greater ease than if the whole mass were moved back at once.

It will be observed that the vertical cutters are inclined outward somewhat from the base upward, in order that there may always be a tendency to a lift and a free clearance as the plow advances. The inclined plane at or near the front of the mold-board is considerably wider than at the cutters, and therefore no liability will occur for the snow to choke as it is passing or being lifted upward to the mold-board.

The wings or clearers F should have a retractile capacity sufficient to enable them to be readily withdrawn so far that they may fully clear the sides of narrow ways, as at bridges, &c.

Having thus described my invention, it is to be understood that I am well aware that inclined planes, mold-boards, and vertical cutters have been combined in snow-plows for many years, and that rotary cutters of various kinds have also been employed in combination with a spout-like structure, the bottom and sides of which were intended to serve as separators or cutters. I am not aware, however, of the existence, prior to my invention, of such a combination of these elements as would effect the successive operation of the vertical and horizontal cutters, the inclined plane, and the mold-board, as herein described; and

I therefore claim as new and desire to secure by Letters Patent—

1. The combination, in a snow-plow, of the inclined plane A and mold-board B C with vertical cutters D, which are placed in advance of the base of the inclined plane, whereby the mass of snow to be removed will be detached from the bank before it becomes packed by the forward movement of the plow, as and for the purposes specified.

2. The combination, in a snow-plow, of the vertical cutters D and a laterally and longitudinally horizontal cutter or ground-plate, E, both of which are placed with their cutting-edges in advance of the base of the inclined plane A, whereby the mass of snow to be removed will be detached from the bank at the sides and from the ground before said mass becomes packed by the forward movement of the plow, as and for the purposes specified.

3. In combination with the mold-board B C of a snow-plow, the adjustable expanding wings or clearers F, for throwing the snow beyond the range of the mold-board, and beyond the sides of the snow-cut on either or both sides of the plow, as and for the purposes specified.

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