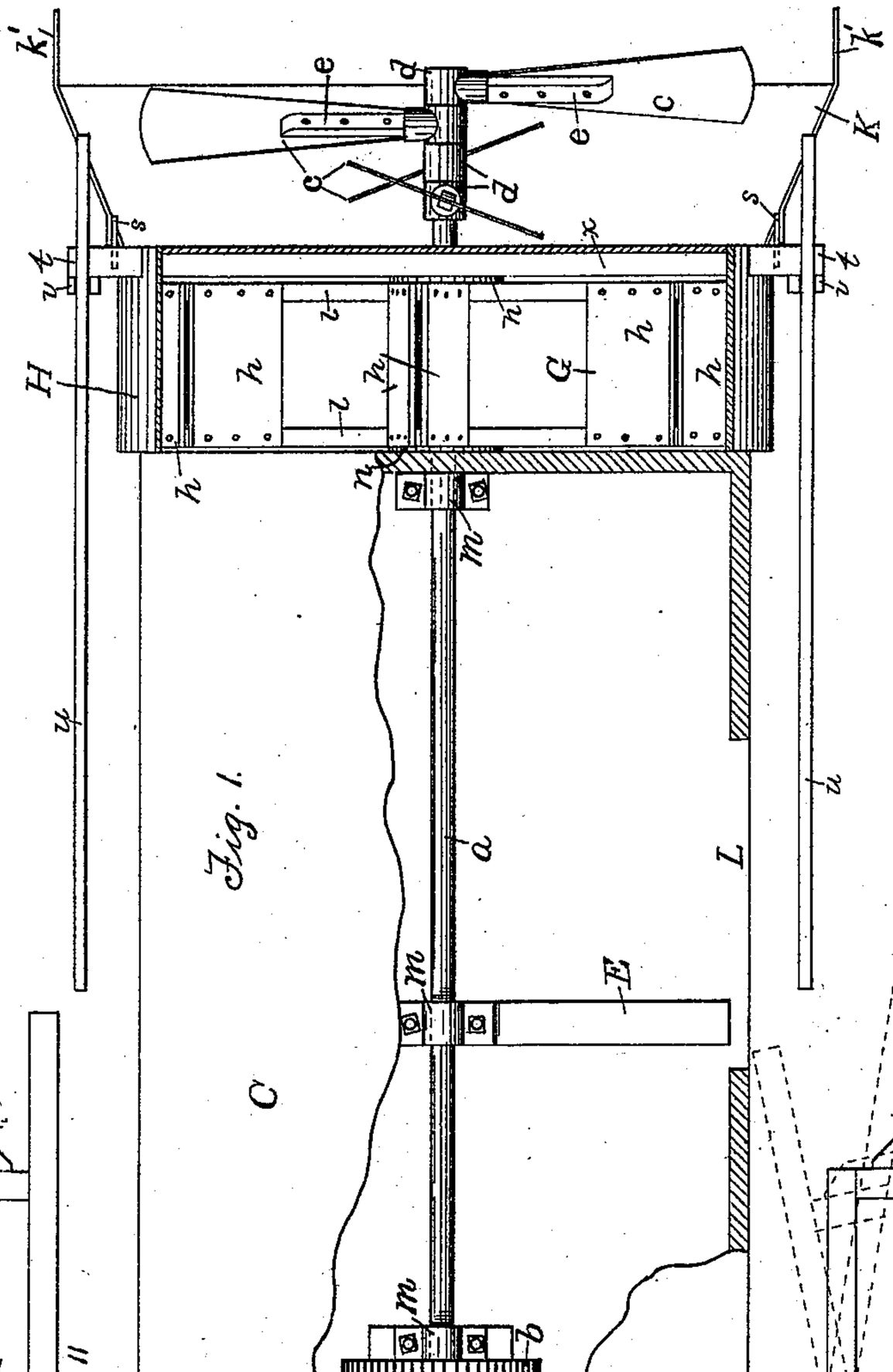
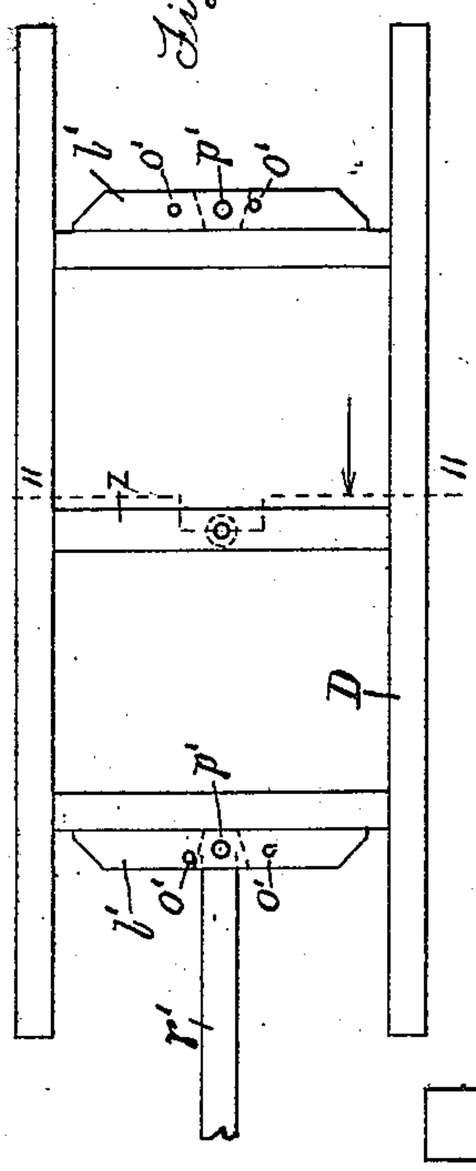
(No Model.) 3 Sheets—Sheet 1.

