

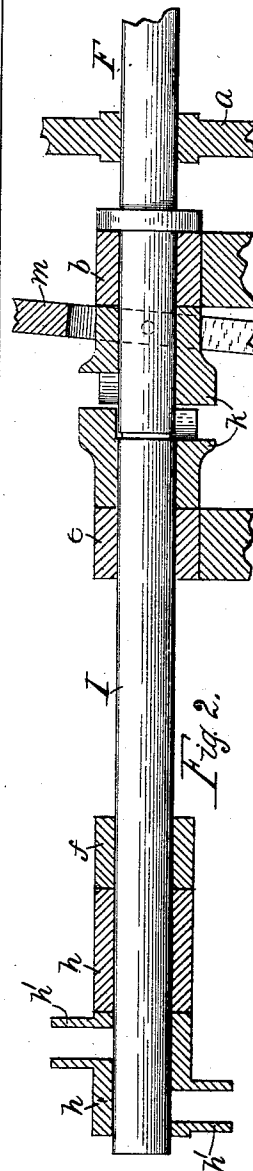
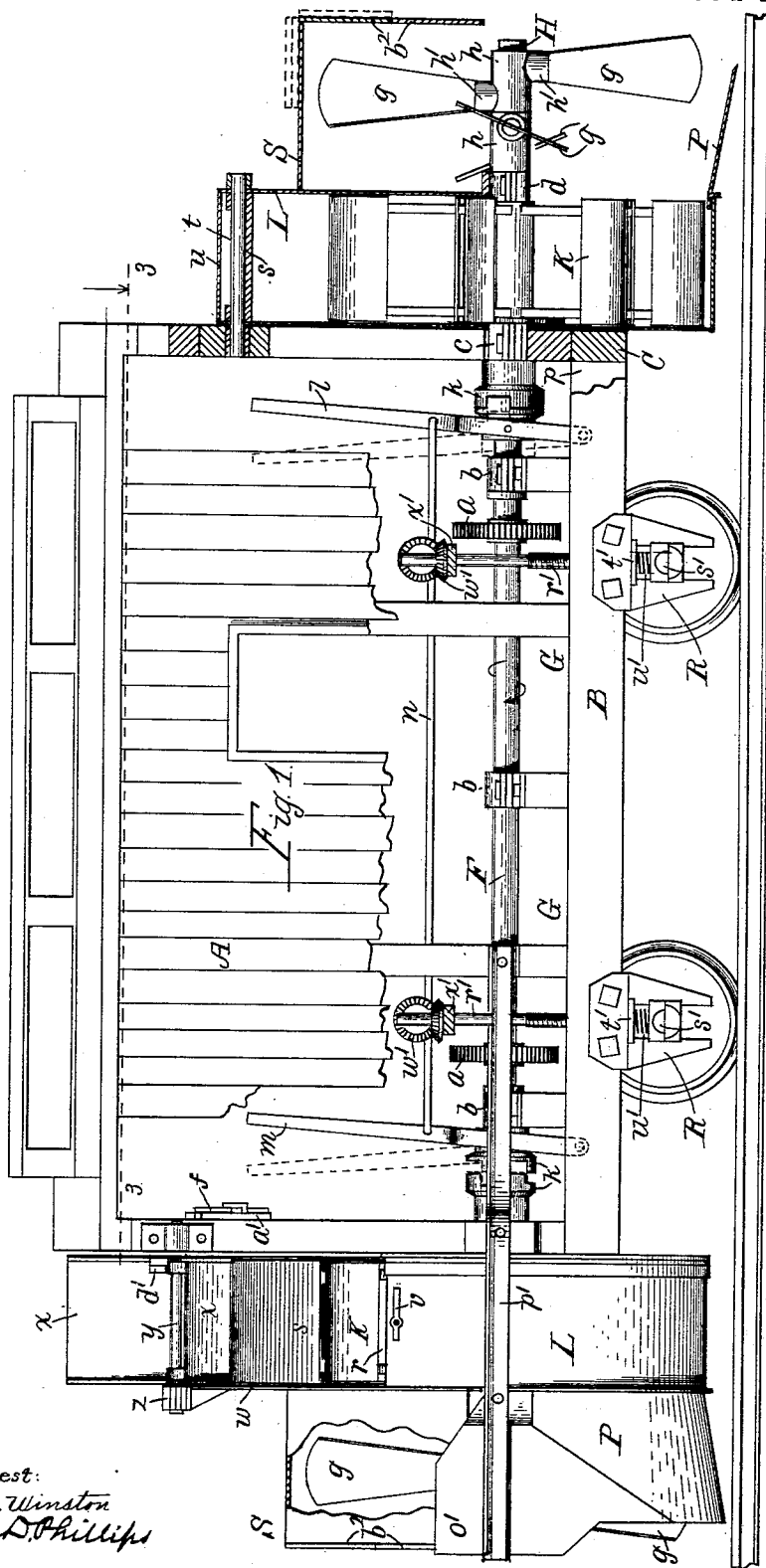
(No Model.)

