March 26, 1940. W. E. KLAUER 2,194,662

SNOW REMOVING MECHANISM

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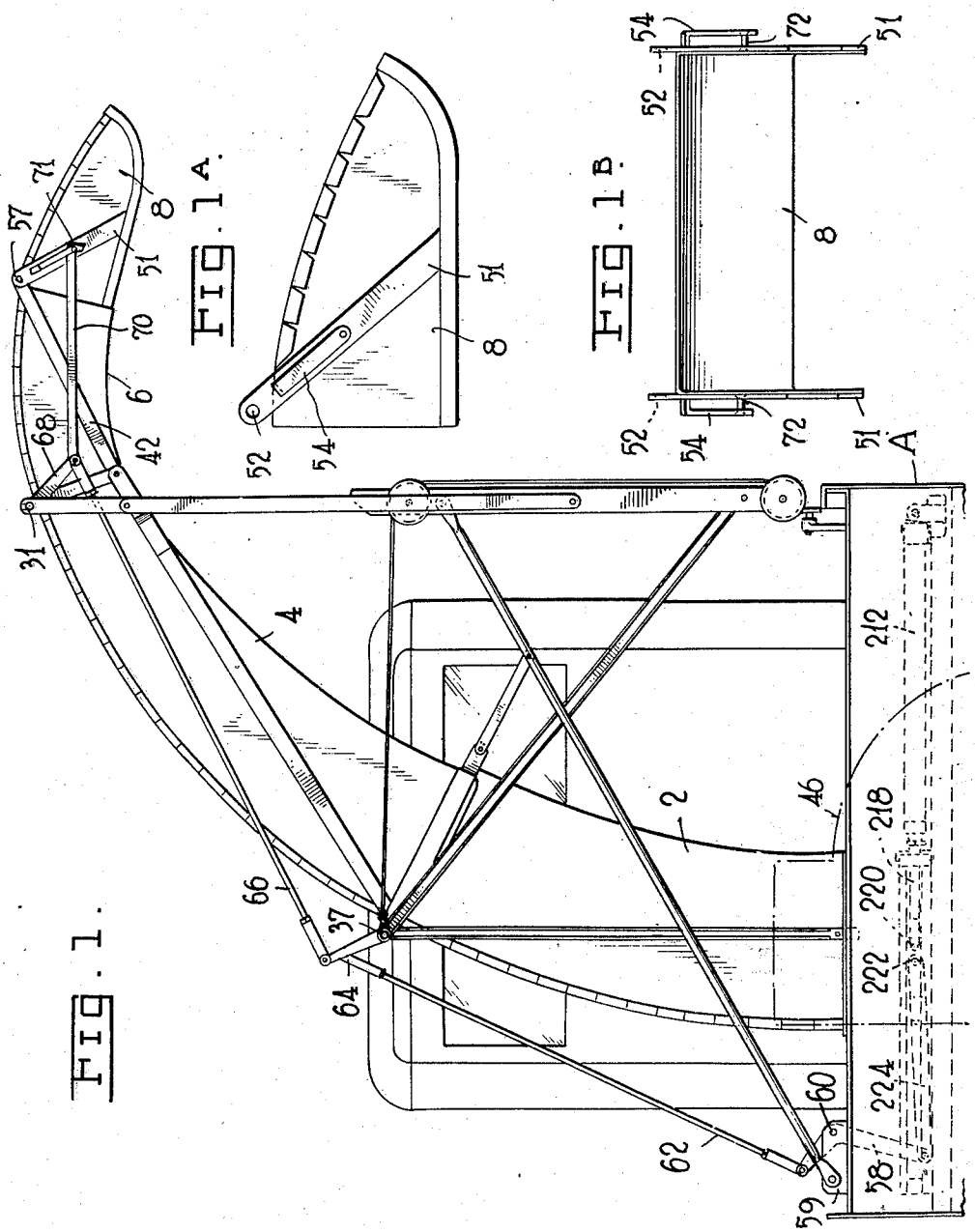


FIG. 1.

FIG. 1A.

FIG. 1B.