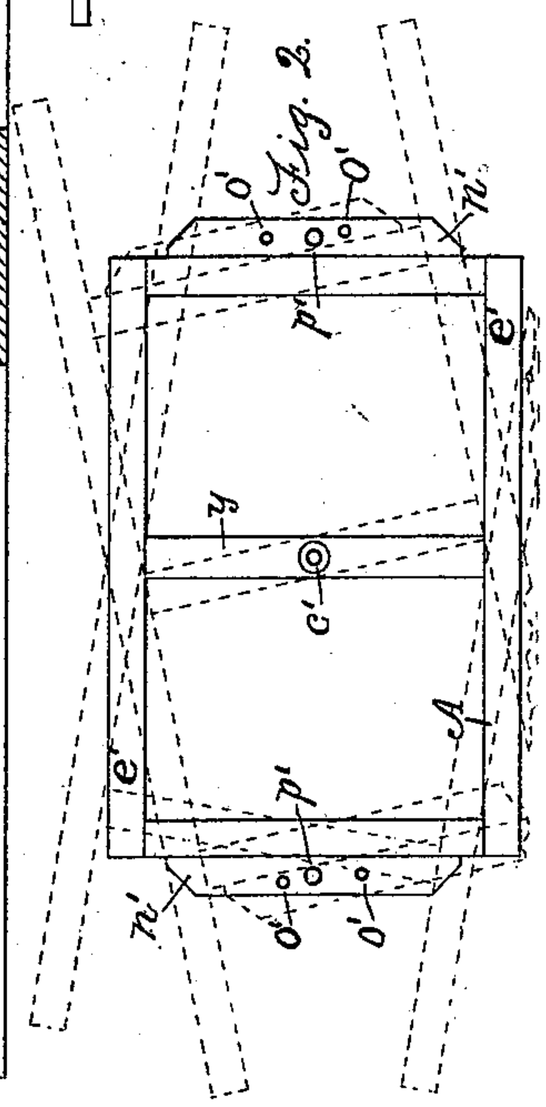
# G. W. RUGGLES.

## TRACK CLEANER.

No. 501,028. Patented July 4, 1893.




Attest:

M. L. Winston.

C. D. Wendle.

Inventor:

G. W. Ruggles.

By E. B. Whitmore,
Atty.

(No Model.)

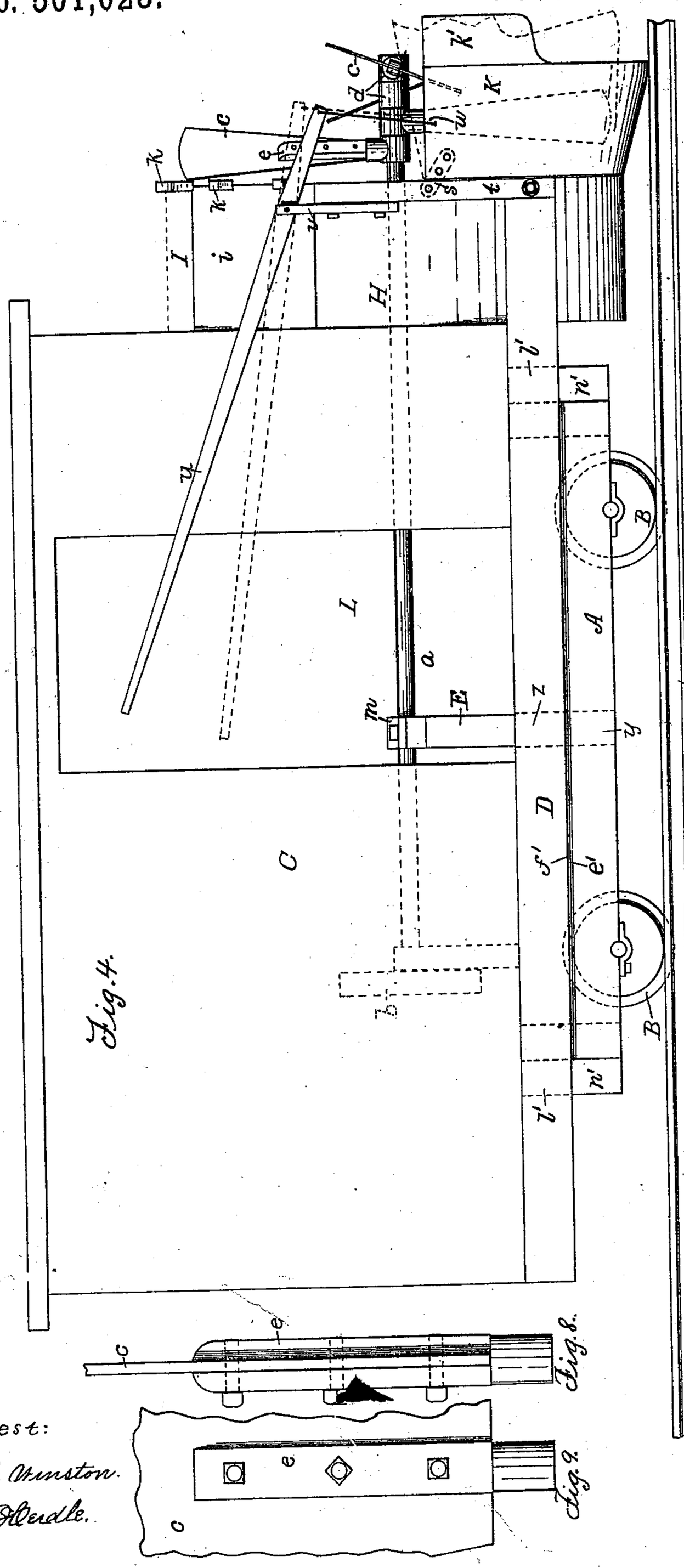
3 Sheets—Sheet 2.

