(No Model.) 4 Sheets—Sheet 1.

W. H. BOHNENKAMP & W. J. LINDSEY.

FLANGER.

No. 590,677. Patented Sept. 28, 1897.

FIG. 2.

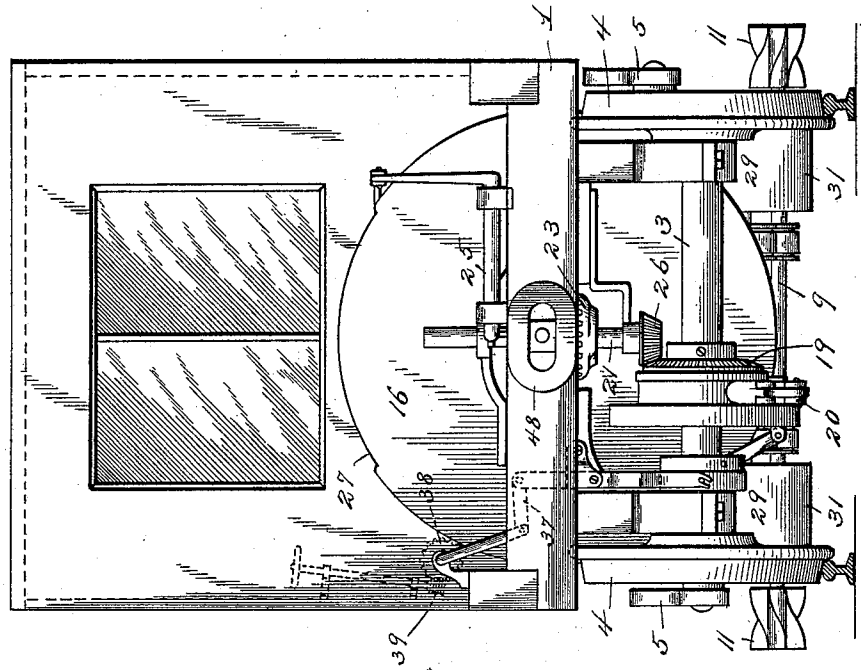
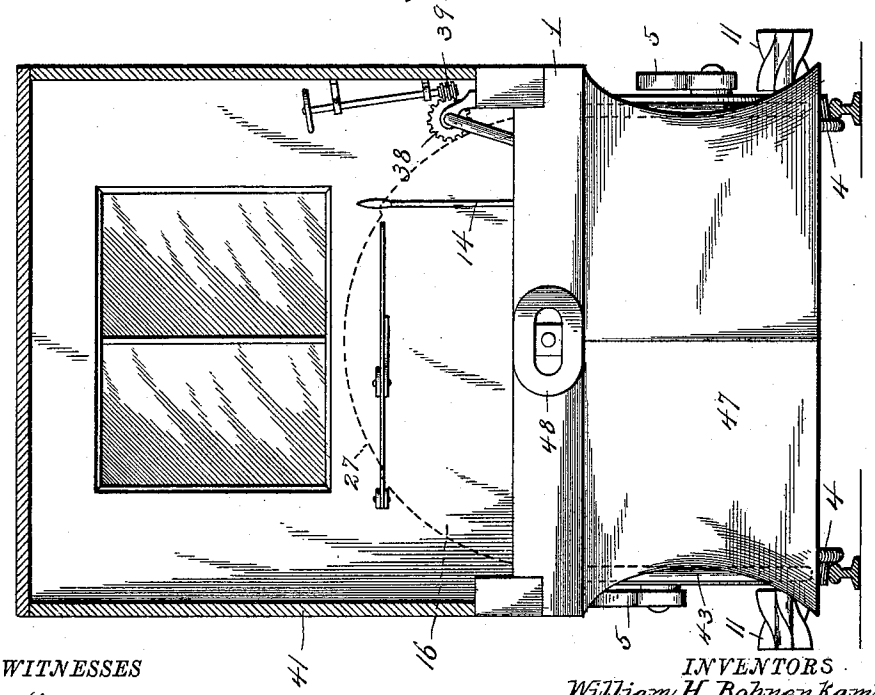


FIG. 1.