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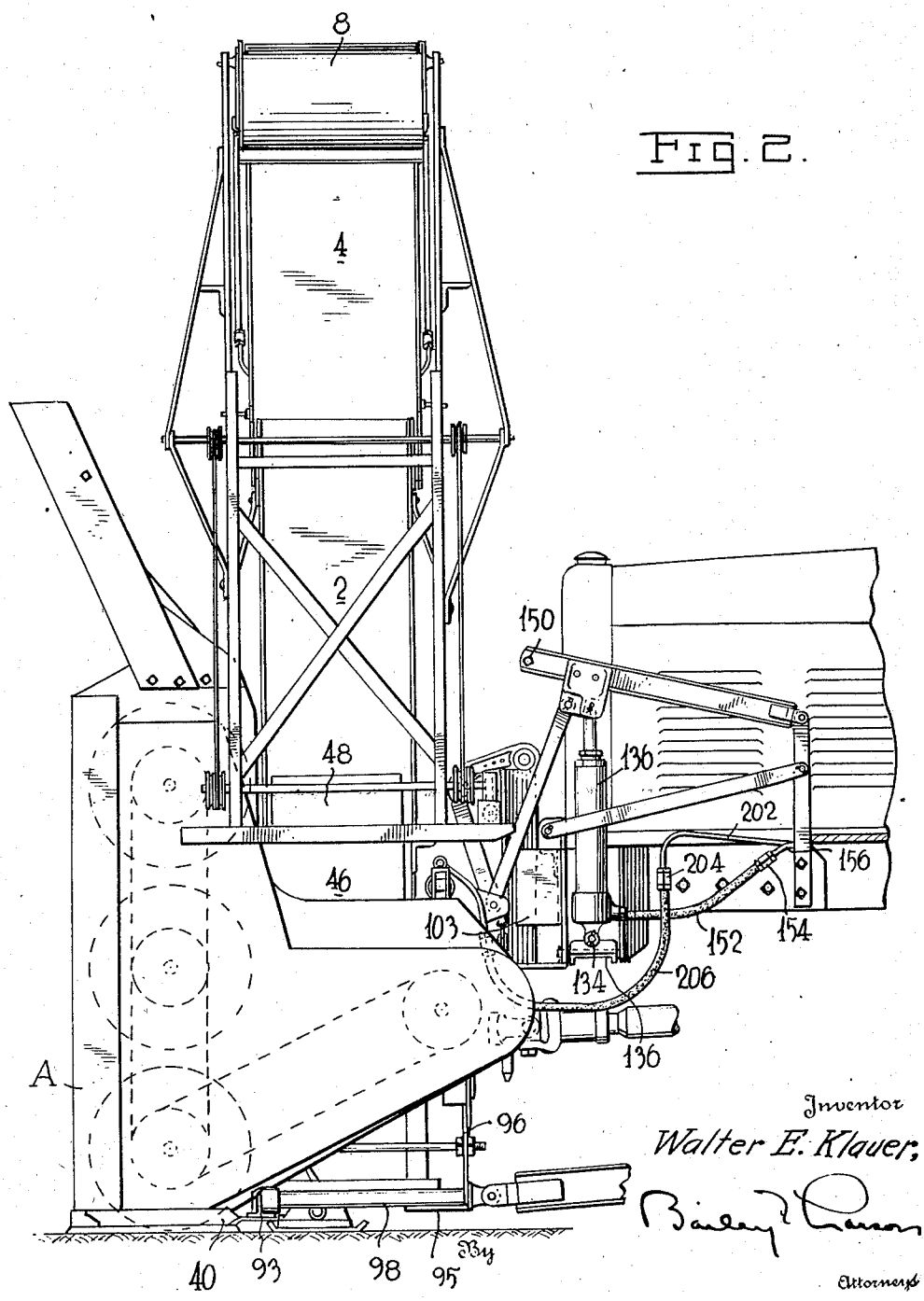


FIG. 2.

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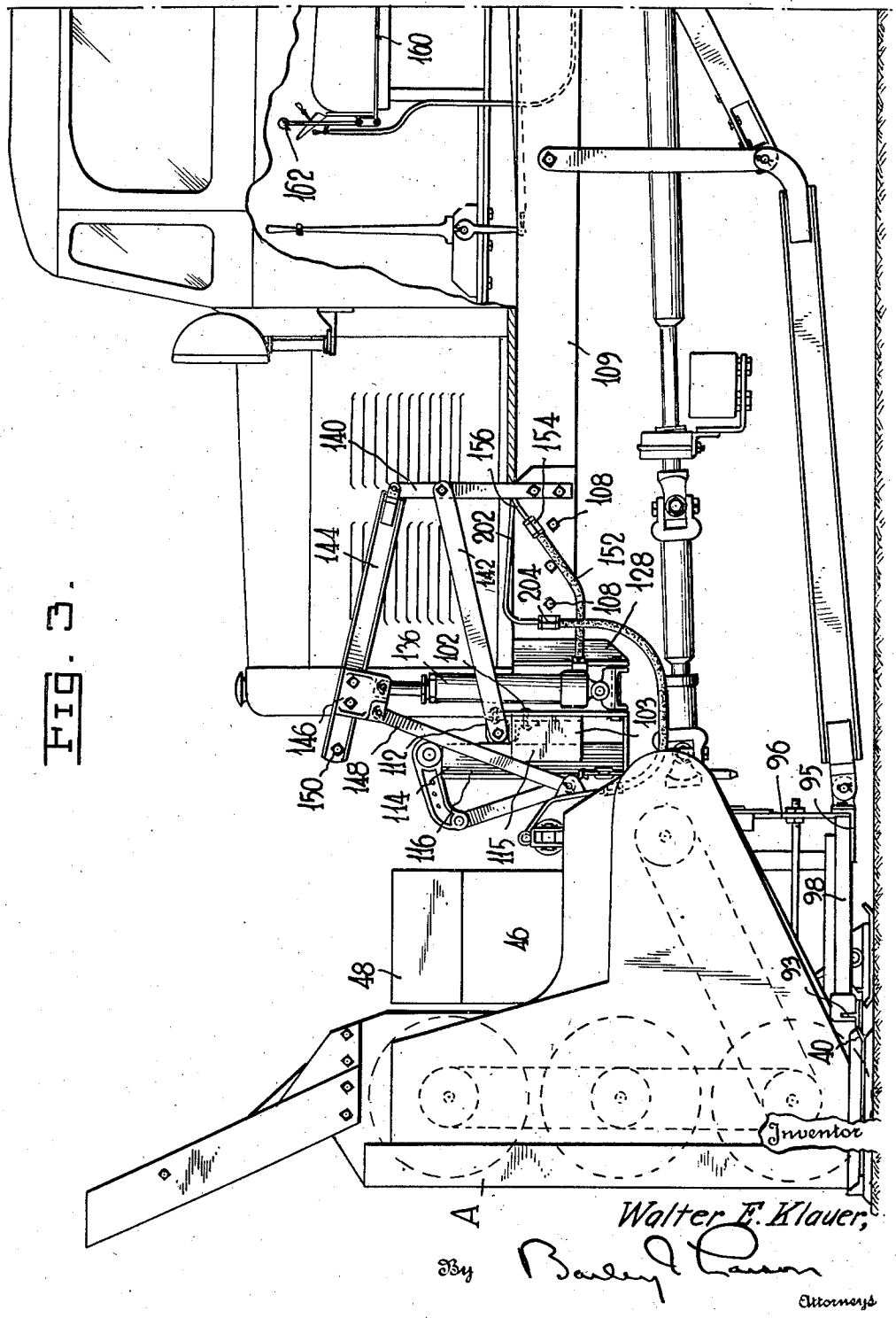