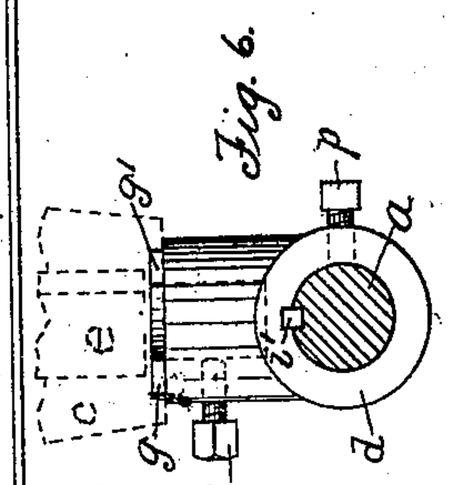
# G. W. RUGGLES.

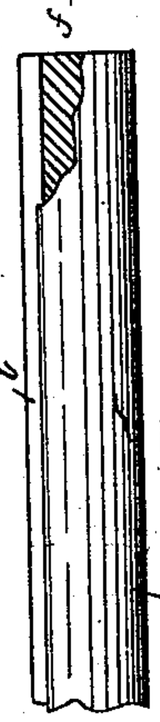
## TRACK CLEANER.

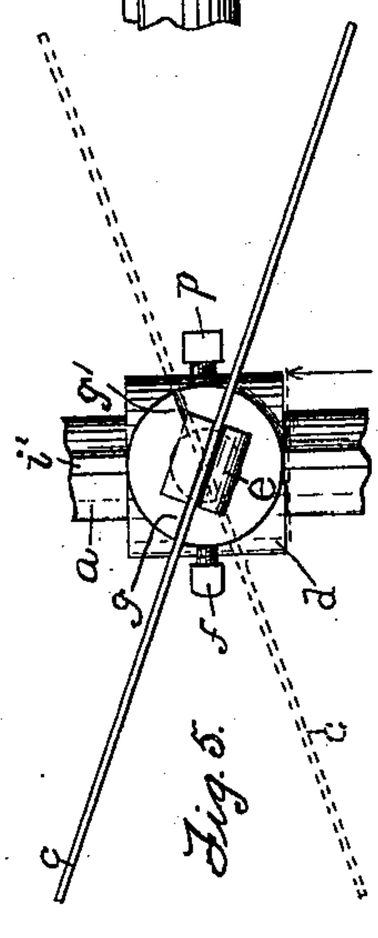
No. 501,028.

Patented July 4, 1893.

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(No Model.) 3 Sheets—Sheet 3.

# G. W. RUGGLES.

## TRACK CLEANER.

No. 501,028. Patented July 4, 1893.