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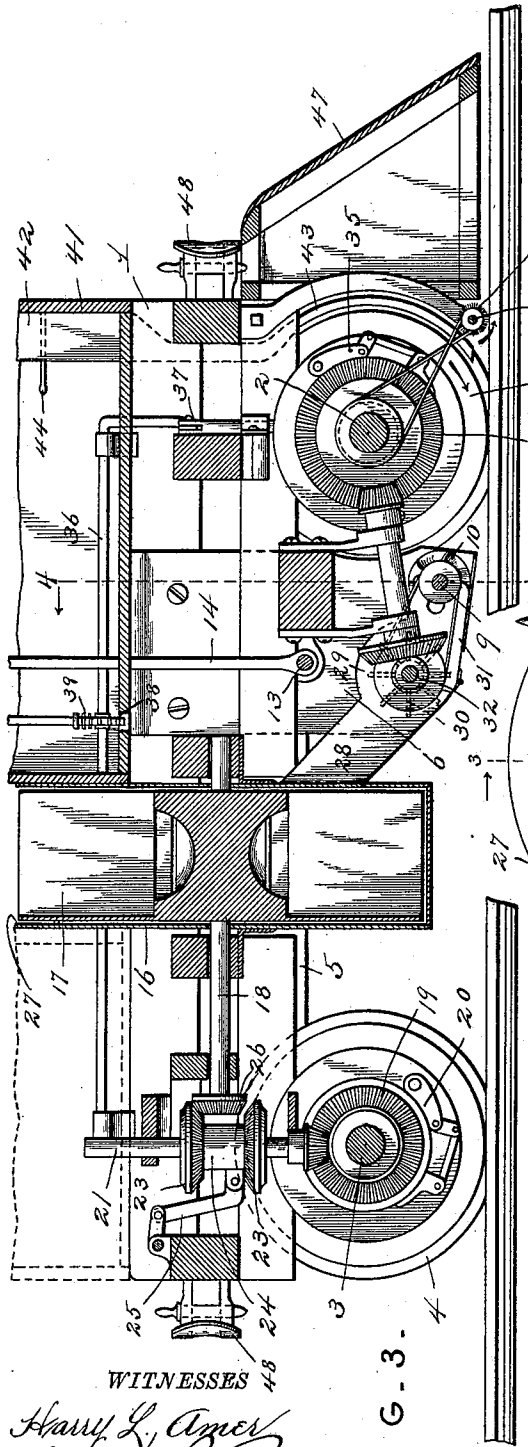


FIG. 3.

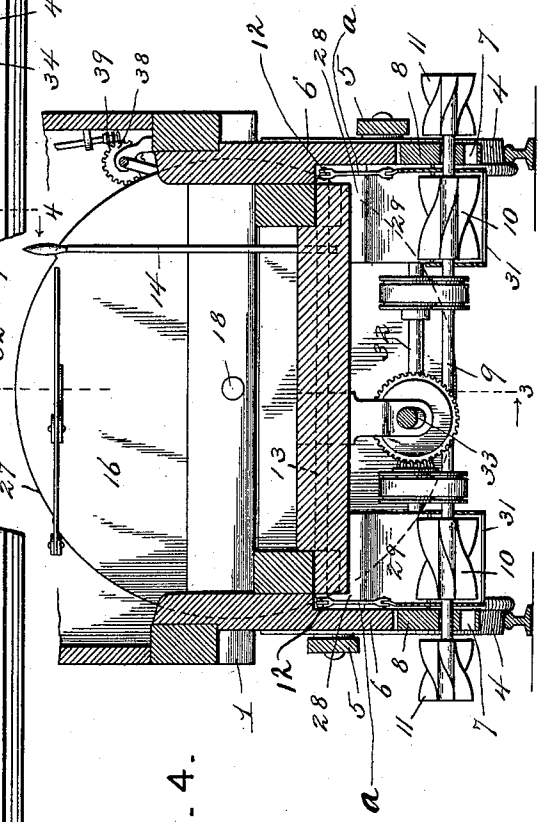


FIG. 4.