G. W. RUGGLES.
SNOW PLOW.

4 Sheets—Sheet 1.

No. 580,004.

Patented Apr. 6, 1897.



Attest:
M. L. Winston
M. D. Phillips

Inventor
George W. Ruggles,
By E. B. Whitmore,
Atty.

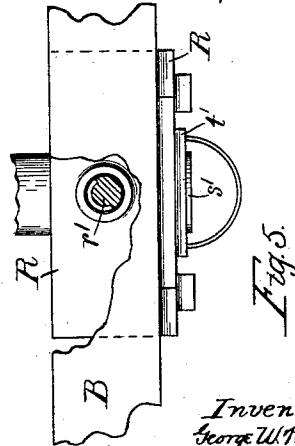
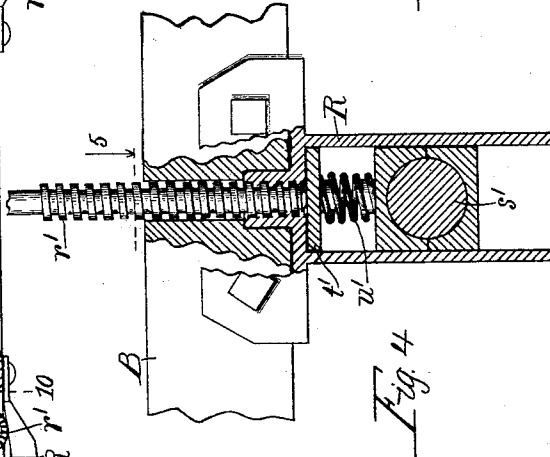
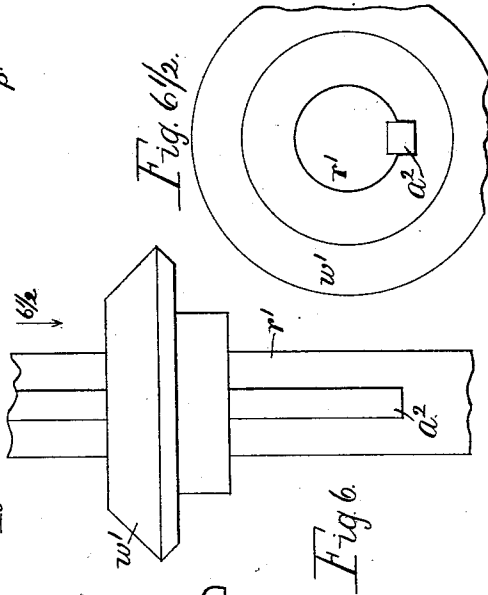
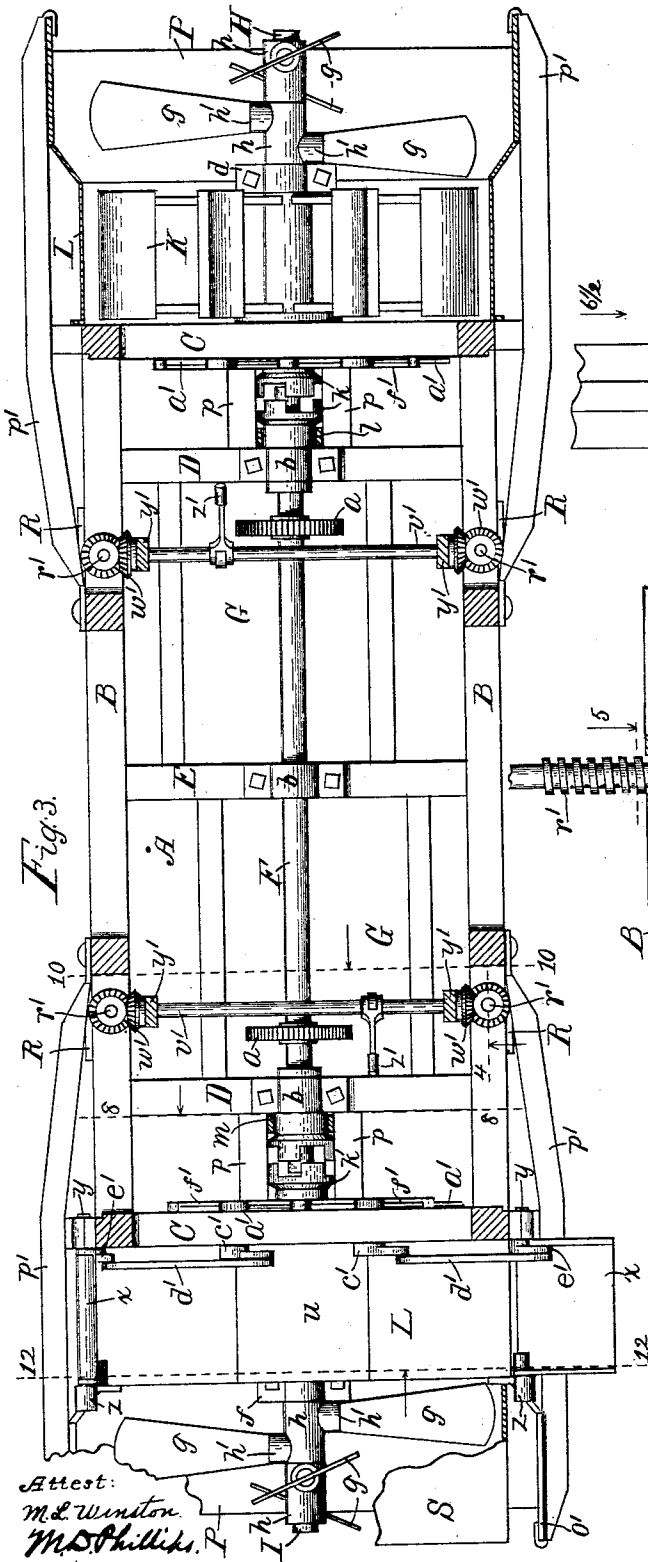
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4 Sheets—Sheet 2.