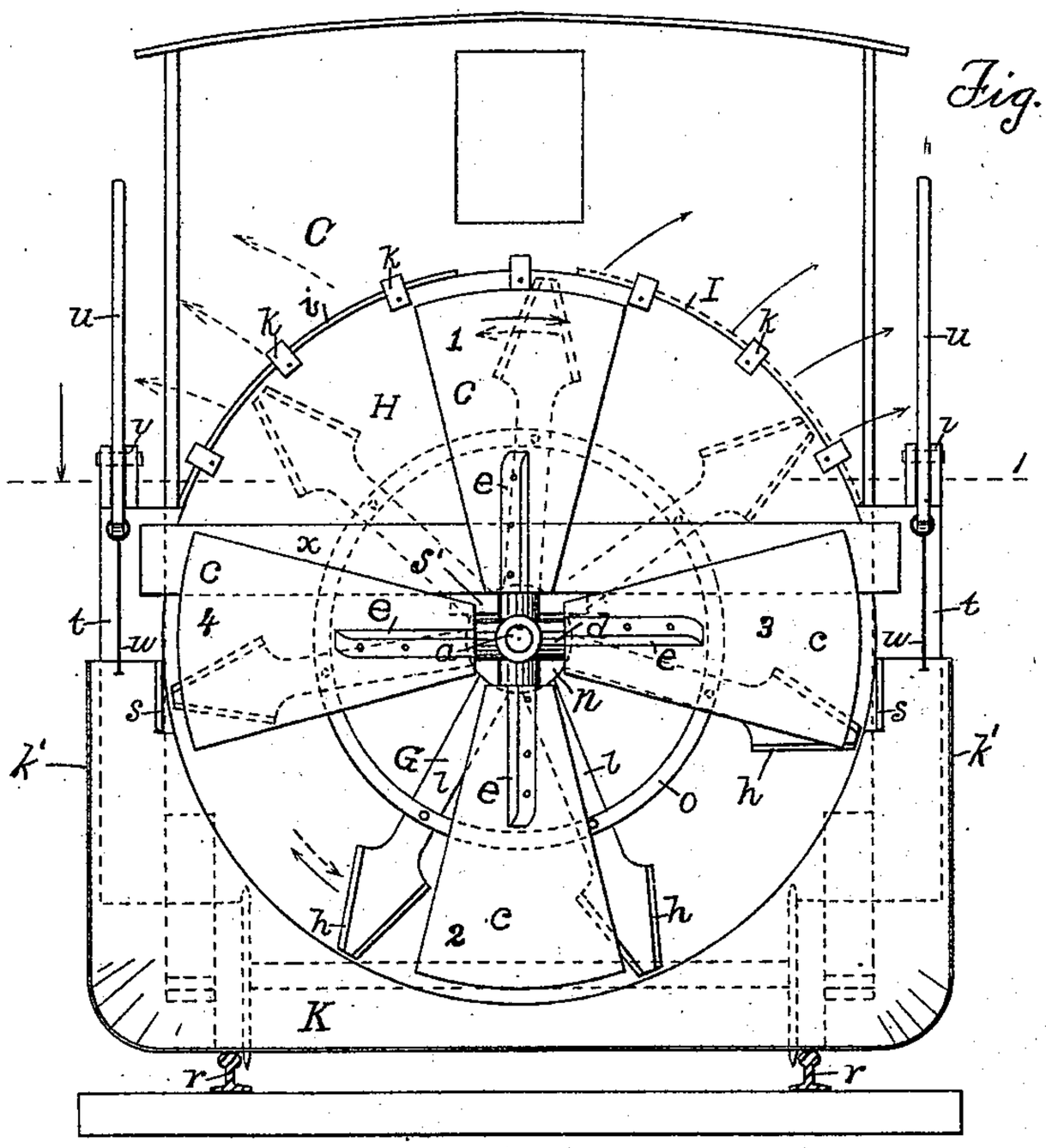

Fig. 10.

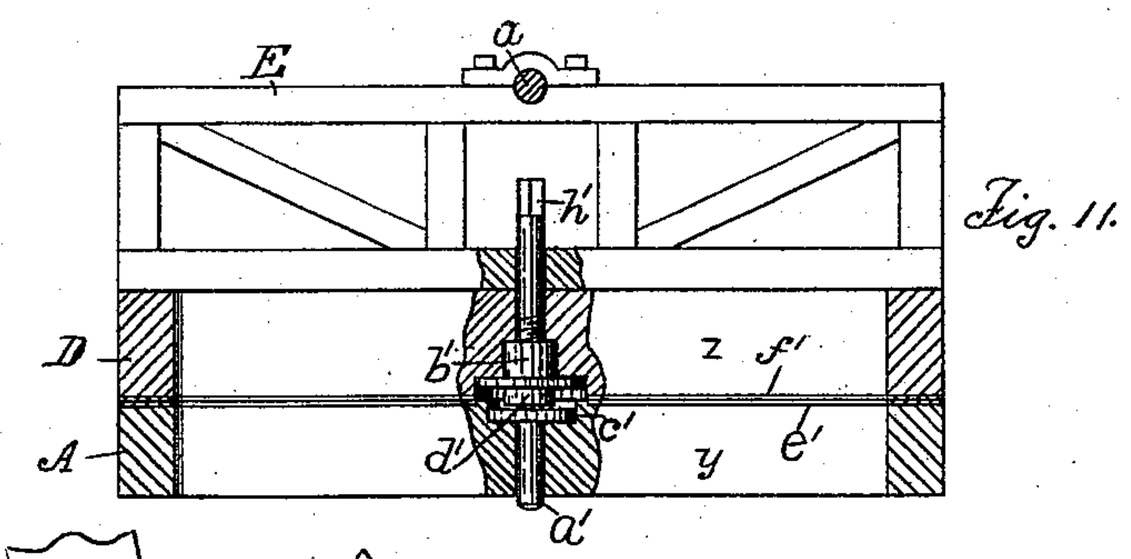

Fig. 11.

