March 28, 1939. P. ROUGIER 2,152,092

SNOW PLOW

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Fig. 1.

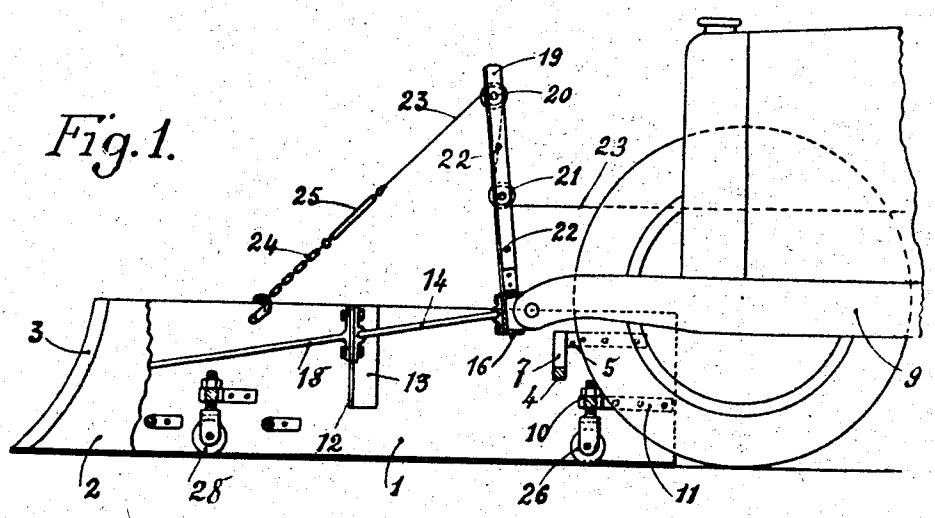
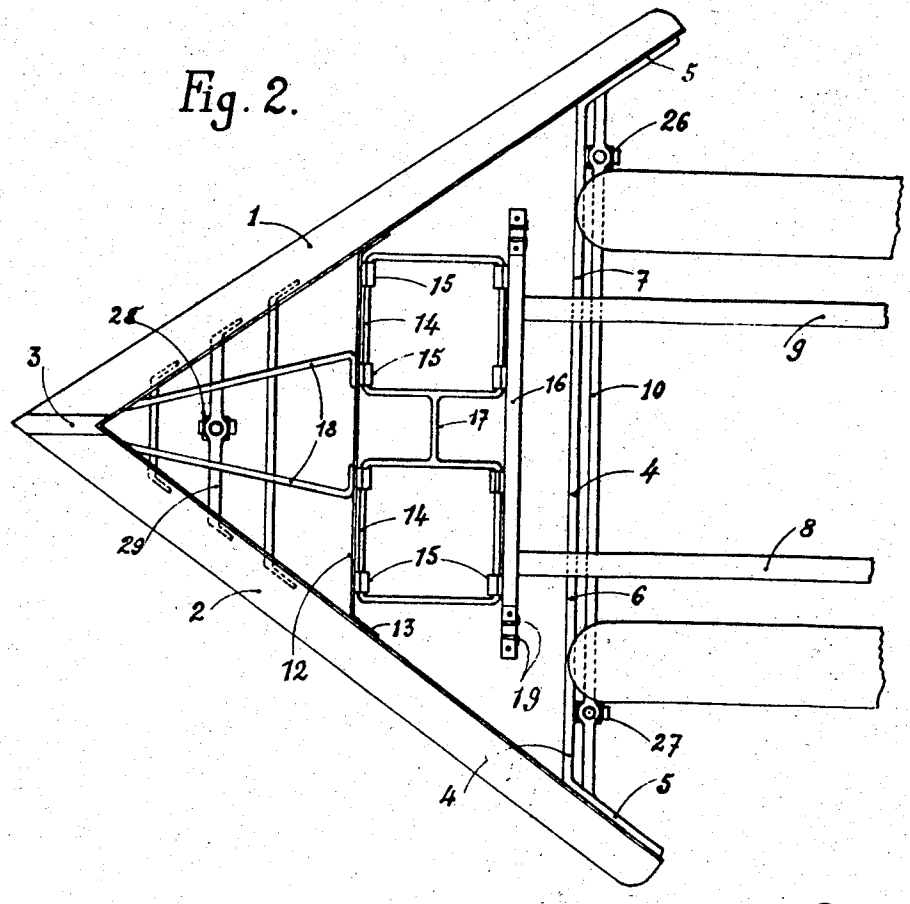