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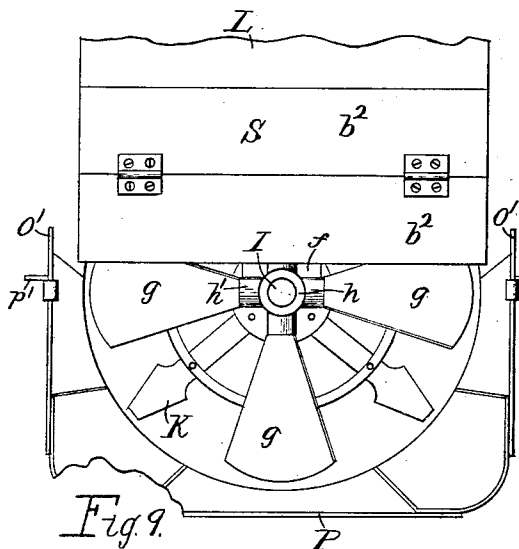
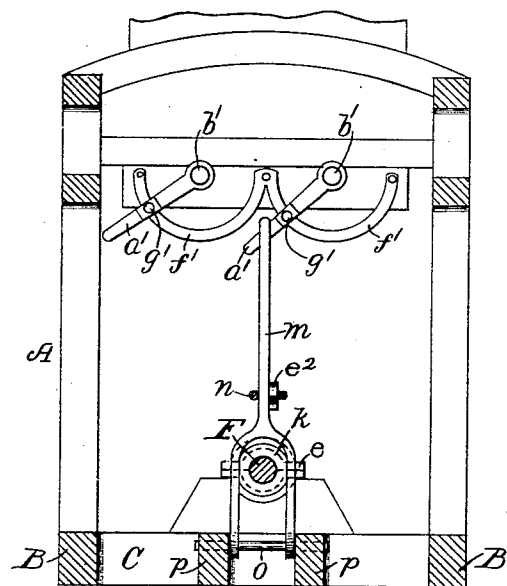
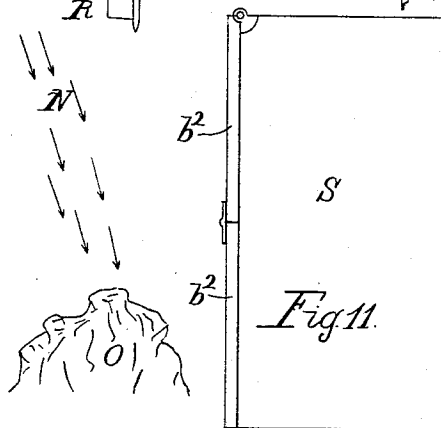
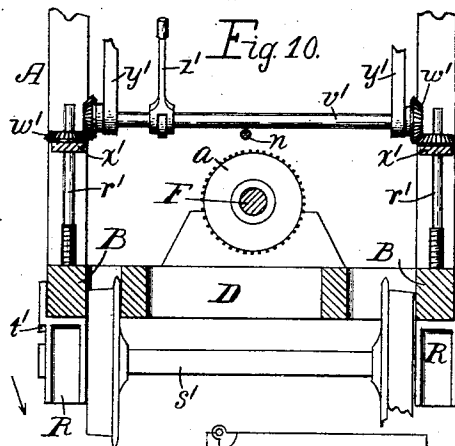
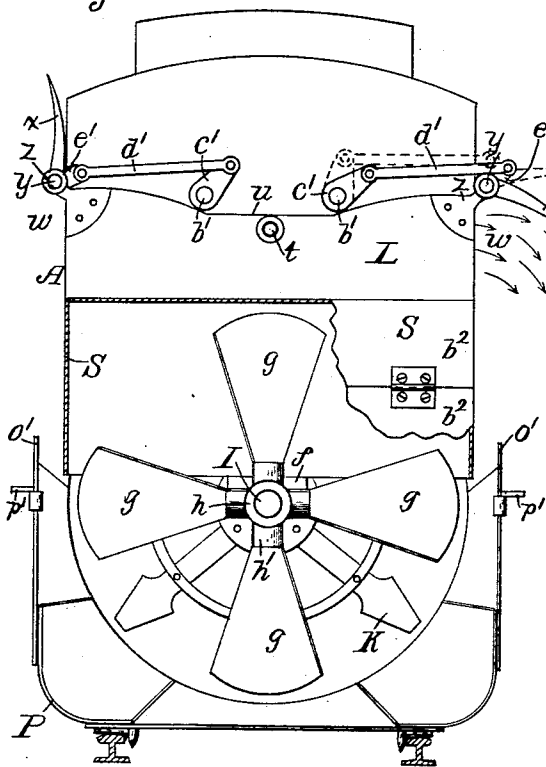