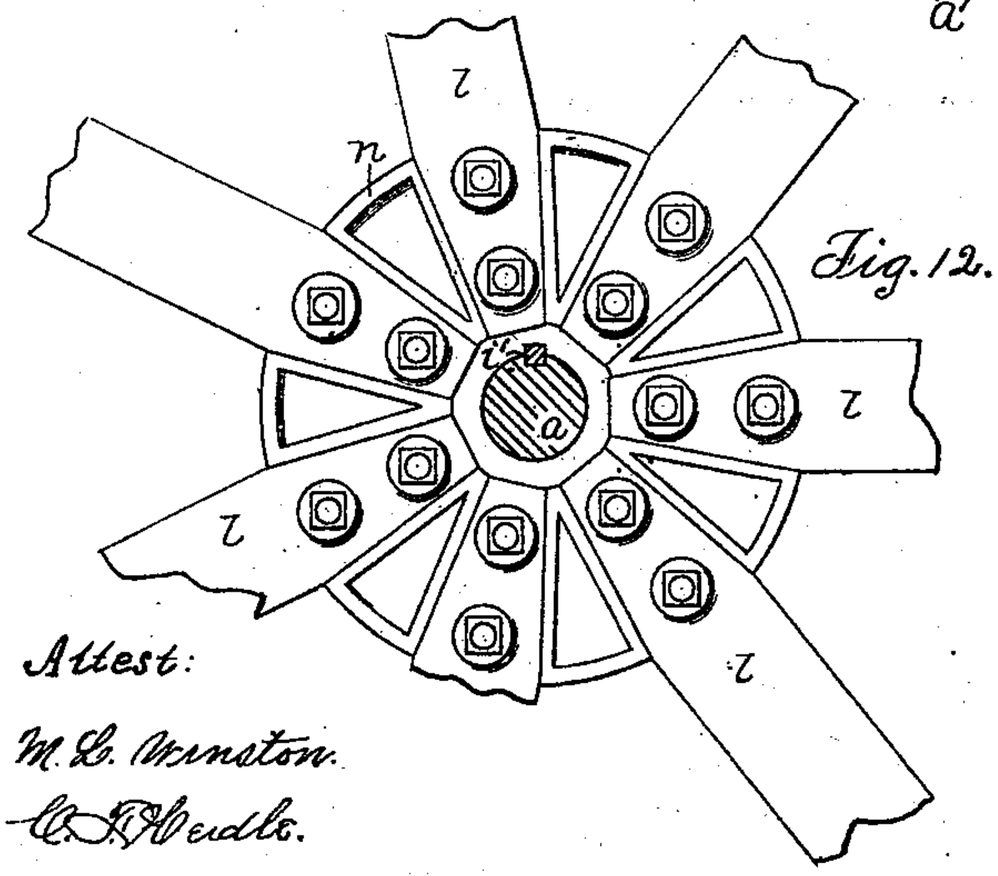

Fig. 12.

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# UNITED STATES PATENT OFFICE.

GEORGE W. RUGGLES, OF CHARLOTTE, NEW YORK.

## TRACK-CLEANER.

SPECIFICATION forming part of Letters Patent No. 501,028, dated July 4, 1893.

Application filed February 27, 1893. Serial No. 463,891. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. RUGGLES, of Charlotte, in the county of Monroe and State of New York, have invented a new and useful Improvement in Track-Cleaners, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention is a device for cleaning snow from railway tracks, consisting of a car provided with a driving shaft carrying a bucket wheel and inclined blades, and a scoop co-acting with the blades and the bucket wheel, the parts and their arrangement and operations being hereinafter fully described and more particularly pointed out.

Referring to the drawings, Figure 1 is a plan of the device parts being broken away and horizontally sectioned on the dotted line 1 1 in Fig. 10. Fig. 2 is a plan of the truck frame, with the superincumbent base frame of the car shown in different positions in dotted lines. Fig. 3 is a plan of the base frame. Fig. 4 is a side elevation of the device, parts being shown in two positions by full and dotted lines. Fig. 5 is a view of a blade and hub, the former shown in its two positions by full and dotted lines. Fig. 6 is a view of the hub seen as indicated by arrow in Fig. 5. Fig. 7 is a side elevation of a part of the driving shaft showing the spline therein. Figs. 8 and 9 show different views of a blade holder. Fig. 10 is a front view of the device. Fig. 11 shows the arrangement for turning the body upon the truck frame, parts being vertically sectioned as on the dotted line 11 11 in Fig. 3. Fig. 12 shows the manner of holding the bucket arms. Figs. 2 and 3 are drawn to a scale smaller, and Figs. 5, 6, 7, 8, 9 and 12 are drawn to scales larger, than that of the general Figs. 1, 4 and 10 and the detail Fig. 11.

Referring to the parts shown, A is the truck frame, mounted on flanged track wheels B of common construction.