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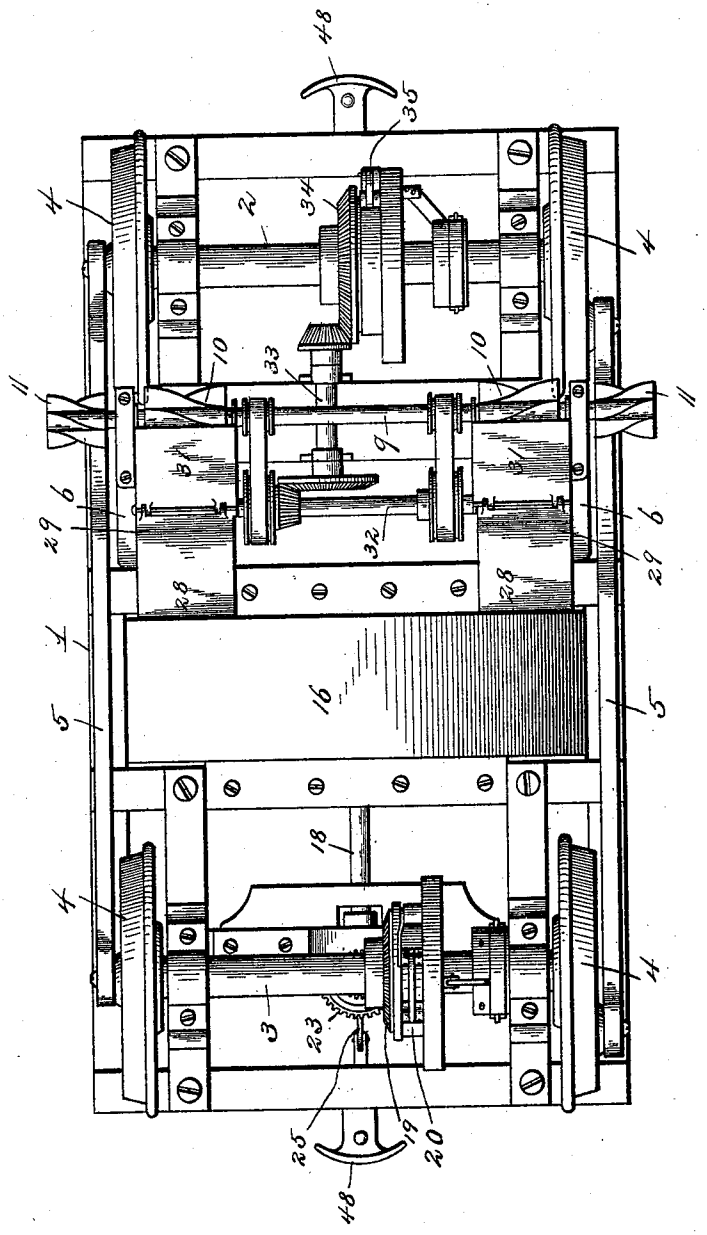
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FIG. 5.



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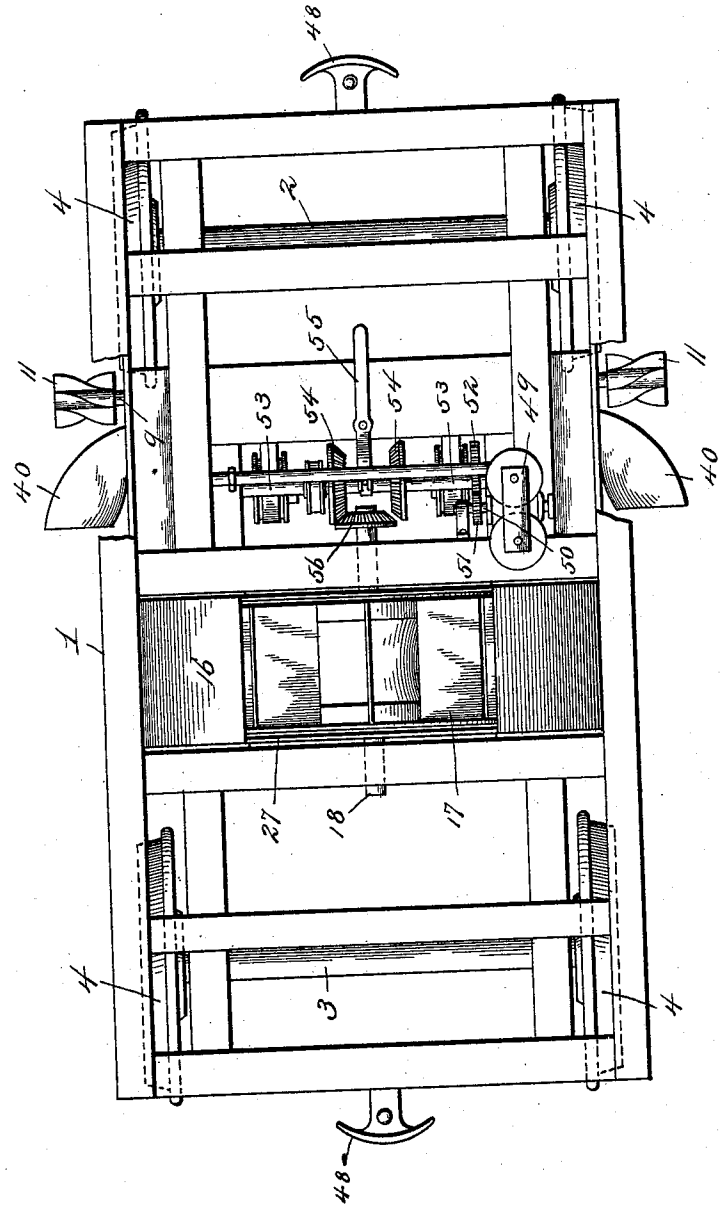