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Fig. 7.



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Fig. 8.

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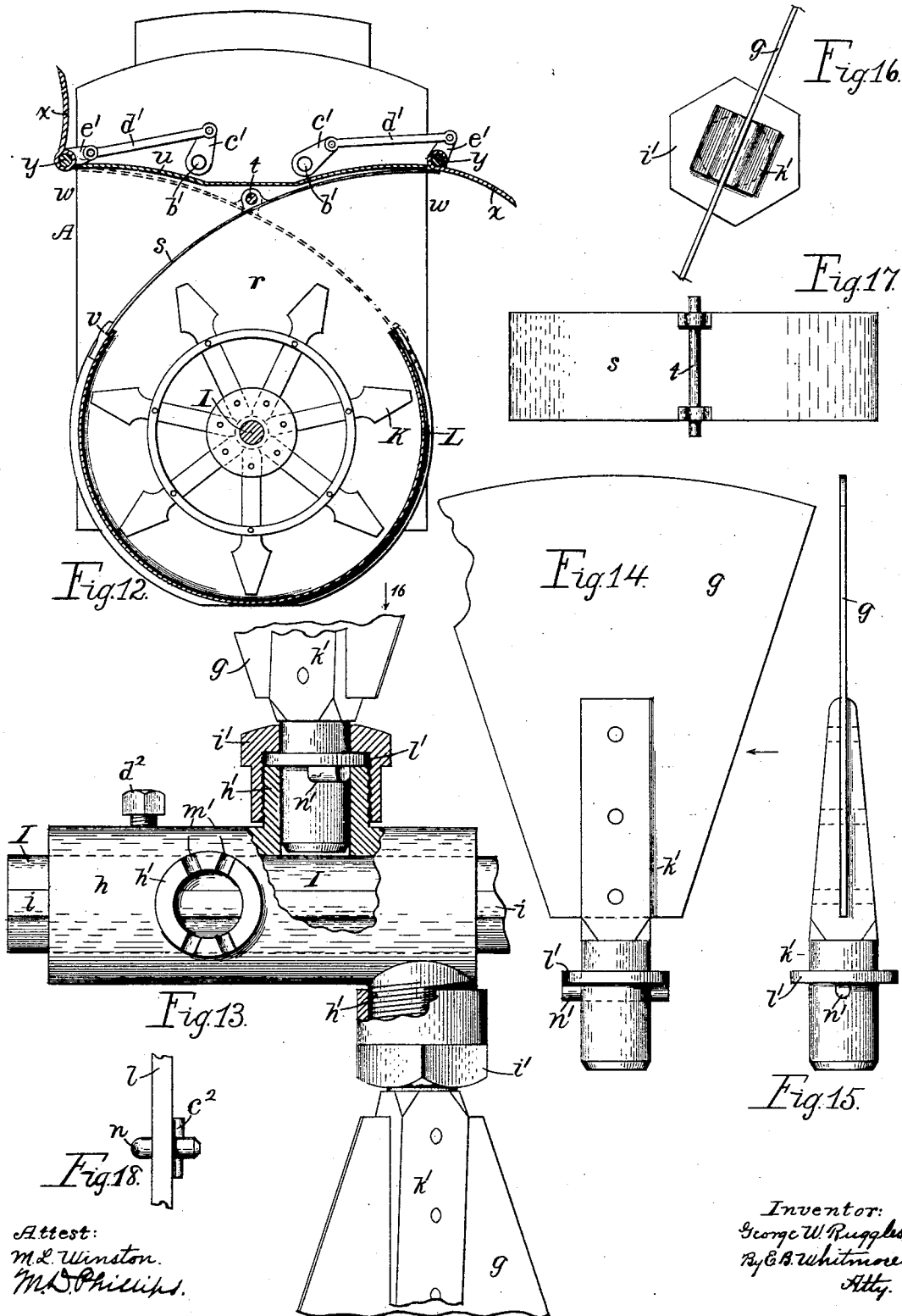
(No Model.)