C is the body of the car or vehicle, within which the motor for driving the track-cleaning mechanism, and, it may be, for propelling the car itself, is placed. The car is formed with a stout base frame, D, of timbers or metal, which rests upon the truck frame, as shown in Figs. 4 and 11. The snow-clearing mechanism is held upon the front end of the car, as shown in the figures, and operated by means of a shaft *a*, held longitudinally in bearings *m*, in the car. To the inner end of this shaft is affixed a wheel *b*, by means of which the shaft may be rotated by any well known means as, for instance, a steam motor or an electric motor, occupying the space F in the rear end of the car.

The snow-clearing mechanism is formed in part of a series of equal shiftable blades *c*, each held independently in a hub *d*, upon the front overhanging end of the shaft *a*. These blades are tapering or fan-shape, made of steel boiler plate, and held by forked jaws or holders *e*, the broadest parts of the blades being farthest from the shaft. The hubs *d* are alike and independent, and placed upon the shaft one forward of another, as shown in Figs. 1 and 2. The axis of each blade is at right-angles with the axis of the shaft, and the blades, which are preferably four in number, are equally spaced around the shaft and preferably placed upon the shaft so that numbers 1 and 2 are vertical, for instance, and numbers 3 and 4 horizontal, numbering in order from the rear blade to the front blade; see Fig. 10. The jaws *e* are inserted in the hubs *d* in circular bearings (see Figs. 8 and 9) so as to turn therein upon their axes to the end that the blades may be shifted as to the lead or direction of inclination, this being clearly shown in Fig. 5. The jaws are held to place in the hubs by ordinary set screws *f*, and the hubs are made rigid with the shaft by means of set screws *p*.

As shown in the figures the hubs *d* are T-shaped; that is to say, each is composed of two cylindrical parts with their axes at right-angles, the shaft *a* occupying the main part while the minor part holds the jaw and its blade. The branch or part of the hub that holds the blade is formed with two shoulders *g g'*, Figs. 5 and 6, against one or the other of which the blade is turned when it is shifted to either of its two positions. This greatly facilitates the setting of the blades to the positions required in any given case and also aids in holding them in place against the resistance or action of the snow as it is being forced back as the blades are revolved by the shaft.

The snow-clearing mechanism is further

formed with a wheel G, consisting of a series of buckets or paddles *h*, secured to the driving shaft *a* immediately in rear of the blades. This wheel is inclosed in a cylindrical box or house H, formed against the front end of the bar body C, concentric with the shaft *a*. The oblique revolving blades cut into the snow as the car advances and crowd it back into the wheel house H from which it is thrown out from centrifugal action by the bucket wheel G, as indicated by arrows in Fig. 10. The convex part of the wheel house is made of sheet iron, a large portion at the upper side being omitted to form a spacious opening I, Figs. 4 and 10, out through which the snow is thrown. This opening is in part covered or regulated by a shiftable circular sheet-iron closer *i*, held to slide in peripheral bearings *k*. Sometimes it is desirable to throw the snow to the right and sometimes to the left, this depending upon circumstances. The shaft with its blades and the paddle wheel are rotated in one direction or the other according to the direction it is wished to discharge the snow; and the closer *i* is shifted to form the opening I at one side or the other, corresponding to the direction in which the snow is to be thrown out.

I form the wheel G preferably of seven pairs of radial arms *l*, carrying seven double-faced buckets *h*, as shown in Fig. 10. These arms are held at their inner ends in flanged hubs or spiders *n*, secured to the shaft *a*, clearly shown in Fig. 12, there being two of these spiders facing each other. A stiffening circular band *o*, is secured to the arms at either side of the wheel to support them in case an unusual strain is at any time brought upon one or more of the buckets. The spiders are secured to the shaft *a* by ordinary means as common set screws, for instance; and, besides, a longitudinal spline, *i'*, Fig. 7, is supplied to the shaft which passes through the spiders and all the hubs *d* of the blades, as appears in Figs. 5, 6 and 12.

It is found in practice that the buckets do better service in throwing snow from the wheel house when placed inclined to the radii of the wheel or to correspond to cords of the circle, than if made radial. As shown, the inner edge of each bucket is in advance of the outer edge, a form which tends to urge the snow outward against the circumferential part of the wheel house when the wheel turns, and causes it to quickly escape through the opening I when brought around to said opening. Now, by expanding the outer ends of the arms and forming them tapering or spear-shaped, as shown in Fig. 10, I am enabled to provide each pair with two oppositely-faced buckets of equal inclination. When thus constructed the wheel will work equally well when turning in either direction. These buckets occupy planes parallel with the axis of the shaft *a*, and they consist of stout boards or of pieces of sheet metal bolted to the arms.

