

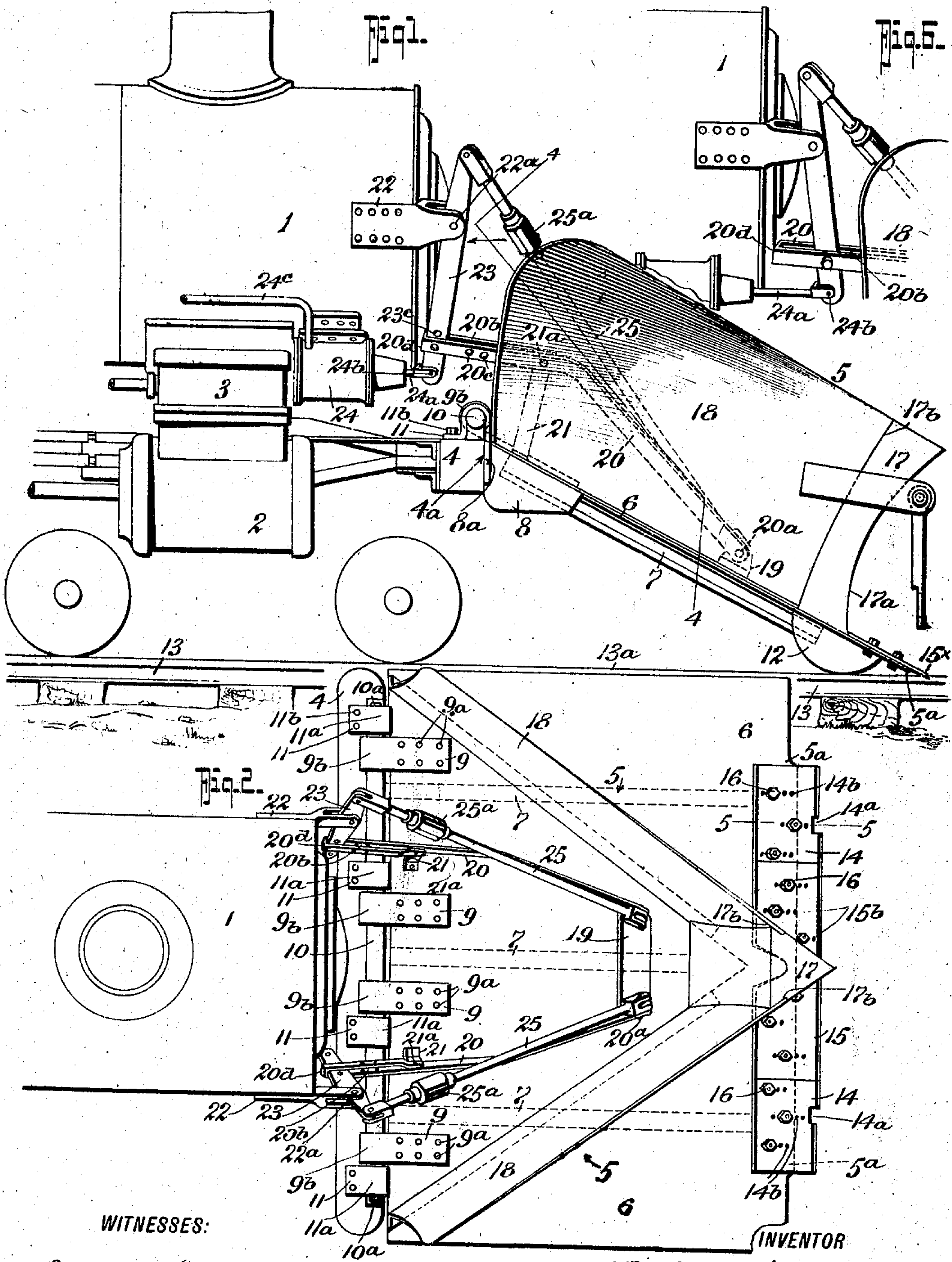
No. 866,919.

PATENTED SEPT. 24, 1907.

W. CROSS.  
SNOW PLOW.

APPLICATION FILED JUNE 15, 1907.

2 SHEETS—SHEET 1.



WITNESSES:

John T. Schrott.  
H. Woodard

William Cross

BY

Fred G. Dietrich  
ATTORNEYS.