4 Sheets—Sheet 4.

G. W. RUGGLES.
SNOW PLOW.

No. 580,004.

Patented Apr. 6, 1897.



UNITED STATES PATENT OFFICE.

GEORGE W. RUGGLES, OF CHARLOTTE, NEW YORK.

SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 580,004, dated April 6, 1897.

Application filed October 23, 1896. Serial No. 609,839. (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 Snow-Plows, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

July 4, 1893, Patent No. 501,028 was issued to me for a snow-plow or track-cleaner; and the object of my present invention is to make additions to and improvements on the device shown and described in said Letters Patent.

The present invention relates to various parts of the machine or car and to the construction and arrangement of the machinery carried by the car and in some respects to the general construction of the device, all being hereinafter fully described and particularly pointed out.

Referring to the drawings, Figure 1 is a side elevation of the improved track-cleaner, parts being vertically sectioned and other parts broken away and omitted. Fig. 2 is a vertical longitudinal section of parts associated with the shaft at one end of the car. Fig. 3 is a plan, the frame being horizontally sectioned, as on the dotted line 3 3 in Fig. 1, and other parts sectioned horizontally on various planes, parts being broken away and omitted. Fig. 4 is a vertical longitudinal section of parts about a lifting-screw, taken on the dotted line 4 4 in Fig. 3, parts being broken away. Fig. 5 is a view of parts seen as indicated by arrow 5 in Fig. 4, the screw being sectioned as on the dotted line at the point of the arrow. Fig. 6 is a side view of parts of the lifting device. Fig. 6½ is a view of parts seen as indicated by arrow 6½ in Fig. 6. Fig. 7 is an end view of the machine with some parts vertically sectioned and other parts broken away and omitted. Fig. 8 is a cross-section of the body of the car, taken on the dotted line 8 8 in Fig. 3 and viewed as indicated by arrow pointed on said dotted line, parts being omitted. Fig. 9 is an end elevation of parts of the machine, showing the hood closed. Fig. 10 is a cross-section of the lower part of the car-body, taken on the dotted line 10 10 in Fig. 3 and seen as indicated by arrow pointed thereon, parts being broken away. Fig. 11 is a side

view of a hood for the blades. Fig. 12 is a cross-section of the housing for the wheel and some associated parts, taken on the dotted line 12 12 in Fig. 3, view indicated by arrow. Fig. 13 shows a hub for the blades with some associated parts, parts being broken away and other parts longitudinally sectioned. Fig. 14 is a plan of a blade. Fig. 15 is an edge view of a blade seen as indicated by arrow in Fig. 14. Fig. 16 is a view of a blade and associated parts seen as indicated by arrow 16 in Fig. 13. Fig. 17 is a plan of the shiftable chute. Fig. 18 shows a method of fastening the tie-rod for the clutch-levers. Figs. 2, 4, to 6½, inclusive, and Figs. 13 to 16, inclusive, and Fig. 18 are drawn to scales larger than that of the remaining figures.