FIG. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM H. BOHNENKAMP AND WILLIAM J. LINDSEY, OF LA GRANDE, OREGON; SAID LINDSEY ASSIGNOR TO WILLIAM ERICSON, OF SAME PLACE.

FLANGER.

SPECIFICATION forming part of Letters Patent No. 590,677, dated September 28, 1897.

Application filed November 10, 1896. Serial No. 611,659. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. BOHNENKAMP and WILLIAM J. LINDSEY, citizens of the United States, residing at La Grande, in the county of Union and State of Oregon, have invented certain new and useful Improvements in Flangers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to a novel construction in what is known as a "flanger" or a machine intended for use upon railroad-tracks for the purpose of cutting ice and snow away from the inner edge of the rails to allow the flanges of the wheels of the rolling-stock to engage the inner edge of the rail-flange.

The invention consists in the features of construction hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front end elevation, partially in section, of a flanger constructed in accordance with this invention. Fig. 2 is a similar view taken at the rear end of the machine. Fig. 3 is a longitudinal section taken on line 3 3 of Fig. 4. Fig. 4 is a transverse section taken on the line 4 4 of Fig. 3. Fig. 5 is a bottom plan. Fig. 6 is a plan view of a modified construction embodying this invention.

Referring now to said drawings, 1 indicates the body of the machine, constructed in any suitable manner and provided with front and rear axles 2 and 3, said axles having wheels 4 to run upon the rails of the track, said wheels being connected by rods 5 to cause them to move in unison. In the rear of the front wheels 4 are the depending hangers 6, having guide-slots 7 therein to receive the sliding bearing-blocks 8 of the cutter-shaft 9. The said guide-slots 7 are curved so that the path of the shaft 9 and bearing-blocks 8 is the arc of a circle whose center is a shaft through which power is transmitted to this shaft 9. The said shaft 9 is provided with four cutters—namely, the inner cutters 10, adapted to cut the ice and snow from the inner side of the rail-flange, and the outer cutters 11 to act upon the outer sides of the rail-flange—it being noted that the distance between these cutters is approximately the width of the head of the rail. The cutters, it will be seen, are movable vertically, so that they can be allowed to pass over the railroad or road-crossings and switches, and to control the movement of the cutters the said blocks are connected by means of links *a* with the outer ends of the arms 12, that are rigid with a rock-shaft 13, that can be turned by a handle 14 or by power—for instance, a cylinder and piston—connected with said handle and controlled by the air-brake apparatus of the engine. In this way the cutters can be controlled by the engineer, or if the engine with which the machine is connected is not provided with air-brakes these cutters can be raised and lowered by said handles 14.

Between the front and rear axles of the machine there is a transverse fan-casing 16, provided with a rotatable fan 17, having a rearwardly-projecting power-shaft 18, that is geared to the rear axles of the machine. In the instance illustrated the gearing between the said shaft 18 and axle 3 consists of the beveled gear 19 upon said axle, to be thrown into or out of gear therewith by the clutch 20. The upright shaft 21 is provided at its lower end with a gear-pinion and is geared to the said fan-shaft 18. The gearing between the upright shaft 21 and fan-shaft 18 consists of the oppositely-facing bevel-gears 23, carried by sleeve 24, sliding upon said upright shaft 21 and rotating therewith. The lever 25 is connected with said sleeve to move the same upon the shaft to throw either of the gears 23 into mesh with the bevel-gear 26 on the shaft 18. In this way it will be seen that the fan can be turned in either direction, so as to throw the snow and ice to either side of the track through the opening 27 in the fan-casing.