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2 SHEETS—SHEET 2.

Fig 3.

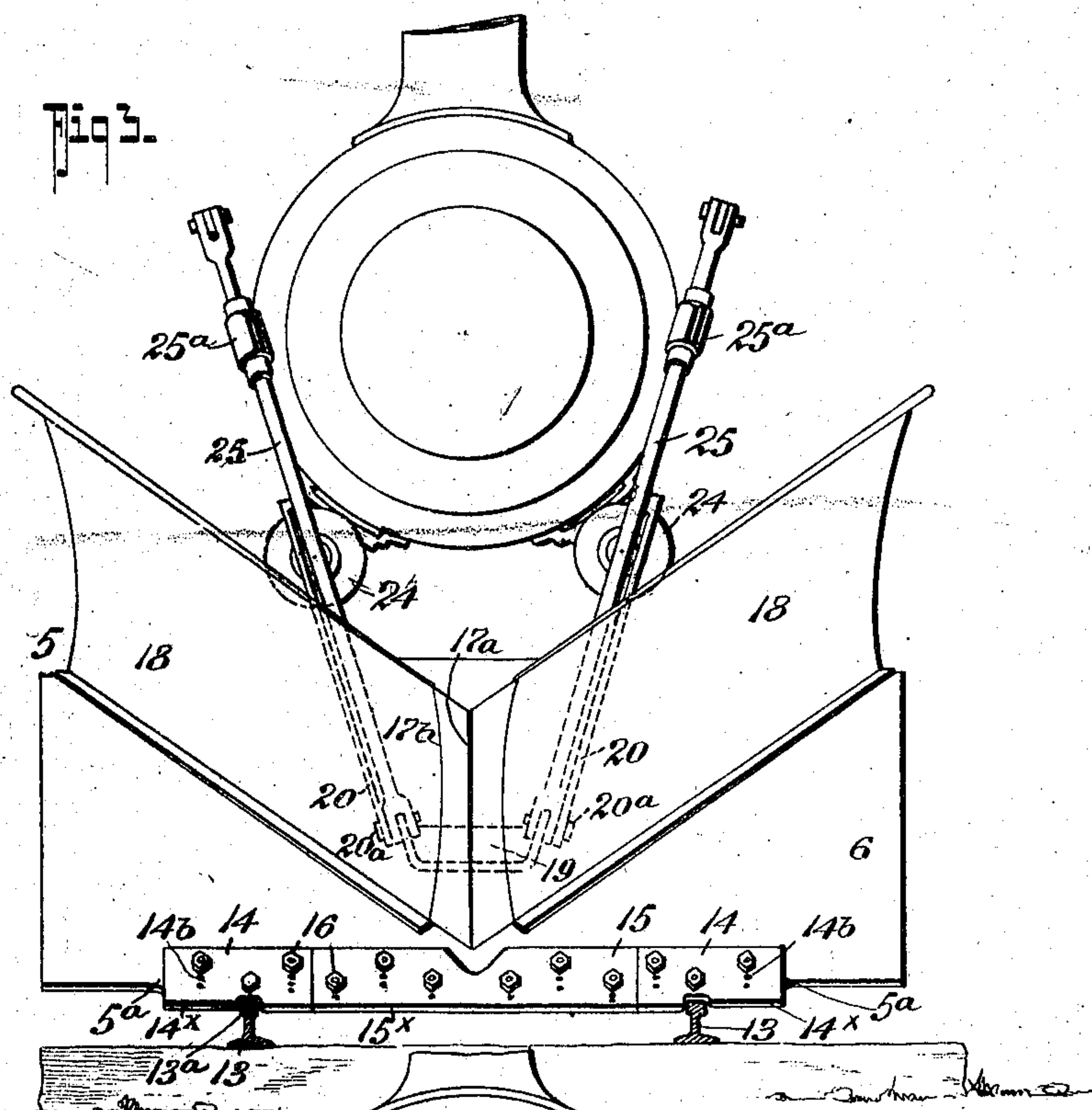
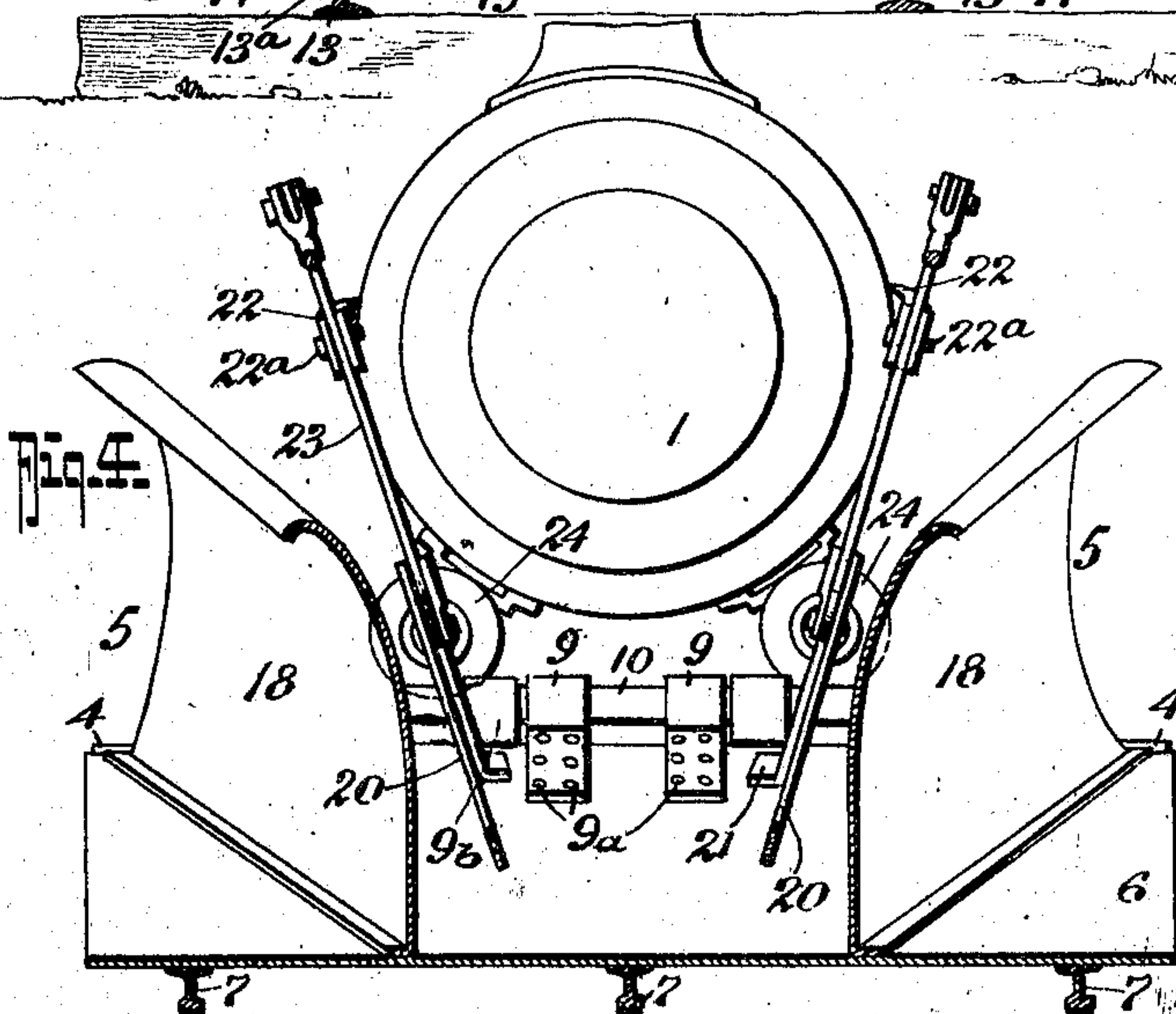