Referring to the figures, A is a car mounted on wheels and adapted to move upon a railway provided with means for self-propulsion and suitably constructed for carrying and holding the operative parts of the device. The car is formed with a base consisting of longitudinal sills B B and cross-timbers C D, Fig. 3, at or near either end and a middle cross-timber E. Upon the timbers D, D, and E is mounted a central longitudinal rotatory driving-shaft F, Figs. 1, 2, and 3, in suitable bearings *b b b*. This shaft may be turned by any convenient or well-known means, preferably by electric motors of ordinary construction (not shown) located at G G, respectively, Fig. 3, and connected with gears *a a*, secured to the shaft. At either end of the main shaft F are placed other shafts H I, Figs. 1, 2, and 3, resting, respectively, in bearings *c d* and *e f*, the two inner bearings *c e* being supported by the respective timbers C C and the outer bearings *d f* being supported by simple parts projecting from the ends of the car-body, as shown in the Letters Patent above mentioned.

Each end shaft H I is provided with a bucket-wheel K, Figs. 1 and 12, outside of and adjacent to the respective ends of the car-body. These wheels are similar to those shown and described in said Letters Patent, each being inclosed in a case or housing L. On the extreme overhanging ends of the shafts H I are held a series of radial blades *g*, Figs. 1, 7, and 14, adapted to cut into the snow as the car advances in either direction and crowd the snow back to the wheel to be thrown out,

as indicated at N in Fig. 7. These blades at either end of the car are shown as four in number, fan-shaped, and placed with their planes inclined to the axis of the shaft carrying them. The blades at either end of the car are held in hubs *h*, Figs. 1, 2, and 13, each of which may be in one or two pieces, as found desirable. The shaft carrying the hub is provided with a longitudinal spline *i* of common kind, the hub being longitudinally grooved to receive the spline. These hubs may be held from moving longitudinally on the respective shafts by any simple means, set-screws *d*², Fig. 13, being commonly employed.

As shown in the figures, the axes of the shafts I, F, and H are in a straight line, couplings *k* being provided to connect them, so that the main driving-shaft F will turn the short end shafts. One half of each coupling is secured rigidly to each of the end shafts, while the other half of each coupling is fitted to slide longitudinally upon an end of the shaft F. These couplings are of common construction, the parts on the driving-shaft F turning with the latter, being controlled by splines in the ordinary manner. Operating-levers *l* and *m*, Figs. 1, 3, and 8, are provided for the parts of the couplings on the shaft F, by means of which either end shaft may be thrown into gear with and driven by the shaft F. The clutch-levers are connected by a tie-rod *n*, Figs. 1 and 10, so that when either clutch is thrown into action the other clutch will be simultaneously thrown out of action, as it is desirable to turn but one end shaft at the same time. The levers are forked across the parts of the clutches, as shown in Fig. 8, and pivoted upon pins *o*, held in short longitudinal timbers *p p*, Figs. 3 and 8, reaching between the cross-timbers C D.

The bucket-wheels K K are covered by housings L L, Figs. 1, 3, and 7. These housings are in part circular, (see Fig. 12,) with a considerable part at the top of each circular part omitted, forming spacious openings *r*, up through which the snow is thrown by the action of the wheels. These openings are sufficiently broad laterally to admit of the snow being thrown out at either side of the housing, according to the direction in which the wheel is turning. A shiftable chute *s*, Figs. 1, 12, and 17, is placed over each opening *r* to control the latter and guide the snow properly out of the wheel-house.

These chutes are preferably metal plates slightly curved, each being held upon a horizontal shaft *t* over the center of the wheel and adapted to occupy either one of two positions, as shown by full and dotted lines in Fig. 12. The chute, which is operated by hand, is turned down against the circular part of the covering for the wheel at one end or the other in accordance with the direction in which it is wished to deliver the snow, the direction of motion of the wheel being arranged accordingly. The upper end of the chute in either of its positions is near or rests

against the roof or deck *u* over the wheel, the other end being held by a simple button or fastener *v*, secured to a part of the wheel-house.

The exit-openings *w w* for the snow at either side of the car are covered by shiftable deflectors *x x*, Figs. 1, 3, 7, and 12, for controlling the snow as it is thrown out by the wheel. These deflectors are each held upon a horizontal shaft *y*, supported at one end by the body of the car and at the other end in bearings *z* on the upper part of the housing L.

