April 10, 1928. 1,665,733

C. W. CLARK

SNOWPLOW

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Fig. 1.

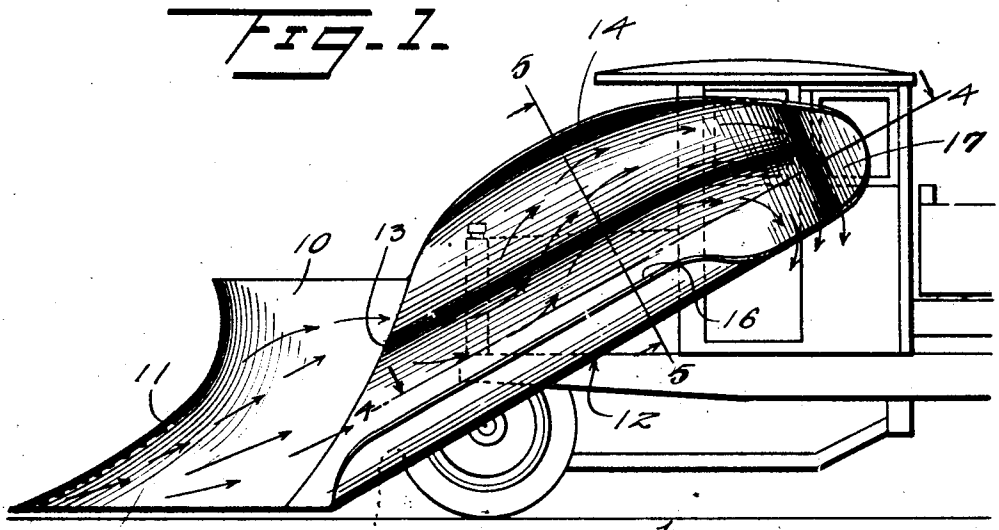
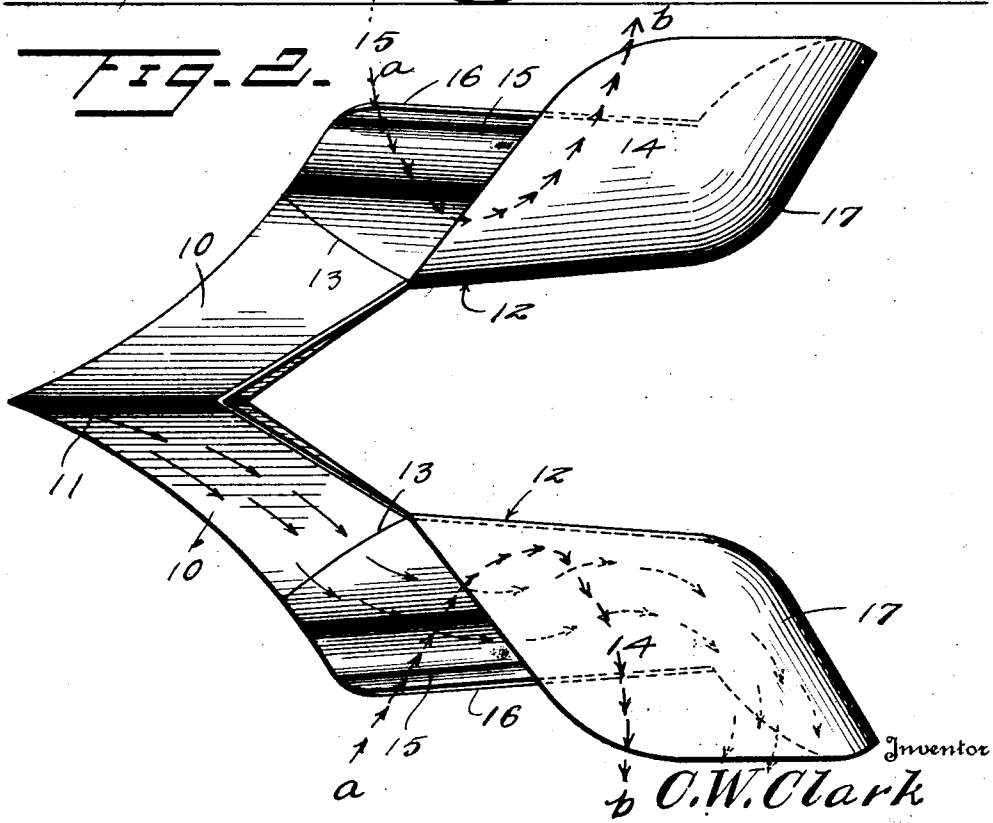


Fig. 2.