Fig 4.



WITNESSES:

John I. Schrott  
H. Woodard

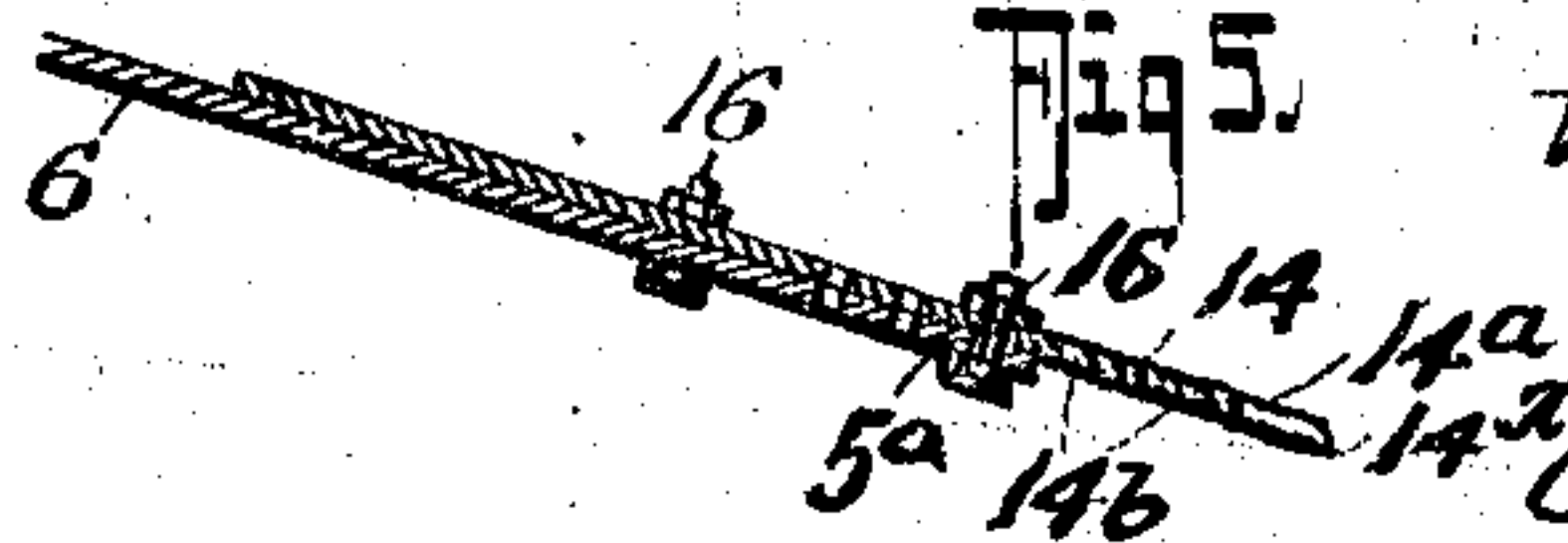
INVENTOR

William Cross

BY

Fred G. Dietrich  
ATTORNEYS.

Fig 5.





# UNITED STATES PATENT OFFICE.

WILLIAM CROSS, OF WINNIPEG, MANITOBA, CANADA.

## SNOW-PLOW.

No. 866,919.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed June 15, 1907. Serial No. 379,238.

*To all whom it may concern:*

Be it known that I, WILLIAM CROSS, residing at Winnipeg, Canada, have invented certain new and useful Improvements in Snow-Plows, of which the following is a specification.

My invention relates to certain new and useful improvements in snow plows for use in connection with locomotive engines for opening the "right of way" after snow storms.

In its generic nature the invention embodies a plowing mechanism comprising a hinged platform carrying a detachable and removable blade or nose-plate, a dividing peak, and laterally deflecting members cooperating therewith to throw the snow and ice to one side of the track. The invention also embodies means for supporting the nose end of the plow over the rails and an automatic means for raising or lowering the plow out of the way when passing over switches or when it is desired to render the plow inoperative.

Primarily, my invention has for its object to provide an apparatus of this character of a very simple and effective construction, which can be easily and cheaply manufactured and which will readily serve its intended purposes.

Furthermore, my invention has for its object to provide a device of the foregoing character which can be attached to the ordinary type of locomotive engine and may be allowed to remain thereon for any desired length of time, and which can be easily and quickly raised up out of the way to clear frogs or switches by means of air or steam power, under full control of the engineer.

With other objects in view, than have been heretofore specified, the invention also comprises certain novel details of construction, combination and arrangement of parts, all of which will be first described in detail, and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which,—

Figure 1, is a side elevation of the forward or pilot end of a locomotive with my invention applied. Fig. 2, is a plan view thereof. Fig. 3, is a front elevation thereof. Fig. 4, is a cross section on the line 4—4 of Fig. 1. Fig. 5, is a detail longitudinal section on the line 5—5 of Fig. 2. Fig. 6, is a detail view of one of the piston controlled operating levers and its cooperative parts, showing how the same may be secured to hold the plow elevated.