The deflectors are operated by means of levers *a' a'*, Fig. 8, within the car, which turn horizontal shafts *b' b'* and crank-arms *c' c'* over the deck *u* of the wheel-house. The crank-arms are connected, respectively, by bars *d'*, Figs. 3, 7, and 12, with short arms *e' e'*, rigid with the respective deflectors. Each lever *a'* is provided with a concentric circular segment *f'*, Fig. 8, which it traverses when turned upon its axis, the levers being provided with set-screws or simple fasteners *g' g'* to hold them rigid with the segments in any position of adjustment. Now by turning the levers the deflectors may be brought to any desired position, as the case may require. When not in use, the deflectors are turned vertically upward, as shown at the upper left-hand corner in Figs. 7 and 12. If it is wished to deposit the snow in a windrow at the side of the track as the car advances, as shown at O, Fig. 7, the deflector *x* is turned well downward to cause the snow to be thus deposited. If it is wished to deposit the snow at a greater distance from the track, the deflector is elevated accordingly, and if in any case it is wished simply to throw the snow out of the wheel-house at random the deflector is turned up vertically out of the way, as above stated. Occasionally, where there are parallel-tracks, it is desirable to deposit the snow along between the two tracks, in which case the deflector is adjusted accordingly.

The levers *a'* with the associated rigid segments and fasteners *g' g'* together form simply a well-known means for holding the deflectors in the necessary positions of adjustment.

The hub *h* for holding the blades is formed with radial thimbles *h'*, preferably four, so placed that the blades will evenly divide a circle, as shown in Fig. 7. These thimbles are preferably threaded on their exteriors, as shown in Fig. 13, each being provided with a screw-cap *i'*. The stems *k'* of the blades are formed to fit the interiors of the thimbles, each stem being provided with a collar *l'* to bear against the outer end of the thimble. The screw-caps are formed so as to press the outer surfaces of the respective collars and when turned down press the collars firmly against the ends of the thimbles, as shown.

The outer ends of the thimbles are each notched, as at *m'*, and the blade-stems are provided with rigid pins *n'*, adapted to enter

said notches. These notches are formed in two diagonal diametrical lines, so as to hold the blades in inclined positions relative with the axis of the hub. This is for the purpose of advancing one or the other edge of each blade to bring the latter into position to cut into the snow as the car advances, according to the direction in which the shaft is made to revolve for depositing the snow either one side or the other of the track. To shift the blades at any time, the screw-caps need to be turned only sufficiently far back to allow the pins to be lifted out of one pair of notches and turned to occupy the other pair in each thimble. The hub as constructed may be put onto the shaft either end first.

The car is provided at each end with a scoop P, usually made of boiler-plate, with upturned sides *o*, Figs. 1, 3, 7, and 9, sufficiently separated to cut a way through the snow wide enough to allow the car to pass easily through. In case the snow is hard or crusted there is at times, particularly on turning curves, a great lateral stress brought to bear upon these upturned parts, tending at times to bend them out of parallel planes. To remedy this difficulty, I employ stiff angle-bars *p'*, made rigid with the frame of the car and reaching horizontally along the outside of each part *o'*, as shown in Figs. 1, 3, and 7. These angle-bars reach to the front vertical edges, respectively, of the parts *o'*, around which they are bent, as shown, to support the parts against stresses calculated to deflect them.

It frequently becomes necessary to raise or lower one end of the car-body, or, perchance, the whole car, for which purpose I employ vertical screws *v'*, Figs. 1, 3, 4, 5, and 10, over the ends of the car-axles *s'*. These lifting-screws extend through the sills and are threaded in extended parts at the upper ends of the jaws R, which hold the axle-boxes. A horizontal plate *t'* is provided between the jaws and near the upper end thereof, between which plate and the box beneath a stiff spring *u'* is employed. The point of the screw in each case bears directly against the plate, so that when the screw is turned downward it will act to lift the sill. The two screws at either end of the car are preferably connected by means of a cross-shaft *v'*, each screw and the shaft being provided with miter-gears *w'*. The screws are extended upward so the shafts *v'* will be above the main shaft F, the upper ends of the screws being preferably supported in simple bearings *x'*, rigid with some convenient part of the frame of the car. The shafts *v'* are supported in suitable bearings *y'*, the shafts each being rotated by some convenient means, as a ratchet and lever *z'*. The upper ends of the screws *v'* are provided with splines *a'*, Figs. 6 and 6 $\frac{1}{2}$, and the miters on the screws are formed with grooves to receive said splines, so that while the screws must turn with the gears they are also adapted to slide vertically through the gears as they are

turned on their axes. Now on account of this arrangement of the parts either end of the car-body may be raised or lowered by working the ratchet-lever *z'*. These ratchet-levers with their ratchets are old and in common use, the pawls being adapted to act in either direction, so that by swinging the levers the shafts *v'* may be turned in either direction to raise or lower the car, as the case may be.