Fig. 2.



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Fig. 3.

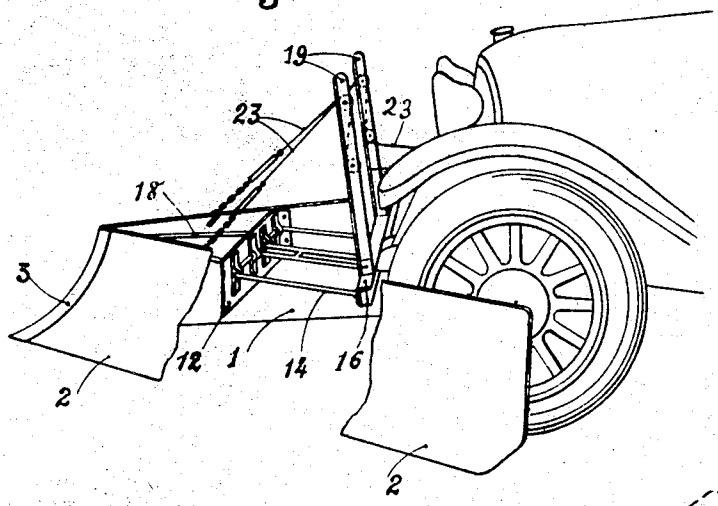
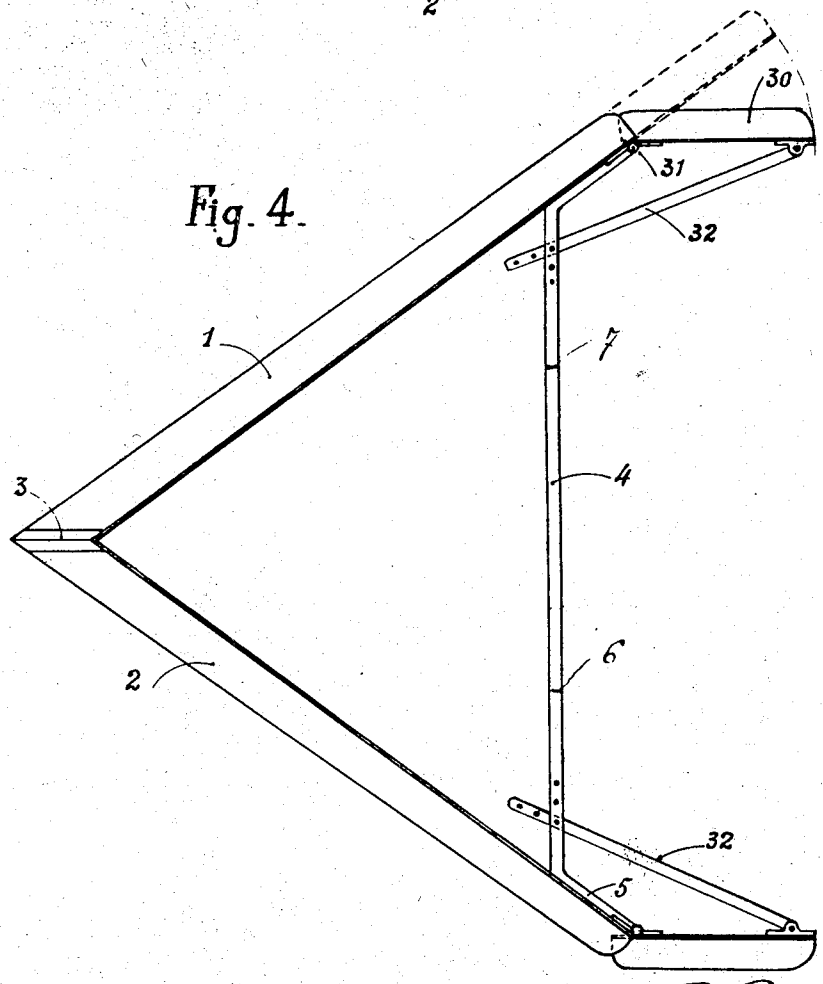