Referring now to the accompanying drawings in which like numerals and letters of reference indicate like parts in all of the figures 1 designates the locomotive having the operating piston chest 2 and valve steam box 3 that cooperates therewith, all of which may be of the usual type, as may also be the front buffer sill 4.

5 designates my improved snow plow which it will be seen consists of a rectangular bed plate 6 secured to a plurality of rails 7, which are securely bolted or other-

wise fastened beneath the bed plate 6, and which have their upper ends cooperatively engaged by the transverse support 8, which extends beneath the upper end of the bed plate 6.

9 designates a series of hinges secured to the bed plate and bolted to the transverse support 8 by suitable bolts 9<sup>a</sup>, as shown, and the hinge members 9 have bearings 9<sup>b</sup> to be received on the fulcrum shaft or rod 10 that also passes through bearing portions 11<sup>a</sup> of bracket members 11 which are secured as at 11<sup>b</sup> by bolts or otherwise to the sill 4, as indicated.

The support 8 has a surface 8<sup>a</sup> to engage with the front surface 4<sup>a</sup> of the sill 4, when the plow is in its operative position, as shown in Fig. 1, and thus limit the downward drop or movement of the plow on its fulcrum shaft 10, the shaft 10 being held from longitudinal deflection by keys 10<sup>a</sup> or in any other suitable manner.

The platform carries at its front portion, beneath the platform, a pair of knees, 12, which ride on the rails 13, as clearly shown in Fig. 1 of the drawings, and these knees 12 are removably bolted, or otherwise secured to the platform 6 so that as they become worn new ones may be substituted therefor.

The platform 5 has its front portion terminating in a nose plate receiving portion 5<sup>a</sup> upon which is adjustably secured the nose plates 14 and 15, the plate 15 being the central one and of elongated shape to fit between the rails 13, the plates 14 being of shorter length than the plate 15 and provided with notches or cutaway portions 14<sup>a</sup> to fit over the heads 13<sup>a</sup> of the rails 13. The plates 14 and 15 are adjustably secured to the bed plate 6 by bolts 16 which pass through apertures 14<sup>b</sup> and 15<sup>b</sup> in the nose plates 14 and 15 respectively, the apertures 14<sup>b</sup> and 15<sup>b</sup> being arranged in staggered series from one side of the plow 5 to the other, as clearly shown in Figs. 2 and 3 of the drawings.

Mounted centrally and forward of the platform 6 is a peak 17 which has its front face of wedge shape and provided with an inwardly curved edge 17<sup>a</sup> to form a peak, as it were, for dividing the snow and ice longitudinally and cooperating with the curved baffle members 18 which are secured to the bed plate 5 in any approved manner, and which are also secured to the nose 17 by being bolted or otherwise secured in the countersunk portion 17<sup>b</sup>, thereof it being understood that the baffles 18 diverge from the front portion of the bed plate 6 toward the rear thereof so as to deflect the materials parted by the peak 17 and scooped up by the nose plates 14 and 15 into two portions which are laterally fed by the baffles 18 and deposited at the sides of the track.

19 designates a bracket secured to the bed plate 6 slightly in the rear of the nose 17 and between the baffles 18.

20 designates a pair of supporting straps or bars fulcrumed at 20<sup>a</sup> to the bracket 19 and diverging upwardly and rearwardly of the bed plate 6 where they



are secured to brackets 21 that project upwardly from the bed plate 6, by bolts or rivets 21<sup>a</sup>, as shown, the bars 20 passing on to the rear of the brackets 21 and being bent back upon themselves as at 20<sup>a</sup> to form a slot-way 20<sup>b</sup> to receive the lower ends of the levers 23, which will be hereinafter referred to. The arms or bars 20 at their bent back portion have the ends thereof secured by the bolts 21<sup>a</sup> to the brackets 21, as shown, and the bent back portions 20<sup>a</sup> of the bars 20 have a series of apertures 20<sup>c</sup> to cooperate with the apertures 23<sup>c</sup> in the levers 23 so that the levers 23 can be locked to the bars 20 by passing pins through the apertures 20<sup>c</sup> and 23<sup>c</sup> at times as will be more fully explained later.