Fig. 3.

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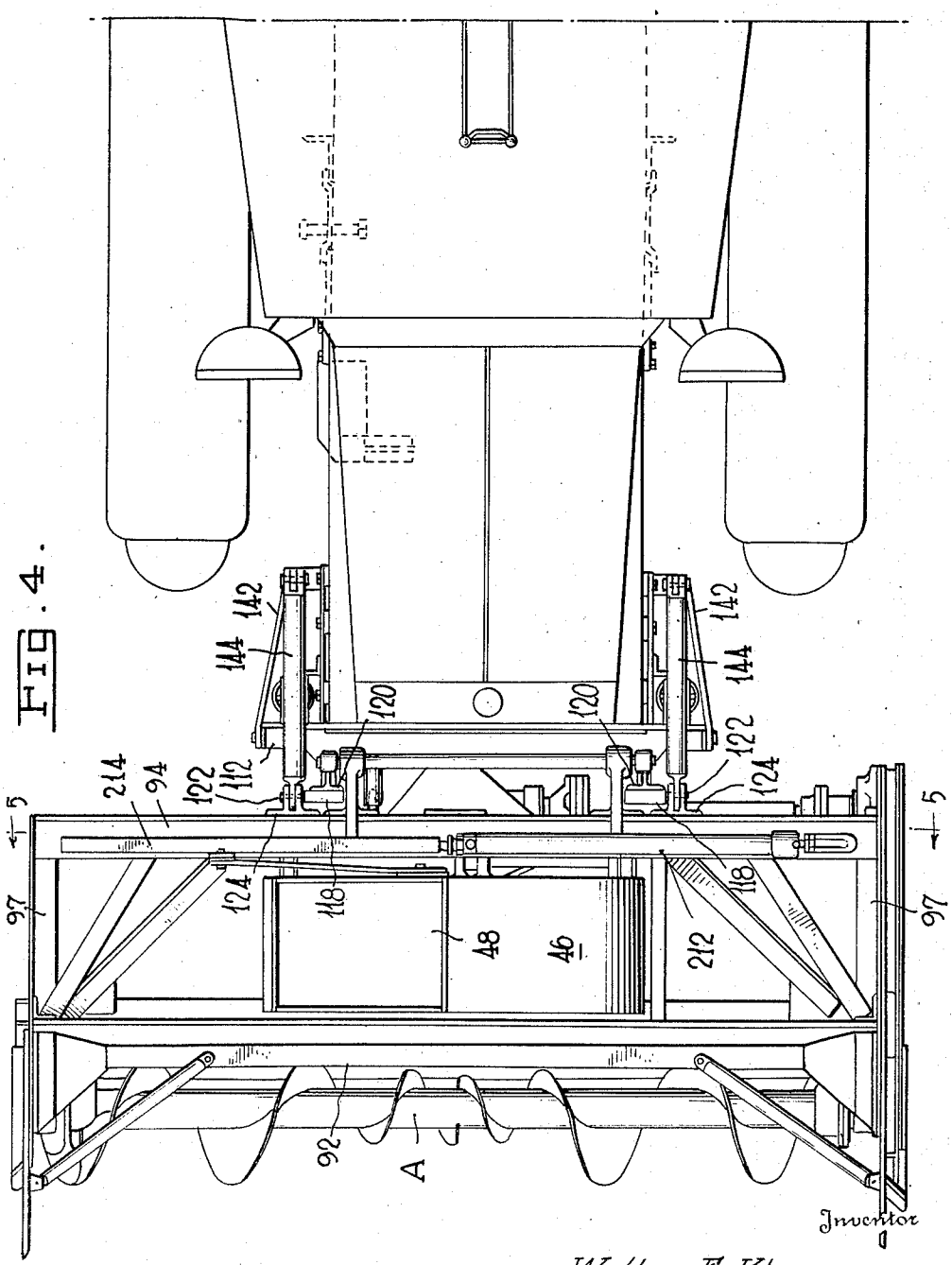


FIG. 4.