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Fig. 3.

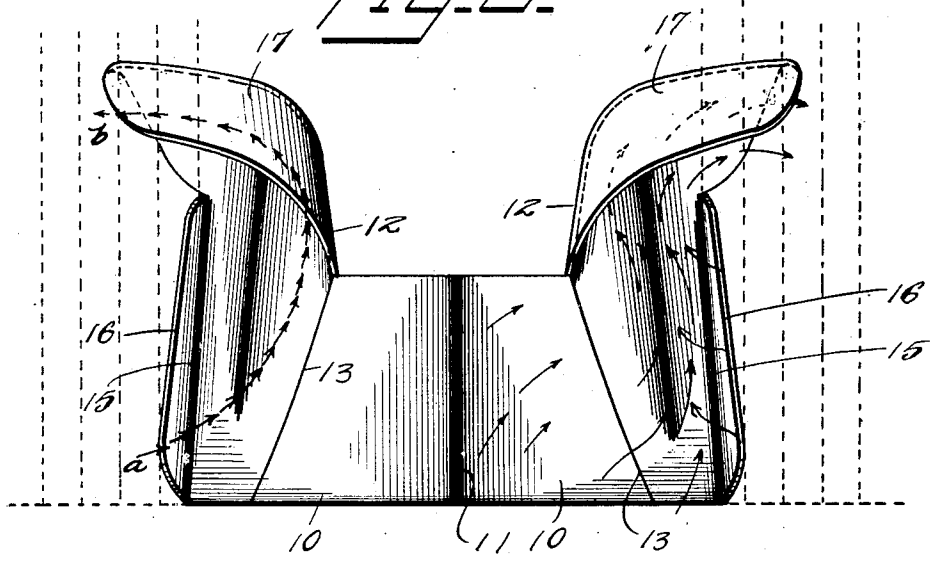


Fig. 4.

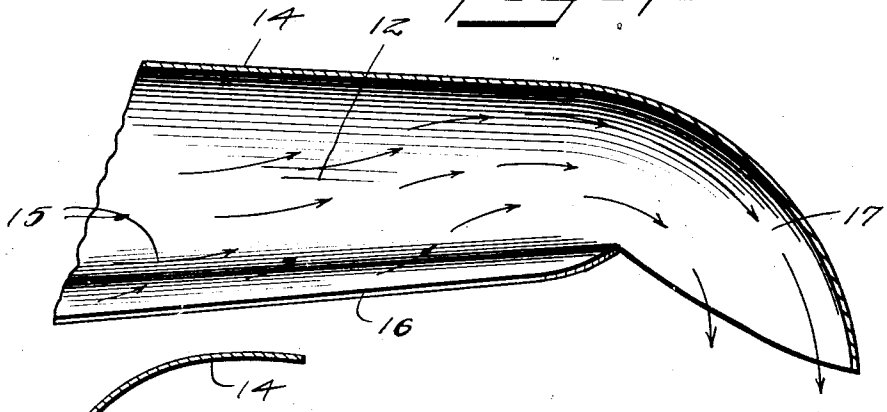
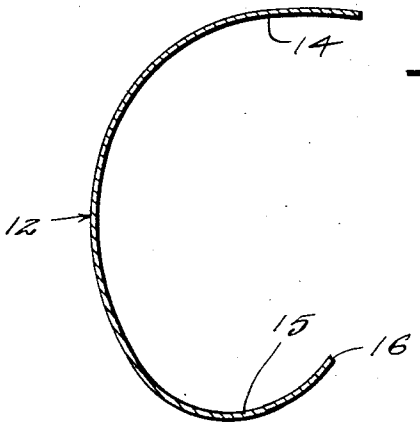


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SNOWPLOW.