Extending through either side of the front end of the fan-casing 17 are the downwardly-inclined passages 28, communicating at their lower ends with small fan-casings 29, having fans 30 therein. These fans 30 are located immediately in the rear of the inner cutters 10, and to the lower ends of the fan-casings 29 are secured the movable shoes 31. These shoes 31 are pivoted to the fan-casings, while

their outer ends engage the cutter-shaft 9, so that as the said shaft moves up and down the shoes 31 will move in an obvious manner. These fans 30 are secured to the shaft 32, passing through the fan-casings and mounted at their outer ends in bearings in the depending hanger 6, and the said shaft 32 is geared to the cutter-shaft 9, so that these shafts rotate in the same direction. The devices for rotating the said shaft 32 consist of a short shaft 33, geared to the shaft 32 and to a bevel-gear 34 on the front axle 2. The said bevel-gear 34 is controlled by a clutch 35 upon said axle and causes said bevel-gear to turn with the axle or to remain stationary. This said clutch 35 and the clutch 20, controlling the movement of the fan-shaft 18, are operated by means of a rock-shaft 36, having crank-arms 37, connected with the clutch for moving the same by reason of the rotation of the said rock-shaft 36. The said rock-shaft 36 is turned by a worm-wheel 38 and worm 39, so that the clutches can be operated with certainty and will remain in the position in which they are placed.

It will be seen from the foregoing description that the rotation of the cutters and the fans are controlled by the clutches 20 and 23, and it is preferred to employ clutches in which the clutch-bands are lined with wood, so that the starting and stopping of the fans and cutters are gradual, and in this way by means of the mechanism simultaneously operated the stopping of the cutters and fans can be regulated independently of the speed of the machine.

It will be seen, of course, that by reason of the fans the snow and ice removed by the inner cutters is carried away, and although it is feasible to employ curved blades for these cutters that will throw the snow and ice to one side, which will be useful in connection with the outside cutters, yet the deflecting-blades 40 can be employed, which are situated adjacent to the outer cutters 11, to throw the snow and ice to one side away from the track. It will be understood, of course, in this connection that the blades of the cutters can be in any shape and form desired; but this does not form a part of the invention. It is preferable to construct a cab 41 over the front end portion of the machine, in which the crew or operator can stand, and, if desired, a cab can be built over the rear end, as shown in dotted lines. Situated within the cab at the corners of the same are the sand-boxes 42, having downwardly-projecting spouts 43 and the valves 44 for controlling the outlet of the sand. Situated in front of the wheels of the front axle are the rotatable brushes 45, mounted upon a shaft 46, that is geared to the front axle 2 in any suitable manner, as shown. These brushes 45 serve to clean the soft snow and ice from the track, or other matters, so that if it is necessary to sand the track to permit the wheels to gain sufficient traction the rails will be as clean as it is possible to have them. In front of these rotatable brushes it is intended to secure snow-plows 47, of the general form and shape of the ordinary pilot snow-plows, which serve to remove soft or light snow and coal or other matters that may fall upon the rail and which would injure the cutters.

A machine constructed in this manner can be either drawn or pushed by an engine and will be of sufficient weight to cause the necessary traction between its wheels and the rails to operate the cutters and fans, and in said drawings are shown the couplings 48 at each end, by means of which it can be connected with the locomotive. One of the principal advantages that is claimed for this machine over former machines used for this purpose is that it may be operated with safety and success upon tracks upon which the ice and snow are clogged in almost any manner, since it can be operated at a low rate of speed, while at the same time it will do the necessary work. With machines heretofore used it has been necessary to run at a high rate of speed to cause the snow and ice to be removed, and therefore they cannot be employed in yards, over switches, on sidings, and the like. This machine, however, can be used in this manner, since it is constructed to work successfully at a low rate of speed, and consequently any part of the track can be cleaned. In some cases the ice and snow are packed so hard against the flange of the track that an engine will be derailed owing to the fact that the flanges of its wheels will not break the ice, but it will be seen that with a machine constructed in accordance with this invention the ice will be effectually removed in an efficient manner.