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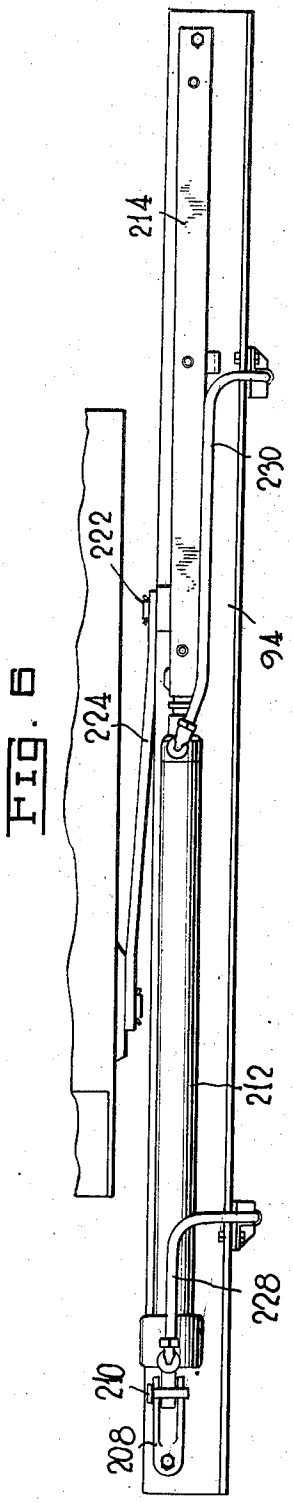


Fig. 6

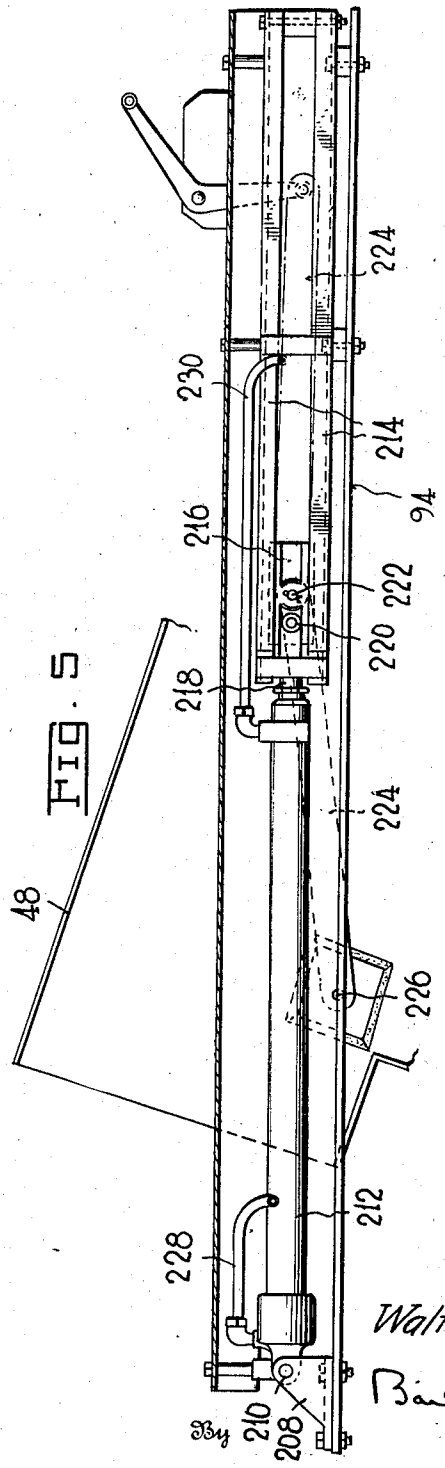


Fig. 5

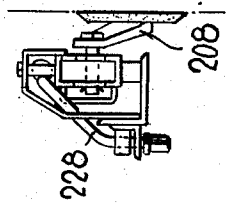


Fig. 7.