Fig. 4.



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UNITED STATES PATENT OFFICE

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SNOW PLOW

Pierre Rougier, La Courtine, Creuse, France

Application October 8, 1936, Serial No. 104,687
In Austria October 8, 1934

3 Claims. (Cl. 37—44)

Snowplows have already been designed in the form of two plowshares attached together in V-shaped arrangement, with the point to the front, and fixed to the fore-end of an automobile tractor.

If a snowplow is to be in accordance with the practical requirements of road-users, it must be able to sweep off the snow at a sufficiently rapid rate for such sweeping not to be excessively expensive.

In order to obtain the maximum speed from a snowplow the latter must be so designed that when the lower edges of the plowshares strike irregularities in the road surface, the raising of the plow portion should not prevent the front wheels of the tractor from getting a grip of the ground, for a lack of proper adherence is liable to reduce the speed of the snowplow considerably in comparison with that which could be obtained on a road sufficiently smooth for the lower edges of the plowshares not to meet any such irregularities.

Undoubtedly, it is always possible to prevent the lower edges of the shares hitting the irregularities of the road surface, by raising them sufficiently high above the road, but this is naturally not a satisfactory solution, for the plow would leave a thicker coating of snow on the road than the highest irregularities of surface and the road would still remain blocked to traffic.

Another essential condition, if the snowplow is to travel at the highest possible speed, is for it to be held firmly in the forward line of travel of the tractor, so as not to sway from side to side.

In order, therefore, for a snowplow to give satisfaction, it must possess all the following characteristics: (1) the bottom of the plowshares must be set as close as possible to the road surface; (2) the plow must be arranged to lift up, when the lower edges of the shares meet surface irregularities, without however interfering with the grip of the front wheels of the tractor on the road; (3) side-sway of the plow must be eliminated; (4) the plow must be readily attachable and removable.

The snowplow according to the invention fulfils all these requirements. Primarily, it is carried on three wheels, preferably pivoted, which result in a far smaller speed loss, than if runners are used. Moreover, as the plow is held up by a cable, it bears as lightly as possible on these wheels. When one of the wheels drops into a pot-hole, the plowshares cannot strike the ground, for the plow is held up by the cable. The invention is, however, particularly efficient when the lower edges of the plowshares strike bumps or irregularities in the road surface. When the plow comes into contact with an obstacle, in service, the front tends to tilt up, but this tendency is compensated by the double-jointed framework with which the plow is equipped. When the nose of the plow rises, the plowshare assembly revolves about the front bar of the double frame-work; immediately afterwards, the rear bar of the double frame-work revolves in the rear hinge staples. The co-ordinated movement of the double frame-work prevents the rear end of the plowshares from hitting the ground. In this way, no loss of speed occurs when the plowshares come in contact with an obstacle.

Similarly, the arrangement which consists in locating the hinge staples right up against the side bars of the frames prevents sway from developing in the plow and eliminates another cause of diminished speed.