The levers 23 are mounted in brackets 22 at each side of the locomotive head, the brackets 22 being secured to the locomotive side, as shown in Fig. 1. The levers 23 are fulcrumed at 22<sup>a</sup> in the brackets 22 and at their lower ends are connected with the operating piston rod 24<sup>a</sup> by a pivot bolt 24<sup>b</sup> or in any other suitable manner.

25 designates connecting rods which are pivoted at their lower ends to the brackets 19 and at their upper ends they are pivoted to the levers 23, the rods 25 being made in sections and provided with turn-buckles 25<sup>a</sup> whereby they may be lengthened or shortened, as conditions may require.

The piston rod 24<sup>a</sup> projects into the piston cylinder 24 and carries the piston 24<sup>a</sup>, as shown, working agent being admitted to the cylinder 24 in any approved manner, such for instance, as through the medium of a steam or air supply pipe 24<sup>c</sup>, as indicated in Fig. 1 of the drawings.

So far as described, the manner in which my invention operates will be best explained as follows: When it is desired to clear snow and ice from the tracks, the parts are in the position shown in Fig. 1, with the nose plates 14 and 15 in close proximity to the rails 13 and with the sharpened and cutting edges 14<sup>x</sup> and 15<sup>x</sup> of the nose plates 14 and 15 projecting in a plane below the tread surface of the rails, as shown in Fig. 3 of the drawings. When the parts are in this position the knees 12 will rest upon the rails, as will be readily apparent by reference to Fig. 1 of the drawings. As the locomotive travels forward the plow being of great width acts as a shovel, scooping up the snow and ice which is divided by the peak 17 and deflected toward the sides of the track by the deflectors or baffles 18, hereinbefore referred to, they being of curved cross sectional form to aid in throwing off the materials to one side. In passing over switches or other obstructions, the engineer turns on the working agent to the piston casing 24 which causes the piston rod 24<sup>a</sup> to be forced upwardly and rock the lever 23, thus causing the plow to be raised to the position shown in dotted line in Fig. 1. When it is desired to maintain the plow elevated without using the steam or other working agent pressure, the lever 23 may be locked to the bars 20 by pins, as indicated in Fig. 6.

From the foregoing description it will be seen that I have provided a very simple and effective construction of snow plow which can be readily attached to the buffer beam of an engine in such a manner as to enable it to be raised or lowered as conditions may require, and by the provision of a steam or other operated mechanism for elevating the plow, it will be seen that the

same can be under the control of the engineer at all times.

By making the knees of the plow perfectly square, it will be seen that in operating in snow it has the effect of a great shovel, first loading itself and then pitching the materials away on both sides of the track by means of the curved conical shape of the baffle members 18 and by providing the nose plates of the plow with their cutting edges projected below the rails (at about one and a half inches, in practice) all the impediments to the flanges of the engine and car wheels will be removed. It should be understood, that in practice, the nose plates 14 and 15 are not of such strength that they will affect the safety of the engine in case the engineer fails to raise the plow in ample time to cross over safely, although they are of ample strength to cut snow and ice that may accumulate on the track in the way of the flanges.

It will be also noticed that my invention is such as to be readily attached to the locomotive front end and may be left permanently thereon for winter service and yet will not interfere with the engine.

From the foregoing description taken in connection with the accompanying drawings it is thought the complete construction, operation and many advantages of my invention will be readily understood by those skilled in the art to which the invention appertains.

What I claim is:

1. An apparatus of the class described, comprising a bed plate pivotally secured to the buffer beam of a locomotive, a removable nose plate carried by said bed plate, lateral deflectors and a peak carried by said bed plate, and fluid pressure operated means for raising or lowering the bed plate on its pivot, substantially as shown and described. 95
2. An apparatus of the class described, a bed plate pivotally secured to the buffer beam of a locomotive, a removable nose plate carried by said bed plate, lateral deflectors and a peak carried by the bed plate, fluid pressure operated means for raising or lowering the bed plate on its pivot, and knees secured beneath the bed plate to cooperate with the track rails, substantially as shown and described. 100
3. An apparatus of the class described, a bed plate, means for pivotally mounting said bed plate on the buffer beam of a locomotive, track rails secured beneath said bed plate, a peak carried by said bed plate, and curved deflectors diverging from the front of the bed plate toward the rear and cooperatively engaging said peak, substantially as shown and described. 105
4. An apparatus of the class described, a bed plate, means for pivotally mounting said bed plate on the buffer beam of a locomotive, track rails secured beneath said bed plate, a peak carried by said bed plate, and curved deflectors diverging from the front of the bed plate toward the rear and cooperatively engaging said peak, and fluid pressure controlled means for swinging said bed plate and its carried parts on its pivot, substantially as shown and described. 110
5. An apparatus of the class described, a bed plate, means for pivotally mounting said bed plate on the buffer beam of a locomotive, track rails secured beneath said bed plate, a peak carried by said bed plate, curved deflectors diverging from the front of the bed plate toward the rear and cooperating with said peak, fluid pressure controlled means for swinging said bed plate and its carried parts on its pivot, a transverse support secured beneath said bed plate and having a portion for engaging the buffer beam, of the locomotive, substantially as shown and described. 115
6. An apparatus of the class described, a bed plate, means for pivotally mounting said bed plate on the buffer beam of a locomotive, track rails secured beneath said bed plate, a peak carried by said bed plate, curved deflectors diverging from the front of the bed plate toward the rear and cooperating with said peak, fluid pressure controlled 120