It will be understood, of course, that in accordance with the principle involved by this invention the cutters and fans can be operated by means of the traction from the wheels of the machine or by a separate motor carried by the machine itself, and to illustrate this last-named construction in Fig. 6 is shown a motor 49, mounted upon the rear end portion of the frame of the machine and geared to the operative parts in the following manner: The shaft 50 of said motor is provided with a gear-pinion 51, that intermeshes with a gear-wheel 52 upon a shaft 53, mounted in bearings upon the frame of the machine and which is provided with the beveled gears 54, slidingly mounted upon said shaft 53 and controlled by the lever 55, whereby either of said beveled gears can be thrown into engagement with the beveled gear 56 upon the fan-shaft 18. The said fan-shaft 53 is geared to the shaft 32, driving the auxiliary fans and the cutters, as will be obvious. In this way it is seen that the rotation of the shaft 53 causes the auxiliary fans and cutters to ride constantly in one direction, or by means of the clutches or beveled gears 54 the rotation of the fan-shaft 18 is reversed.

Having thus described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the kind specified, the combination with the body and running-gear, of rotatable cutters situated inwardly of the wheels thereof, fan-casings in the rear of each of said cutters, fans in said casings, a large fan-casing communicating with each of said first-mentioned fan-casings, a large fan in said fan-casing, and means for rotating said cutters and fans.

2. In a device of the kind specified, the combination with a body and running-gear, of rotatable cutters situated inwardly of the wheels thereof, fan-casings in the rear of said rotatable cutters, fans within said casings, a large fan-casing communicating with each of said first-mentioned casings, a large fan within said large fan-casing, rotatable cutters situated on the outside of said wheels, and means for rotating said fans and cutters.

3. In a device of the kind specified, the combination with a body and running-gear, of rotatable cutters situated inwardly of the wheels thereof, fan-casings situated in the rear of each of said cutters, fans within said casings, a large fan-casing communicating with each of said first-mentioned fan-casings, a large fan within said large fan-casing, rotatable cutters situated on the outside of said walls, deflecting-plates situated in the rear of said cutters that are on the outside of said wheels, and means for rotating said fans and cutters.

4. In a device of the kind specified, the combination with a body and running-gear, of rotatable cutters mounted in upright guides upon said body, devices for raising and lowering said cutters, fan-casings in the rear of each of said cutters, fans within said fan-casings, a large fan-casing communicating with each of said first-mentioned fan-casings, a large fan within said large fan-casing, and means for rotating said fans and cutters.

5. In a device of the kind specified, the combination with the body and running-gear, said body having depending handles provided with upright guide-slots, of rotatable cutters mounted in bearing-blocks situated within said guide-slots, fan-casings situated in the rear of each of said cutters, movable shoes at the lower end of said fan-casings which are flexibly connected to said fan-casings at one end, while at their other end they are connected with the rotatable cutters to move bodily with the latter, fans in each of said fan-casings, a large fan-casing communicating with each of said first-mentioned fan-casings, a large fan in said large fan-casing, means for raising and lowering said guide-blocks, and means for rotating said fans and cutters.

6. In a device of the kind specified, the combination with the body and running-gear, of rotatable cutters and fans, means for rotating said cutters and fans, clutches situated between the source of power and said cutters and fans to control the gearing operating the same, said clutches being connected together to move in unison and devices for operating said clutches, substantially as described.

7. In a device of the kind specified, the combination with the body and running-gear, of rotatable cutters, fan-casings situated adjacent to said cutters, fans within said fan-casings, means for operating said cutters and fans, a large fan-casing communicating with said first-mentioned fan-casing, a large fan within said large fan-casing, means for operating said large fan, and devices to cause said large fan to rotate in opposite directions.

8. In a machine of the kind specified, the combination with the body and running-gear, of rotatable cutters, fan-casings in the rear of each of said cutters, fans in each of said casings, a large fan-casing communicating with each of said first-mentioned fan-casings, a large fan in said large casing, rotatable brushes situated in front of the wheels of the running-gear, and means for operating said fans, cutters and brushes.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

WILLIAM H. BOHNENKAMP.
WILLIAM J. LINDSEY.

Witnesses:
E. W. BARTLETT,
M. J. GOODE.