The rear vertical wall of the wheel house is imperforate save as to the central opening through which the shaft *a* passes. The front of the wheel house is formed with a horizontal cross-tree *x*, Figs. 1 and 10, a short distance above the shaft, held by standards *t*, rigid with the base frame D. Above this cross-tree the front side of the wheel house is closed; but below the cross-tree the wheel house is open, through which opening the snow is crowded into the wheel house by the action of the revolving blades, as above stated. This snow-clearing mechanism is further provided with a sheet metal scoop K, in front of the wheel house, and below and partly surrounding the blades. This scoop is preferably formed substantially rectangular and flaring, with vertical sides, horizontal lower part and rounded lower corners, as shown in Fig. 10. When the machine is in operation the lower edge of the scoop rests upon or just clears the rails *r*, of the track, as shown in Figs. 4 and 10. The scoop is hinged at its upper side by means of straps *s*, to the standards *t*. Levers *u*, one at either side of and parallel with the car body, are held in rests *v*, of the standards, having their forward short arms connected with the scoop by chains or cables *w*. The car body is formed with a door L, at either side and the long ends of the levers pass these doors in convenient reach of persons in the car operating the machine. By means of these levers the scoop may be temporarily tilted or raised, as shown by dotted lines in Fig. 4, to pass over obstacles that may project above the level of the track. The rear edge of the scoop is contracted and curved to meet the adjacent edge of the wheel house so as to conduct the snow into the wheel house when urged backward by the inclined blades.

Much of the resistance encountered in pushing the track-cleaner when at work arises from forcing the lower edge of the scoop against the dense snow. On account of this I have found it better in practice to have the outer blade act in advance of the scoop so as to, in part, break up and loosen the snow before the scoop gathers it in. I have found also that when the leading blade strikes into the surface of the unbroken snow, particularly when crusted over, it sometimes breaks up masses that extend laterally beyond the line of the advancing scoop, which masses are liable at times to fall back under the car when the scoop passes. To obviate this difficulty I construct the scoop with advance parts or wings *k'*, Figs. 1 and 4, which lead the forward blade and, cutting into the surface of the snow on each side, prevent the latter from breaking up outside of the kerfs or partings they form. The vertical depths of these wings is a matter of judgment, they being useful only in deep snow. It is understood that the blades are shifted to incline in one direction or the other, as above described, according to the direction in which the shaft *a* is rotated.

This track-cleaning device is made a "dou-

ble-ender;" that is to say, all of the mechanism above the truck frame is constructed to be swung around horizontally upon a central bearing. This enables the device to be run one way or the other upon the track to clear the latter, without having to resort to the use of a turn-table. The truck frame is formed with a stout central cross beam *y*, Fig. 2, and the base frame D is formed with a corresponding beam *z*, Fig. 3, directly over the beam *y*. Midway through these beams a vertical threaded bolt or shaft *a'*, Fig. 11, passes, upon which the superstructure turns.

*b'* is a threaded part or nut for the bolt, let into the under side of the beam *z* and secured thereto.

*c'* is an annular plate let into the upper surface of the beam *y*, through which the bolt *a'* passes.

*d'* is an enlargement of the bolt which, when the latter is turned down, bears against the plate *c'* and tends to lift the weight of the car off of the truck frame. When thus lifted the car is easily swung round horizontally upon the truck frame to reverse it. The beam *z* of the car is strengthened by a transverse truss E, Figs. 1, 4 and 11, resting directly upon it, up through the lower part of which the pivot bolt *a'* passes. This truss also assists to support the driving shaft *a*. The upper end, *h'*, of the bolt is squared to receive a wrench with which to turn it.

The upper surface of the truck frame is faced with iron, *e'*, and the under surface of the base frame D is similarly faced with iron strips *f'*, which two iron-clad faces are in contact.

The scoop is made somewhat wider than the car so that when cutting through deep snow an opening will be made wide enough to let the car pass through without touching the sides. Usually a wider opening is required finally, but it is desirable, particularly where there are heavy drifts of packed snow to remove, to cut first an opening just wide enough to let the car pass through easily and then widen out this opening by subsequently cutting away the snow at both sides thereof. To effect this I have arranged the device to be swung moderately to one side or the other so as to offset the snow-clearing apparatus as indicated by the positions of the base frame of the car shown in dotted lines in Fig. 2. This enables me to cut away the snow successively at the two sides of the original opening so as to widen out the latter. The device might be arranged to have the body of the car shifted bodily toward one side or the other of the truck frame for this purpose; but as this would throw the machine considerably out of balance I prefer to swing the body upon a central bearing upon the truck frame, as above described. To cut the whole width of opening through compact snow at one operation would throw too much work upon the parts and cause the progress of the device through the snow to be too slow. By cutting a narrow opening first the device can be moved quite rapidly and so open up the road for traffic, while the side cutting of the snow, above described, can be done at leisure.

I usually bolt timbers *l' l'* and *n' n'*, to the respective frames D and A, Figs. 3 and 2, the timbers *l' l'* being directly over *n' n'*. These timbers I pierce with vertical holes *o'*, through which to pass simple iron pins which form stops to hold the car body in its offset positions. These holes may be bored in such a manner that the snow-clearing mechanism may be thrown to one side or the other to a greater or less distance, as may be desired. The pieces *l'* are also formed with central horizontal openings through which vertical holes *p'*, are bored to receive the ordinary draw pin or coupling pin for connecting the device with another car or motor, a draw bar *r'*, of common kind in railway practice being used.

The shaft *a* is provided with a bearing *u'*, Fig. 10, at the under side of the cross-tree *x*, between the blades and the bucket wheel.