- means for swinging said bed plate and its carried parts on its pivot, a transverse support secured beneath said bed plate and having a portion for engaging the buffer beam of the locomotive, and knees secured beneath said bed plate for resting on the track rails, substantially as shown and described.
7. An apparatus of the class described, a bed plate, means for pivotally mounting said bed plate on the buffer beam of a locomotive, track rails secured beneath said bed plate, a peak carried by said bed plate, curved deflectors diverging from the front of the bed plate toward the rear and cooperating with said peak, fluid pressure controlled means for swinging said bed plate and its carried parts on its pivot, a transverse support secured beneath said bed plate and having a portion for engaging the buffer beam of the locomotive, knees secured beneath said bed plate for resting on the track rails, and a nose plate secured to the front edge of said bed plate to cooperate with said peak, substantially as shown and described.
8. An apparatus of the class described comprising a bed plate, means for pivotally supporting said bed plate from the buffer beam of a locomotive, means carried by the bed plate and resting on the track rails for supporting the front end thereof, a nose plate carried by the bed plate at the front end thereof, and means for deflecting the material from the bed plate toward the sides thereof, substantially as shown and described.
9. An apparatus of the class described comprising a bed plate, means for pivotally supporting said bed plate from the buffer beam of a locomotive, means carried by the bed plate and resting on the track rails for supporting the front end thereof, a nose plate carried by the bed plate at the front end thereof, means for deflecting the material from the bed plate toward the sides thereof, and fluid pressure controlled means for swinging said bed plate on its pivot, substantially as shown and described.
10. An apparatus of the class described comprising a bed plate, means for pivotally supporting said bed plate from the buffer beam of a locomotive, means carried by the bed plate and resting on the track rails for supporting the front end thereof, a nose plate carried by the bed plate at the front end thereof, means for deflecting the material from the bed plate toward the sides thereof, fluid pressure controlled means for swinging said bed plate on its pivot, said fluid pressure controlled means comprising a relatively fixed piston cylinder therefor, a pivotally mounted lever cooperatively connected with said piston and with said bed plate, substantially as shown and described.
11. An apparatus of the class described, comprising a bed plate, means for pivotally supporting said bed plate from the buffer beam of a locomotive, means carried by the bed plate and resting on the track rails for supporting the front end thereof, a nose plate carried by the bed plate at the front thereof, means for deflecting the material from the bed plate toward the sides thereof, fluid pressure controlled means for swinging said bed plate on its pivot, said fluid pressure controlled means comprising a relatively fixed piston cylinder therefor, a pivotally mounted lever cooperatively connected with said piston and with said bed plate, and a brace bar secured to said bed plate and having a portion for embracing said lever, substantially as shown and described.
12. An apparatus of the class described comprising a bed plate, means for pivotally supporting said bed plate from the buffer beam of a locomotive, means carried by the bed plate and resting on the track rails for supporting the front end thereof, a nose plate carried by the bed plate at the front end thereof, means for deflecting the material from the bed plate toward the sides thereof, fluid pressure controlled means for swinging said bed plate on its pivot, said fluid pressure controlled means comprising a relatively fixed piston cylinder therefor, a pivotally mounted lever cooperatively connected with said piston and with said bed plate, a brace bar secured to said plate and having a portion for embracing said lever, and means for cooperatively locking said brace bar and lever together at times to hold the bed plate in its elevated position substantially as shown and described.
13. An apparatus of the class described comprising in combination with a bed plate, securable to the buffer beam of a locomotive, rails secured beneath said bed plate to brace the same longitudinally, a transverse support secured beneath said bed plate at its rear end, a nose plate secured to the bed plate at its front end, knees secured beneath said bed plate for resting on the track rails, a peak secured to the bed plate at its front end, a pair of diverging deflector members secured to the bed plate to cooperate with said knees and deflect the material toward the side of the bed plate, a pair of pivotally mounted levers carried by the locomotive, a pair of pistons and piston casings also carried by the locomotive, means for admitting working agent into said piston casings, said pistons being cooperatively connected with said levers, rods cooperatively connecting said levers with said bed plate, substantially as shown and described.