Application filed February 12, 1927. Serial No. 167,804.

This invention relates to snow plows and particularly to the snow plows used for heavy snows and ordinarily mounted upon heavy and powerful high speed trucks.

The snow plows commonly used for clearing roads in heavy snows are approximately V-shaped in cross section horizontally and the two wings of the plow extend downward, forward and at an angle and act to carry the snow rearward and laterally to a height of approximately four feet and then throw or pack the snow upon or against a bank, the snow that passes over the mold boards or wings of the plow at their upper and outermost parts and fails to reach the top of the bank falling down into the road.

It is impossible to throw the snow to a height beyond the height of the mold board as the plow depends for its lifting of the snow upon the piling up of the snow against the side bank. Consequently, the weight of this snow and its friction against the side bank causes the plow to lose power and speed and thereby its snow throwing efficiency. This leaves the roadway cut by the plow with relatively vertical highly peaked banks caused by the plowed snow having barely reached the top of the bank, and if drifting occurs the character of this highly peaked bank causes the snow drifting over it to immediately fall into the narrow plowed roadway. In this case it is practically impossible to plow the road out with the form of plow described because the steep side banks prevent any fresh snow from being forced laterally into or on top the banks, and continued drifting blocks road for travel. This being the case, it is necessary to use a rotary snow plow mounted upon a high powered tractor, and having screw-like cutting blades in order to remove the snow, and this is relatively slow and expensive operation.

With these facts in mind, it is my object to provide a snow plow for public use designed to be mounted upon a high speed truck or other powerful propelling machine, the snow plow being provided with the rearwardly divergent, upwardly inclined mold boards, and with transversely curved chutes or trough-like extensions merging into the rear edge of each mold board and extending rearward and upward and somewhat laterally, these wings in cross section being so curved as to provide an over-arching hood at the top of the wing and provide an upwardly and outwardly curved, rearwardly and upwardly extending cutting edge at the outer edge of the chute to thus act to receive the snow as it leaves the mold board and deflect it upward and transversely around said hood and shoot it out laterally to a point some distance above the snow bank to thus throw the snow outward away from the road and prevent the packing of the snow against a snow bank as is the case where an ordinary snow plow is used.

The object in providing a cutting edge or blade 16 on the outer margin of the chute 15 is that by the fact that it flares outward and merges into the transverse curvature of the wing it causes a transverse impetus to be given to the snow cut by itself and to the snow received by the chute from the mold board. This cutting edge or blade further acts to cut slices or sections from a side snow bank to thus increase the width of the path made through the snow to the full width of the traveled roadway, the forward motion of the plow causing this transversely impelled snow so cut off to pass spirally rearward and upward and be discharged by the hood or overhanging portion 14 laterally at practically right angles to the path of the plow from the under surface of the hooded portion 14 at its outer and lateral margin and to fall widely away from the edge of the cut made by the plow.

A further object of the invention is to provide a construction of this character, which enables the use of a plow, the mold boards of which are more sharply converging than in the ordinary construction. With the ordinary plow construction, if the mold boards are sharply converged, in order that the plow may have the necessary width, it is necessary that the plow point be arranged at a considerable distance in advance of the truck. This renders operation and handling of the plow extremely difficult. With the present construction, the sharply converging mold board faces may be employed and at the same time, by the addition of the width of the chutes the plow given the desired width without attenuating the plow or extending the same an unreasonable distance in ad-

vance of the truck. Thus the advantage of ready penetration is maintained without the disadvantages attending this structure when employed in the usual manner.

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

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a snow plow constructed in accordance with my invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a front elevation;

Fig. 4 is a fragmentary section on the line 4—4 of Figure 1;

Fig. 5 is a section on the line 5—5 of Figure 1.

Referring to these drawings, it will be seen that the plow consists of the mold boards 10. Each of these mold boards is disposed in an upward and rearward and laterally extending plane, the profile of the front edge of the plow being inwardly curved so as to provide a nose 11 extending out considerably in advance of the body of the plow. An ordinary plow may be employed, if the mold boards thereof are drawn together at their rear ends, so that they converge more sharply than in the original structure.