Hence, the combination of supporting cable, carrying wheels and double framework enables the front wheels of the tractor to be permanently kept down to the ground, with the result that the snowplow removes the greatest possible volume of snow at an extremely high speed. Moreover, the snowplow may be attached to any type of tractor without requiring any change in design. Besides, the assembly of the plow attachment to the tractor can be carried out in a very short space of time, for it only requires the adjustment of two collars and the tightening of four bolts.

The snowplow, according to the invention, consists of two plowshares connected together so as to form a V-shaped nose in front of the tractor. It is characterized by the fact that it is fitted with two frames strutted together, the front bars of which are held in two hinge staples fixed to a cross member intended to be assembled to the front ends of the tractor chassis members, the hinge staples being placed in such a way as to eliminate any side-sway of the plow, so that, when the lowered edges of the plowshares strike an obstacle, the double frame-work revolves in the hinge staples and the whole plow attachment tilts up without allowing the grip of the tractor front wheels to be interfered with. Moreover, as the snowplow is not subject to side-sway, it is possible to drive it forward at the maximum speed of the tractor.

The attached drawings show, for instance, two methods of constructing a snowplow according to the invention:

Fig. 1 is a partial vertical cross-section through the middle of the snowplow.

Fig. 2 shows the plow in plan.

Fig. 3 is a perspective view of the snowplow attached to a tractor.

Fig. 4 shows another manner of carrying out the invention.

The plowshares 1 and 2, shaped like an agricultural plow mold-board, are attached together, preferably by welding. An angle iron 3 is fixed above the weld, advantageously by three bolts. A square strut 4 is bent at either end 5, so as to reinforce the plowshares 1 and 2. The strut 4 is bent down from 6 to 7, so as to allow the tractor chassis members 8 and 9 to pass over it. Another bar 10, likewise bent at either end 11, is bolted to the plowshares 1 and 2 underneath the strut 4. A plate 12, bent at either end 13, holds the plowshares 1 and 2 rigidly at the proper distance apart. Two round-bar frames 14 are assembled to the plate 12, by means of hinge staples 15, the tongues of which are bolted to the plate 12. At the other end, each of the frame 14 is assembled to the cross member 16, by means of similar hinge staples 15. In order to avoid any side-sway of the plow, the eight hinge staples 15 are all bolted up to the side bars of the frames, one to each side bar. The whole assembly consisting of the plowshares 1 and 2, the plate 12 and the two frames 14 is free to oscillate vertically about the cross member 16, thereby allowing the plowshares 1 and 2 to be raised or lowered above the ground level. The two frames are advantageously fixed together by means of the strut 17. The plate 12 is held rigid, preferably by means of the struts 18 bolted to the plate 12 and to the plowshares 1 and 2. Two angle iron uprights 19 are bolted at either end of the cross member 16, to carry the two pulleys 20 and 21, the shafts of which provide struts for the uprights, in addition, preferably, to the round bar struts 22. A cable 23, fitted advantageously with a chain 24 and a turnbuckle 25, passes over the pulley 20 and under the pulley 21 and is fastened to an eye bolt fixed to the corresponding side of the chassis member or to the tractor. The chain 24 is atached to a hook in the corresponding plowshares. The turnbuckle enables the cable to be shortened and the plow to be held at the required height above the ground. Wheels, adjustable in height and pivoted, are located advantageously: two of them, 26 and 27, under the bar 10 and one, 28, under a strut 29, and enable the plowshares 1 and 2 to be raised the necessary height above the irregularities of the road surface, so as to prevent them from scraping and thus to eliminate wear.

The snowplow is fitted to the tractor by attaching the cross member by two collars to the chassis members 8 and 9. If the chassis members are not long enough, the cross member 16 may be fixed to the bumper.

In order to use the snowplow, according to the invention, it is merely necessary to adjust the height of the plowshares above the road surface, according to the evenness of the latter, by means of the chain 24, the turnbuckle 25 and the wheels 26, 27 and 28. When the tractor to which it is attached is driven forward, the snow is thrown off to right and left without banking up, with the result that the driver sees clearly the road he is following. Moreover, the wheels of the tractor travel on a road surface which is practically free from snow. This is why it is possible to work at a much higher speed than if the tractor has to pass over the snow first.