What I claim as my invention is—

1. A snow-clearing device for railways, consisting of a car provided with a driving shaft and means to rotate it, a bucket wheel secured to the driving shaft in front of the car, and a wheel house for the bucket wheel, in combination with a series of blades secured to the shaft in front of the bucket wheel each held in an independent hub and arranged one forward of another on the shaft, the axes of said blades being at right-angles with the shaft, substantially as shown and described.

2. A snow-clearing device for railways, consisting of a car or vehicle having a shaft, a bucket wheel secured to said shaft in front of the car, and a wheel house for the bucket wheel, in combination with a series of inclined blades on the driving shaft in front of the bucket wheel, the wheel house having an opening next the blades and a circumferential opening, with means to rotate the shaft, the blades being held in hubs on the shaft and made shiftable in the hubs, substantially as and for the purpose set forth.

3. A device for clearing snow from railway tracks, consisting of a car or vehicle having a longitudinal shaft, a bucket wheel on the shaft forward of the car, and a house for the bucket wheel, in combination with a series of inclined blades mounted in independent hubs on the shaft forward of the bucket wheel, the blades being shiftable in the hubs and the latter being formed with shoulders or stops to control the positions of the blades, with means to drive the shaft, substantially as shown and described.

4. A device for clearing snow from railway tracks, consisting of a car or vehicle having a longitudinal rotatory shaft, a bucket wheel on the shaft forward of the car, and a house for the bucket wheel, in combination with a series of blades on the shaft forward of the bucket wheel, with means to drive the shaft,

the bucket wheel being formed with radial arms having tapered or spear-shaped ends and buckets secured to said tapered ends to face in opposite directions, substantially as and for the purpose set forth.

5. A snow-clearing device for railways, consisting of a car body mounted upon a truck frame, said body having a longitudinal rotatory shaft, a bucket wheel on the shaft forward of the car, and a house for the bucket wheel, in combination with inclined blades on the shaft co-acting with the bucket wheel, and means to drive the shaft, said car body and the truck frame being formed with a mutual center-bearing, substantially as and for the purpose set forth.

6. A snow-clearing device for railways, consisting of a car body mounted upon a truck frame and having a longitudinal rotatory shaft, a bucket wheel on the shaft forward of the car, and a house for the bucket wheel, in combination with inclined blades on the shaft co-acting with the bucket wheel, and means to drive the shaft, said car body and the truck frame being faced with iron at their adjacent parts and joined by a central pivoted bolt or bearing, substantially as shown and described.

7. A snow-clearing device for railways, consisting of a car body mounted upon a truck frame, said body having a longitudinal rotatory shaft, a bucket wheel on the shaft forward of the car, and a house for the bucket wheel, in combination with inclined blades on the shaft co-acting with the bucket wheel, and means to drive the shaft, said car body and the truck frame being joined by a threaded swivel bolt, a threaded nut for the bolt held by the car body, and a plate in the truck frame beneath said nut, the bolt being provided with an enlarged part to bear upon said plate, substantially as shown and for the purpose set forth.

8. A device for clearing snow from railway tracks, consisting of a car body mounted upon a truck frame and having a longitudinal rotatory shaft, and a bucket wheel on the shaft forward of the car, in combination with inclined blades held by the shaft to co-act with the bucket wheel, and means to drive the shaft, the car body being adapted to turn horizontally upon the truck, and stops to hold the car body in different positions relative to the truck, substantially as and for the purpose set forth.

9. A snow-clearing device for railways, consisting of a car or vehicle provided with a driving shaft, a bucket wheel on the driving-shaft in front of the car, and a wheel house, in combination with a series of blades on the shaft forward of the bucket wheel, and arranged in order from front to rear, with means to rotate the driving shaft, and a scoop forward of the wheel house having the lower part of its cutting edge back of the cut or sweep of the forward blade and the upper part of its cutting edge, on either side, in advance of said blade, substantially as shown and described.

10. A snow-clearing device for railways, consisting of a car provided with a driving shaft, a bucket wheel on the driving shaft in front of the car, and a wheel house, in combination with a series of blades on the shaft forward of the bucket wheel, arranged in order from front to rear, with means to rotate the driving shaft, and a scoop forward of the wheel house having the lower part of its cutting edge back of the sweep of the forward blade and the upper part of its cutting edge in advance of said blade, said scoop being hinged at its upper side to move in a vertical plane, and levers at the sides of the car connected with the scoop to control it, substantially as shown and described.

11. A snow-clearing device for railways, consisting of a car or vehicle provided with a driving shaft, a bucket wheel on the driving shaft in front of the car, and a wheel house, in combination with a series of blades on the shaft forward of the bucket wheel, with means to rotate the driving shaft, and a scoop forward of the wheel house, said bucket wheel being provided with pairs of arms having double inclined or spear-shaped heads provided with oppositely-faced buckets, substantially as shown and described.

In witness whereof I have hereunto set my hand, this 23d day of February, 1893, in the presence of two subscribing witnesses.

GEORGE W. RUGGLES.

Witnesses:
ENOS B. WHITMORE,
M. L. WINSTON.