Attached to the mold boards 10 in any suitable manner, as by welding or otherwise, are two wings. Each wing 12 consists of a sheet or plate of metal formed in any suitable manner and joined to the rear edge of each mold board along the line 13. Each wing 12 extends upward and rearward from the rear edge of the mold board to thus form a chute, as it may be termed, which, as illustrated in Figure 5, is curved in cross section so as to provide a hood portion 14 arching over the chute and an upwardly and outwardly inclined portion 15 having a shearing or cutting edge 16, this shearing or cutting edge extending straight backward and upward at an inclination. The upper end of each chute is curved laterally, as at 17, (see Figure 4). The lower end of the chute terminates even with the rear end of the corresponding mold board.

The plow commonly used in connection with an engine driven vehicle is open to the objections previously stated. With the addition or provision of these wings 12, however, a very much improved result is secured for the reason that the sharply converging plow point may readily penetrate the snow and the snow divided by the mold boards and thrust laterally towards the sides of the cut is discharged, as shown by the arrows, into the lower end of the chute 12 and carried spirally up this chute and discharged transversely from the under surface of the hood or upper wall of the chute 14 at its lateral margin and almost at right angles to the longitudinal axis of the chute and any snow that passes up to the rear end of the chute is discharged laterally by the curved ends 17 thereof at a height of between seven and nine feet above the bed of the roadway, the speed of the truck being such that the snow is impelled a considerable distance laterally and will fall widely beyond the edge of the cut made by the plow. The cutting edge 16 will act to shear and slice sections from the wall of the cut and the road may be plowed several times so that each time the wall is cut, as shown in dotted lines in Figure 3, each slice, as it may be termed, will be cast outward and laterally widely beyond the path of the plow. Thus the cut may be widened as desired which is not possible where an ordinary plow is used, for the reason that the plow simply packs the snow in the first instance to form a wall and after that no further packing will force this wall inward or remove the snow therefrom. It is to be particularly noted that the snow cut by the cutting edge 16, due to the outward flaring angle and the position of the blade 16 is given a powerful drive into and across the chute, and, following the internal transverse curvature of the chute, is then carried spirally upward and rearward and discharged laterally from the lateral edge of the hooded portion 14; also from hooded laterally curved end 17. As shown by the arrows *a*—*b* in Figures 2 and 3, the snow cut by the edges 16 is caused to rotate quickly within the trough and to be discharged over the outer edge of the trough, as shown by the arrows, and this quick rotation of the snow so speeds up the discharge that the capacity of the chute to take care of deep snow is very much added to.

I do not wish to be limited to any particular means for supporting this plow upon a truck as any suitable framing for this purpose may be used, nor do I wish to be limited to the particular manner of forming the plow and the wings 12 or jointing these wings to a previously formed plow, the mold boards of which have been drawn together.

It will be seen that I have provided side chutes, each of which in cross section is irregularly circular or, generally speaking, spiral, these chutes being disposed in connection with a snow plow mold board, each chute having a vertical depth from the bottom 15 to the top wall 14 approximately equal to the height of the mold board of the plow. The side chute is not a part of the mold board but an addition to the mold board attached and operating at a lower angle of inclination than the angle of inclination of the mold board and the chutes being less divergent than the mold boards are. These chutes secure their efficiency due to their circular form. If the chutes were not circular and the transverse curvature was

not continuous, there would be an impediment to the upward movement of the snow over the inner curved surfaces of the chutes and the discharge of the snow laterally outward from the edge of the portion 14.

It will thus be seen that the curvature of the chutes is important and it will be seen that the hood 14, the transversely curved ends 17, and the side cutting edge 10 each is one element in securing complete efficiency. A foot of snow on a highway does not constitute a formidable snow problem, as the ordinary snow plow driven by a heavy truck will readily remove it, but when this snow is divided in the center of the roadway and pushed to either side it forms a side bank two or three feet high. The plow then attacks one side to further widen the roadway and on the return trip attacks the other side in the same way. Even in a northern country it is seldom that more than three feet of snow falls during the winter. If this should come in three falls of one foot each, three round trips of the snow plow would seem to be only necessary in order to keep the road open for the winter, but this is far from being the case, as the road requires daily plowing and often requires to be plowed day and night in order to keep the drifting snow plowed out. With this alternate drifting and plowing the side bank is constantly growing higher. This side bank which has been crowded to and piled or banked at the immediate edge of the roadway with continued plowing and drifting is gradually built toward the center of the road by banking the drifting snow inside the bank formed until these opposite banks approach each other to such a degree that only the width of the plow is left between them. Then these banks must be again plowed by heavy tractor plows, necessarily slow and expensive.