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SNOW REMOVING MECHANISM

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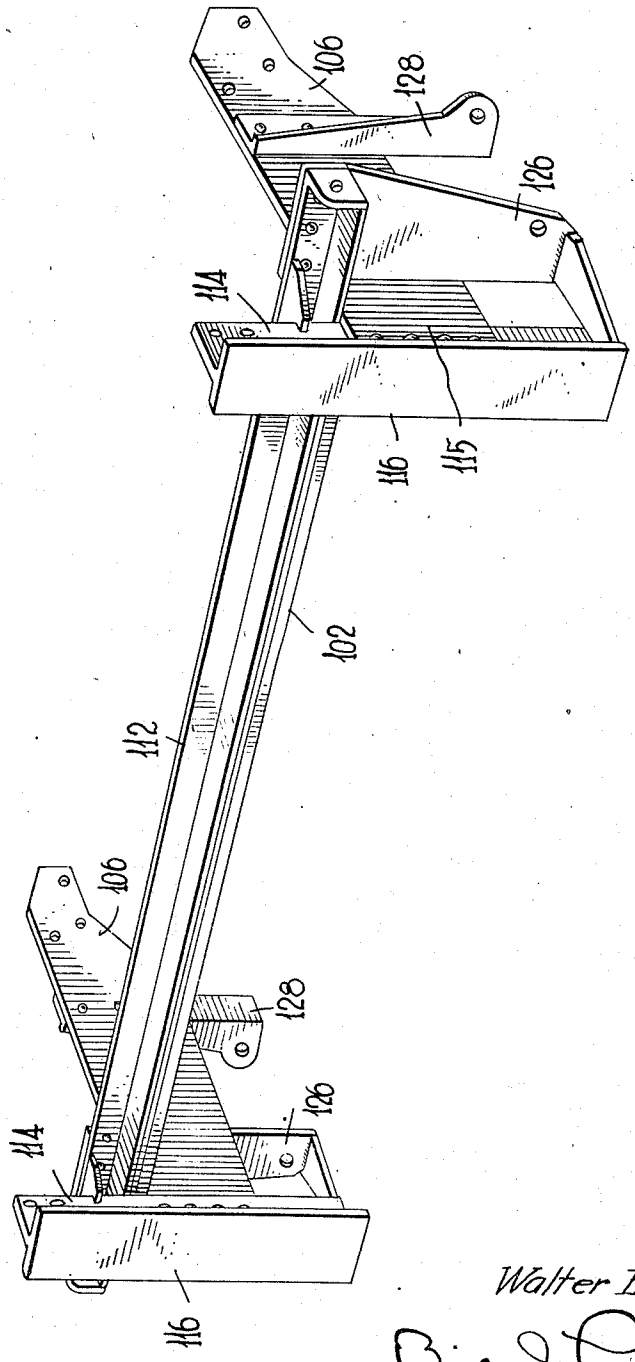


Fig. 8.

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Fig. 9

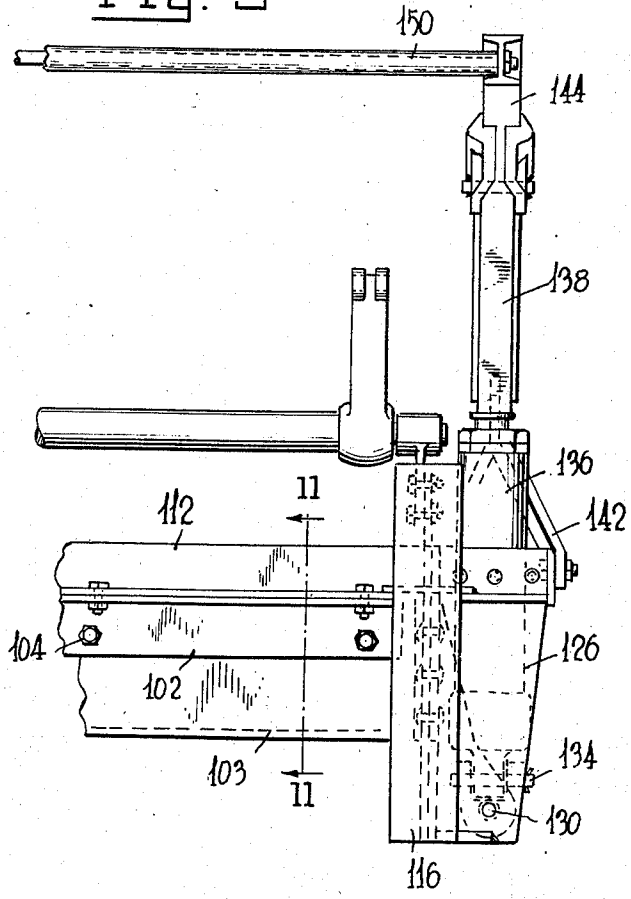


Fig. 11.

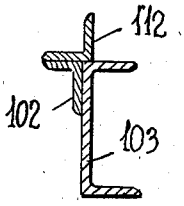
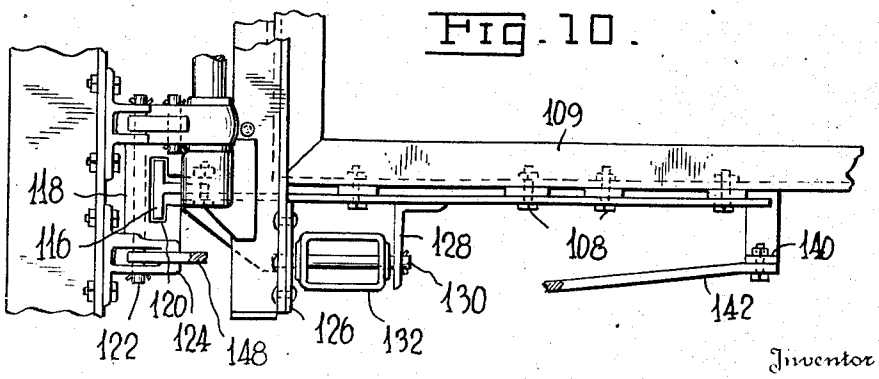


Fig. 10.