14. An apparatus of the class described comprising in combination with a bed plate securable to the buffer beam of a locomotive, rails secured beneath said bed plate to brace the same longitudinally, a transverse support secured beneath said bed plate at its rear end, a nose plate secured to the bed plate at its front end, knees secured beneath said bed plate for resting on the track rails, a peak secured to the bed plate at its front end, a pair of diverging deflector members secured to the bed plate to cooperate with said knees and deflect the materials toward the side of the bed plate, a pair of pivotally mounted levers carried by the locomotive, a pair of pistons and piston casings also carried by the locomotive, means for admitting working agent into said piston casings, said pistons being cooperatively connected with said levers, rods cooperatively connecting said levers with said bed plate, said rods having tension devices or take-ups, substantially as shown and described.
15. An apparatus of the class described, comprising in combination with a bed plate, securable to the buffer beam of a locomotive, rails secured beneath said bed plate to brace the same longitudinally, a transverse support secured beneath said bed plate at its rear end, a nose plate secured to the bed plate at its front end, knees secured beneath said bed plate for resting on the track rails, a peak secured to the bed plate at its front end, a pair of diverging deflector members secured to the bed plate to cooperate with said knees and deflect the material toward the side of the bed plate, a pair of pivotally mounted levers carried by the locomotive, a pair of pistons and piston casings carried also by the locomotive, means for admitting working agent into said piston casings, said pistons being cooperatively connected with said levers, rods cooperatively connecting said levers with said bed plate, and brace bars carried by said bed plate and provided with loop portions for embracing said pivotally mounted levers, substantially as shown and described.
16. An apparatus of the class described comprising in combination with a bed plate securable to the buffer beam of a locomotive, rails secured beneath said bed plate to brace the same longitudinally, a transverse support secured beneath said bed plate at its rear end, a nose plate secured to the bed plate at its front end, knees secured beneath said bed plate for resting on the tracks, a peak secured to the bed plate at its front end, a pair of diverging deflector members secured to the bed plate to cooperate with said knees and deflect the material toward the side of the bed plate, a pair of pivotally mounted levers carried by the locomotive, a pair of pistons and piston casings also carried by the locomotive, means for admitting working agent into said piston casings, said pistons being cooperatively connected with said levers, rods cooperatively connecting said levers with said bed plate, said rods having tension devices or take-ups, and brace bars carried by said bed plate and provided with loop portions for embracing said pivotally mounted levers, substantially as shown and described.
17. An apparatus of the class described comprising in combination with a bed plate securable to the buffer beam of a locomotive, rails secured beneath said bed plate to brace the same longitudinally, a transverse support secured beneath said bed plate at its rear end, a nose plate secured to the bed plate at its front end, knees secured beneath said bed plate for resting on the tracks, a peak secured to the bed plate at its front end, a pair of diverg-



ing deflector members secured to the bed plate to cooperate with said knees and deflect the material toward the side of the bed plate; a pair of pivotally mounted levers carried by the locomotive, a pair of pistons and piston casings carried also by the locomotive, means for admitting working agent into said piston casings, said pistons being cooperatively connected with said levers, rods cooperatively connecting said levers with said bed plate, said rods having tension devices or take-ups brace bars carried

by said bed plate and provided with loop portions for embracing said pivotally mounted levers, and means for locking said brace bars and levers together to hold the bed plate elevated at times, substantially as shown and described.

WILLIAM CROSS.

Witnesses:

GEO. PATTERSON.

J. MATHESON.