With a plow having my improved side chutes no bank would have been initially formed. The snow would have been forced laterally in the ditch and the bank would have been formed at this point and drifting would have occurred there and very little plowing would have been required at all. After a bank is formed on each side of the narrow roadway, this bank becomes very solidly frozen and in order to cut this snow the side cutting blade 16 is required. This blade cuts this hard crusted snow very readily due to its angle of slope, entering the snow with a sliding motion and the slice thus cut out is not milled or pulverized as is snow handled by a V plow, and consequently when it leaves its point of discharge it is in lumps or chunks and is more readily thrown by the impetus given to it in its spiral movement around the chute and its discharge therefrom, especially against a wind.

My plow permits plowing close to a guard rail, a mail box, fence or hedge, as the snow is cut cleanly and closely and is discharged beyond rather than into or on top of the rail, the fence or the hedge, as would be the case where merely a mold board is used. Attention is particularly called to the fact that where side chutes such as I have devised are employed in connection with a snow plow, there is a counterbalancing of forces whereby side draft is eliminated. The side cutting edge 16 with the curvature given to it and its rearward and inward slope has a tendency to guide the plow into and toward the bank, and opposing this force is the long slope of the mold board which tends to steer the plow away from the bank. These two opposing forces have a self-guiding effect on steering the plow so as to secure the highest efficiency. The side chute which I have described is not a mere conveyor to carry the snow upward and discharge it laterally from the top of the conveyor with slight force but when used in deep snow with a powerful motor behind it the snow, as before remarked, is caused to spiral upward and around the curved hood 14 and is discharged laterally with great force.

I claim:—

1. A snow plow having rearwardly divergent, upwardly and rearwardly inclined mold boards and chutes extending upward and rearward from the rear edges of the mold boards, the bottom and inner wall of each chute for substantially the entire length of the chute being curved transversely so as to provide a hood extending over and forming a continuation of the chute and the rear end wall of each chute being laterally curved.

2. A snow plow having rearwardly divergent, upwardly and rearwardly inclined mold boards and chutes extending upward and rearward from the rear edges of the mold boards, the bottom and inner wall of each chute being transversely curved for substantially the entire length of the chute so as to provide a hood extending over the chute and the rear end wall of each chute being laterally curved, the outer margin of each chute being curved upward and outward to provide an upwardly and rearwardly extending shearing edge terminating short of the upper end of each chute and merging thereinto.

3. The combination with a snow plow, of mold boards disposed in divergently angled relation, each mold board being upwardly and rearwardly inclined, of chutes, one for each mold board extending from the rear edges thereof and merging thereinto, each chute being curved transversely to provide an upwardly and laterally arching hood extending substantially the entire length of the chute and an upwardly and outwardly

curved cutting edge below the hood, the rear end of the chute being curved laterally and upwardly, the entire length of each chute having a height substantially equal to the height of the mold board and the upper end of each chute being disposed above the upper edge of the mold board, each chute gradually contracting in width towards its upper end.

4. A snow plow having mold boards extending upwardly and rearwardly and gradually diverging from each other, and chutes extending upwardly and rearwardly from the rear edges of the mold boards and diverging from each other at a less angle than the divergence of the mold boards and extending upward at a greater angle than the angle of the mold boards, each chute being transversely curved, each chute being formed to provide a cutting blade upon its outer margin and the inner wall of the chute being extended upward and laterally outward in a curve continuous with the curvature of the bottom of the chute to thereby provide a snow discharging hood, the rear end wall of the chute being curved laterally outward.

In testimony whereof I hereunto affix my signature.

CLARENCE W. CLARK.