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UNITED STATES PATENT OFFICE

2,194,662

SNOW REMOVING MECHANISM

Walter E. Klauer, Dubuque, Iowa

Application May 19, 1937, Serial No. 143,613

4 Claims. (Cl. 37—43)

The present invention relates to snow removing mechanism, and particularly to such mechanism as is adapted for use in removing snow from streets and highways. In particular, it concerns a snow removal chute or hood for a snow plow which chute has for its purpose the directing of the snow removed from the highway to one side thereof or into a truck.

The present invention may, for example, be used in connection with the construction shown and described in my copending application Serial No. 95,688, filed August 12, 1936, now Patent No. 2,144,311. In that application the snow removal mechanism is disposed in front of a motor truck and is provided with a fan casing provided with a blower. The snow as it meets the plow is broken up by an auger and directed to the blower by which it is discharged in an upward direction. The purpose of the snow removal chute of the present invention is to direct the snow as it comes from the blower either into a truck or to one side of the highway. Its use is of particular advantage where it is not permissible to blow the snow to the side of the street or on the sidewalk.

The chute is generally comprised of a curved trough, channel-shaped in cross-section. So that more accurate direction of the removed snow can be effected the chute is provided with a tip member the position of which may be adjusted by the operator of the plow.

The primary object of the present invention is to provide a snow removal chute with such an adjustable tip, the position of which may be controlled by the operator.

Still another object of the invention is to provide a chute with an adjustable tip which may be controlled through fluid pressure means operable from the cab of the motor truck to which the plow is secured.

In my copending application Serial No. 95,688, the snow removal mechanism, as described, is provided with a blower in a fan casing. This fan casing is mounted for movement about an axis and its position may be controlled through fluid pressure means by the operator of the plow from the cab of the motor truck. The present invention has for another object the employment of this fluid pressure means also for the purpose of controlling the tip of the snow removal hood.

Still another object of the invention resides in providing snow removing mechanism at the front of a motor truck in such a manner as to permit vertical up and down movement of the same and to mount a snow chute on this mechanism to move therewith.

A further object of the invention is to provide a vertically movable snow removal apparatus with snow guiding means mounted thereon so as to move therewith and so that it will always be in position to receive the discharged snow.

Other objects of the invention will become more apparent from the following description and appended claims when taken in connection with the accompanying drawings in which:

Fig. 1 is a front elevation view of the invention;

Fig. 1A is an enlarged front elevation of the tip member;

Fig. 1B is a left side elevational view of Fig. 1A;

Fig. 2 is a side elevation of the invention;

Fig. 3 is a side elevation showing the manner which the snow removal mechanism is secured to the front of a truck;

Fig. 4 is a plan view of the arrangement shown in Fig. 3;

Fig. 5 is a cross-section on the line 5—5 of Fig. 4;

Fig. 6 is a top plan view of the fluid pressure control for the spout of the fan casing and for the tip of the chute;

Fig. 7 is an end view of the mechanism of Fig. 6;

Fig. 8 is a perspective view of the unitary frame;

Fig. 9 is a front view of one side of the mechanism for lifting, guiding and equalizing the snow removal mechanism with the snow remover disconnected;

Fig. 10 is a top plan view of one side of the mechanism with parts broken away; and,

Fig. 11 is a cross-section on the line 11—11 of Fig. 9.

Referring now to Fig. 1, the snow removal mechanism proper is generally indicated by the reference character A. The blower which receives the snow from the snow removal mechanism and expels it in an upward direction is indicated by the reference numeral 46 and is shown in dot-dash lines. The snow removal hood or chute is comprised of four sections 2, 4, 6 and 8 which in cross-section are channel-shaped and which form a directing trough for the snow. The section 4 is of slightly larger cross-section than the section 2 so as to telescope thereover when the chute is in folded position as described in my copending application of even date. The

cross-section of the section 6 is larger than that of 4, and that of section 8 larger than that of 6. From Fig. 1 it will be apparent that snow ejected from the blower 46 will be directed in a curved line to the right by the snow removal hood or chute.

For the purposes of the present application, it is not necessary to describe specifically the means used for bracing and supporting the snow removal chute and holding it in upright operative position. This is described in my copending application, filed herewith. Since, however, the present invention is concerned with the adjustability of the tip 8 of the chute it will be necessary to describe briefly the means used for controlling this tip section.