To aid in preventing the scaring of horses where the snow-plow is used in the streets of cities or along much-traveled highways, I provide a hood S, Figs. 1, 3, 7, and 9, to cover the blades *g* as they pass above the shaft. These hoods are simple inclosures made of wood, iron, or other material, the front sides of which consist of movable or folding doors *b'*. These doors are usually closed, as appears in Figs. 1 and 9, but in case of deep drifts of snow the doors are raised out of the way to allow the blades to better act against the snow. The lower door of the pair may be turned up against the side of the upper door, as appears by dotted lines at the right in Fig. 1, or both may be folded on top of the hood, as appears in said figure, suitable hinges of common kind being employed for the purpose.

Frequently, as when making repairs or taking out and putting in parts, it is convenient or desirable to have both clutches *k* out of engagement at the same time, as appears in Fig. 3. To provide for this, I connect the tie-rod *n* with the clutch-levers in such a manner that one end may be readily released from the lever, so that both levers may be operated independently of each other to throw the clutches out of action. In the simple construction shown in Fig. 18 the bent end of the rod passes some distance through the lever and is provided with a removable pin *c'* at the side of the lever. By removing the pin the end of the rod may be quickly slipped out of the lever, allowing the latter to act independently of the other lever, as above stated. The other end of the rod is shown in Fig. 8 as being provided with a nut *e'* to hold it to place on the lever.

This track-cleaner, as it is shown, is designed more particularly to be used upon electric roads, and in its construction four motors are usually employed—viz., two to turn the shaft F and one for each axle *s'* for propelling the car. These motors are not shown, they being of common kind and employed in the usual manner. In using some of these motors it may be necessary, on account of their size, to raise the shaft F above the level of the end shafts H I. In such case the shafts would be connected by some other simple and practical means than the clutches *k k* shown.

What I claim as my invention is—

1. A track-cleaner comprising a car adapted to move upon a railway, having a central, rotatory driving-shaft, and other shafts at either end of the driving-shaft, and couplings

for connecting the driving-shaft with said end shafts, and means as a tie-rod, *n* for throwing the coupling at either end of the driving-shaft into engagement with the adjacent end shaft and simultaneously disconnecting the coupling at the other end of the driving-shaft, substantially as and for the purpose specified.

2. A snow-plow consisting of a car having a longitudinal, rotatory shaft projecting at the end of the car and provided with a wheel and a series of blades for moving the snow, a housing for said wheel, with delivery-openings for the snow at either side of the housing, and a shiftable chute within the housing, over the wheel, for guiding the moving snow out at said openings, in combination with deflectors for the snow, outside of the housing, substantially as and for the purpose specified.

3. A snow-plow consisting of a car having a longitudinal, rotatory shaft projecting at the end of the car and provided with a wheel without the car, and a hub on the shaft having a series of radial thimbles or holders projecting therefrom the outer face of each of which is provided with a series of diametrically oppositely-arranged notches, a series of blades each provided with diametrically oppositely-arranged stops to engage with either set of said notches adapted to rest in a thimble or bearing of said hub, and a cap over the

end of each thimble, substantially as shown and described.

4. A snow-plow comprising a car having its axles journaled in extended jaws, a central, rotatory, longitudinal driving-shaft, and other shafts at either end of the driving-shaft adapted to be turned by said central shaft, the end shafts projecting from the respective ends of the body of the car and each provided with devices for moving the snow, a screw through the car-sill for raising or lowering the car and a plate and a spring between the lower end of the screw and the axle-bearing, substantially as and for the purpose set forth.

5. A snow-plow consisting of a car adapted to move along a railway, having a longitudinal, rotatory shaft projecting at the end of the car and provided with devices for moving the snow, a scoop carried by the car to coact with said snow-moving devices, formed with upturned sides adapted to cut the snow, and stiffeners for said sides carried by the car-body, substantially as specified.

In witness whereof I have hereunto set my hand this 20th day of October, 1896, in the presence of two subscribing witnesses.

GEORGE W. RUGGLES.

Witnesses:

ENOS B. WHITMORE,
M. L. WINSTON.