In the course of tests carried out with a 13 H. P. inside drive automobile, a speed of 22 miles per hour was attained through a 16-inch snowdrift.

In order to obtain this high speed, without any fear of snow swirls blinding the driver, the plate 12 is cut short before reaching the lower edge of the plowshares and does not reach right down to the road level. In this way, the snow is not thrown up against this plate 12 and does not whirl up in front of the driver's eyes.

The plowshares are shaped like the mold-boards of an agricultural plow, the tail ends of which are turned back 6 inches inside the plow at their upper edge. Moreover the plowshares are 6 to 8 inches higher at the back than at the front, so as to prevent the snow swirling up in front of the driver and preventing him from seeing properly.

According to the form of construction shown in Fig. 4, the plowshares 1 and 2 are fitted with adjustable shutters 30, pivoting on hinges 31. These adjustable shutters are opened in service to the required degree according to the width of the road to be cleared and also to the thickness of the snowdrift, by means of a tie-rod or better still a rack 32, which is fastened at one end to the shutter 30 and at the other to the corresponding plowshare or to the strut 4.

The chief advantages of the snowplow according to this invention are as follows:

Its construction is extremely simple, despite its absolute rigidity. The simplicity of its construction makes the production cost price far lower than that of the snowplows in current use.

The double jointing or hinging of the front and rear bars of the double framework enable the plowshares to rise without interfering with the tractive grip of the drive wheels of the tractor, so that when the plowshares come into contact with an obstacle, their rear end does not hit the ground and consequently the tractor does not ride up on them. As the grip of the wheels on the road surface remains constant, there is no loss in speed.

The hinge staples being driven up against the side-bars of the frames, it is impossible for the frames to travel from side to side thus eliminating any tendency of the plow itself to side-sway. This arrangement suppresses a serious source of damage to both the snowplow and the tractor. It enables at the same time maximum speed to be got out of the tractor without any danger of damaging the snowplow.

To enable the hinge staples 15 to be accurately driven up to the side-bars, they may be provided with any convenient means of adjustment, or else be fitted with a lug bearing on the corresponding side-bar.

Numerous detail changes may be applied to the design of the snowplow according to the invention, without modifying the principle of same. For instance the lower edges of the plowshares might be reinforced advantageously by solid half-round bars, easily interchangeable in case of wear. Moreover, the two frames might be replaced by a single frame strutted sufficiently to avoid any possibility of deformation and to eliminate any side-sway of the plowshares. Likewise, the member of hinge staples might be altered.

What I claim is:

1. A snowplow consisting of two plowshares at-

tached together to form a nose and adapted to be attached to the front part of a tractor comprising, a longitudinal strut secured to each plowshare on the nose of the snowplow and having the other end fixed to an upright plate, four bearings carried by said plate, a frame having a side thereof mounted in two of said bearings, another frame mounted in the other two bearings, means connecting said frames, the opposite sides of said frames passing through four additional bearings which are mounted on a beam secured transversely to the frame of the tractor so that when one of the plowshares of the snowplow comes in contact with an obstacle the double frame rotates in said bearings whereby the snowplow is maintained in a horizontal position.

2. A snowplow according to claim 1 characterized by arranging the bearings in such a manner that one end of each bearing is close to the longitudinal sides of the frames and presses against each side of the frame to prevent sideway of the snowplow.

3. A snowplow according to claim 1 characterized by the fact that the cross-beam carries on each of its ends two angle iron uprights on which pulleys are mounted, a cable passing over said pulleys and secured at one end to the tractor, a turnbuckle fixed to the other end of said cable, means connecting the other end of said turnbuckle to the plowshares, whereby the snowplow can be held at any desired height above the ground by means of the turnbuckle.

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