It will be noted that the section 6 is provided with diagonal bracing members on its sides, one of which is shown in Fig. 1 and indicated by the reference numeral 42. The upper ends of these bracing members extend beyond the section and are provided with aligned openings (not shown). The end tip section 8 is also provided with diagonal bracing members 51. These members extend beyond the tip section and their extended portions have aligned apertures 52 as shown in Figs. 1A and 1B. The sections 6 and 8 are joined by a pivotal connection so that the position of the tip section can be adjusted as will be described. The pivotal connection may be effected by passing an axle 57 through the aligned apertures 52 in the tip section and also through the aligned apertures in the extended ends of the diagonal bracing members 42 of the section 6.

The top of the casing of the snow removal mechanism A is provided with a plate 59 which is rigidly secured thereto. Pivoted on this plate as at 60 is a double armed lever 58. The upper arm thereof is connected by means of a rod 62 to an arm 64 which in turn is rigidly mounted on an axle 37 which extends across the back of the chute from one side to the other. There are two arms 64, one on each end of the axle 37 and these arms are connected at their outer ends by means of rods 66 to arms 68 which in turn are pivoted about an axle 31. The reference numeral 70 represents rods or arms, one on each side of the chute, which are connected to the end of the arms 68, and the outer ends of the rods or arms 70 are provided with notches and with pivoted notch members 71 which are adapted to engage pins 72 extending laterally from the sides of the tip 8 of the snow removal chute or hood and connecting the sides with arms 54 (see Fig. 1B). The specific construction of the notches and notch members is shown and described in my copending case of even date. The rods or arms 70 are prevented from lateral displacement on the pins 72 by means of the arms 54. The notches provide means whereby the rods 70 if desired may be disengaged from the pins 72. The tip end 8 of the snow removal chute or hood is pivoted about an axle 57 which passes through the apertures 52.

It should now be apparent that movement of the lower arm of the double armed lever 58 to the left will result in raising the tipped section 8 of the snow removal chute upwardly about its pivot 57 in a counter-clockwise direction. Movement of the lower arm of the double armed lever 58 to the right will result in lowering the tip end section 8 of the snow removal chute in a clockwise direction about its pivot point 57. The exact angle at which snow is shot out from the snow removal hood is thus controlled.

The snow remover as shown in Figs. 2, 3 and 4 is carried at the front of a motor truck or the like by a frame having transverse front, top and bottom members 92 and 93, transverse rear top and bottom members 94 and 95, top side members 97, vertical members 96 and horizontal bottom members 98 which support the end of the scraper 40 forming the bottom portion of the wall of the auger casing.

I provide a unitary frame which may be easily applied to and removed from a truck for carrying the snow remover and the mechanism for manipulating the same (Fig. 8). This supporting and guiding unitary frame for the plow includes a front cross member 102 adapted to be secured by bolts 104 (Fig. 9) to the front cross piece 103 of the chassis and side plates 106 adapted to be secured by bolts 108 (Fig. 10) to the side frame members 109 of the chassis. The cross member 102 has secured thereto and above it another cross member 112 which extends out beyond the sides of the chassis frame. It will be noted that member 112 also extends rearwardly slightly beyond member 102, and that this extension rests on the top of front chassis member 103 (Fig. 11). In this fashion the chassis member supports the weight of the snow remover directly and the whole load thereof is not carried by the bolts.

Both the members 102 and 112 are angle irons. The side members 106 extend forwardly of the chassis frame and of the cross member 102 and at their forward ends support vertically arranged T-shaped rails having web portions 114, bolted to the extensions 115 of the side plates, and cross portions or flanges 116. Plates 126 are secured to and extend downwardly from the ends of the cross member 112, and angle members 128 are secured to the side pieces 106. The parts of this frame are preferably both riveted and welded together, so that the whole frame acts as a unit which may be secured bodily to the truck and will serve as the connection between the snow remover and the vehicle.

Guide blocks or slide members 118 are provided with T-shaped slots 120 (Fig. 10) which fit over the arms of the T rails 114 and thus the blocks 118 are guided thereby for vertical sliding movement. Pins 122 pass through the blocks 18 and through the arms or brackets 124 secured on the cross member 94 of the plow frame, one of these brackets being arranged on each side of each block 118. Thus the plow frame is guided at both sides for straight up and down movement (see Fig. 4).

For raising and lowering the plow a special hydraulic arrangement is provided. Through the pairs of parallel plates 126 and 128 are inserted pins 130 on which are pivotally mounted blocks 132 supporting transverse pins 134. The pins 134 provide pivots for fluid pressure cylinders 136, one on each side of the snow remover, in which are slidably arranged pistons 138.

Secured to the frame side members 106 at points to the rear of the front cross chassis member are uprights 140, which are braced by links 142 connected at one end to the uprights and at the other end to the ends of the transverse member 112. Pivoted to the upper end of the uprights are beams or links 144 (Fig. 3), preferably I beams. These beams carry blocks 146 to which are pivoted the pistons 138 and links 148 which at their outer ends are traversed by the pins 122 in the neighborhood of the outer brackets 124.

Of course one of these lifting devices is provided on each side of the plow, and the outer ends of the beams 144 are connected by a spacer and bracing rod 150. It will be noted that this provides a simple and convenient mechanism for raising and lowering the snow remover without blocking in any manner the front of the radiator of the truck. This is a special advantage since when such trucks are in operation there is danger that the engine will become overheated if the radiator is blocked.

Since the snow chute is mounted on the snow removal apparatus to move vertically therewith, it will always remain in proper position and will not get out of line.

The fluid pressure cylinders 136 are supplied with fluid under pressure through flexible pipes 152 (Figs. 2 and 3), releasable connections 154 and pipes 156. Pipes 156 are connected to a valve chest (not shown) in which is a valve controlled by linkage system 160 through a handle 162 located in the cab of the truck. The details of this valve form no part of the invention and it is sufficient to state that when the valve is moved to one position the piston will be caused to rise, while in the other position it will drop. Fluid under pressure is supplied to the valve chest from a fluid supply tank at any suitable place in the truck.

The fan casing 46 is mounted to rotate, for example, in the manner shown in the Wandscheer Patent No. 1,886,069. It is important to be able to shift the position of the spout 48 from one side to the other of the snow remover so that the direction of the stream of snow may be changed. This is of particular advantage when the snow remover is used in the country. In such a case the snow hood need not be used, the snow being discharged by the blower or fan to the side of the highway. For this purpose, I provide a fluid pressure device for controlling the position of the fan casing. A lever (not shown), in the cab of the truck, through a slidable lever and linkage system (not shown) controls a valve in a valve box supplied with fluid under pressure from a reservoir. Pipes 202 extend from this reservoir to the front of the truck and are connected through couplings 204 to flexible hoses 206.

Mounted on the cross member 94 is a bracket 208 (Fig. 6) which carries a pin 210 supporting one end of a hydraulic cylinder 212. The member 94 also supports a pair of spaced U-shaped rails 214 between which slides a cross head 216. A piston slidable in the cylinder 212 has an extension 218 which is connected by a pin 220 to the cross head 216. A pin 222 carried by the cross head 216 forms a pivot for one end of a link 224 which at its other end engages a pivot pin 226 fixed in the rear wall of the fan casing. Pipes 206 on opposite sides of the plow are connected respectively to pipes 228 and 230 opening into opposite ends of the cylinder 212. It is evident that by admitting fluid under pressure to one side or the other of the piston, the cross head 216 will be caused to move and will shift the spout 48 from one side to the other (see Figs. 5, 6 and 7).

According to the present invention this fluid pressure system for shifting the spout of the fan casing may also be used for the purpose of controlling the position of the tip end section 8 of the snow removal chute. This is easily accomplished by disengaging the link 224 from the rear wall of the fan casing and by connecting it to the lower arm of the double-armed lever 58 (see Fig. 1).

It will be manifest with such an arrangement that by admitting fluid under pressure to one side or the other of the piston cylinder 212, the cross head 216 will be caused to move and through the link 224 will swing the double-armed lever 58 one way or the other about its pivot 60. This in turn, through the linkage system 62, 64, 66 and 70, will result in tilting the end tip section 8 of the chute about its pivot 57. The position of the tip section is thus controlled by fluid pressure by the operator of the plow from the cab of the motor truck and a more accurate control of the direction of the discharged snow is effected.

Obviously changes may be made in the structure without departing from the inventive concept. For example, it is within the scope of this invention to employ mechanical or electrical means for controlling the chute tip, and I do not intend to be limited to the exact constructions illustrated and described except as by the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A snow removing apparatus, comprising, snow discharge means the position of which is capable of adjustment, means for directing the snow to said discharge means, snow guiding means disposed to receive snow from said discharge means, said snow guiding means having a tip section the position of which is capable of adjustment, and fluid pressure means for selectively controlling the position of said snow discharge means and the tip section of said snow guiding means.

2. A snow removing apparatus mounted on a vehicle, comprising, a snow discharge spout the position of which is capable of adjustment, means for removing snow in the vicinity of the vehicle and for ejecting said snow through said spout, snow guiding means disposed above said spout to receive snow from the same, said guiding means having a tip portion the position of which is capable of adjustment, fluid pressure operating mechanism, and means to connect said mechanism selectively to said spout and to said guiding means.

3. A snow removing apparatus mounted on a vehicle, comprising, a snow discharge spout the position of which is capable of adjustment, means for removing snow from the path of the vehicle and for ejecting the same through said spout, a trough-shaped snow guiding chute disposed above said spout to receive the snow ejected therefrom, said chute being comprised of a plurality of sections, the tip section being mounted for adjustability of position, a linkage system for controlling the position of said tip section, fluid pressure mechanism, and means to connect said mechanism selectively to said spout and to said linkage system.

4. A snow removing apparatus, comprising, snow discharge means the position of which is capable of adjustment, means for directing the snow to said discharge means, snow guiding means disposed to receive snow from said discharge means, said snow guiding means having a portion the position of which is capable of adjustment, a fluid pressure means for selectively controlling the position of said snow discharge means and the adjustable portion of said snow guiding means.

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