

No. 720,208.

F. V. WINTERS.

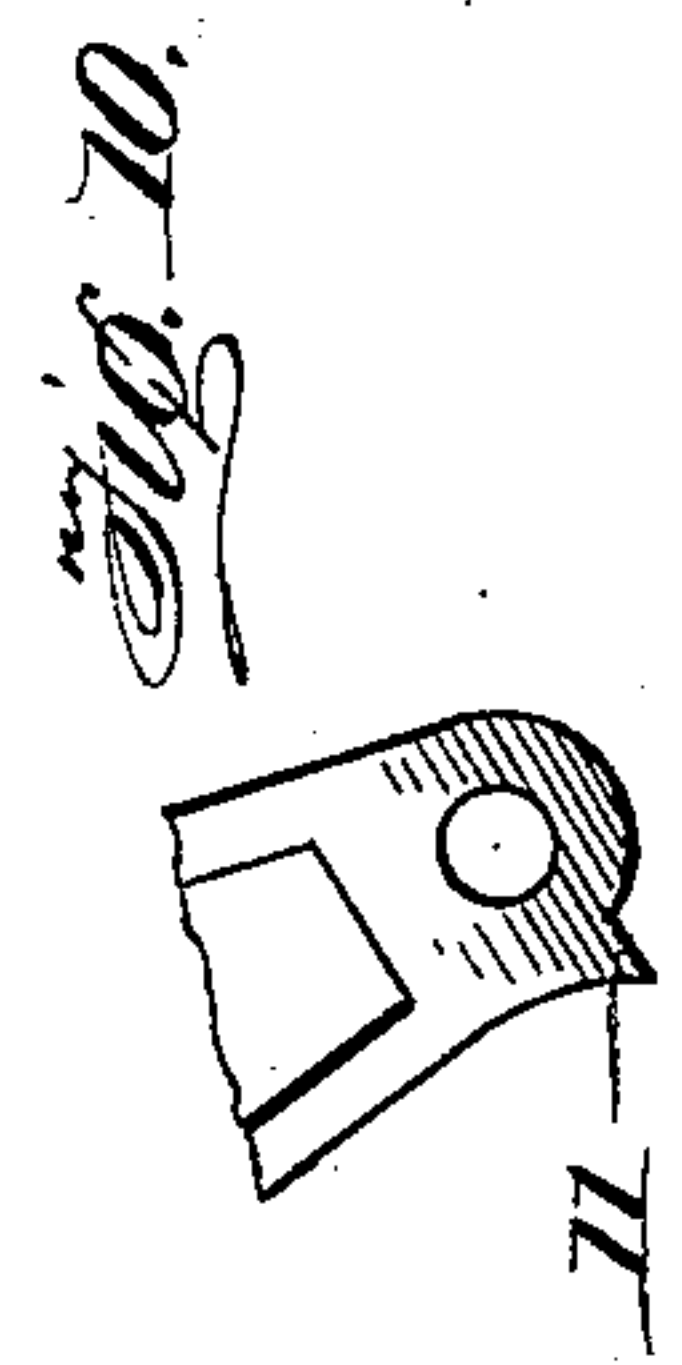
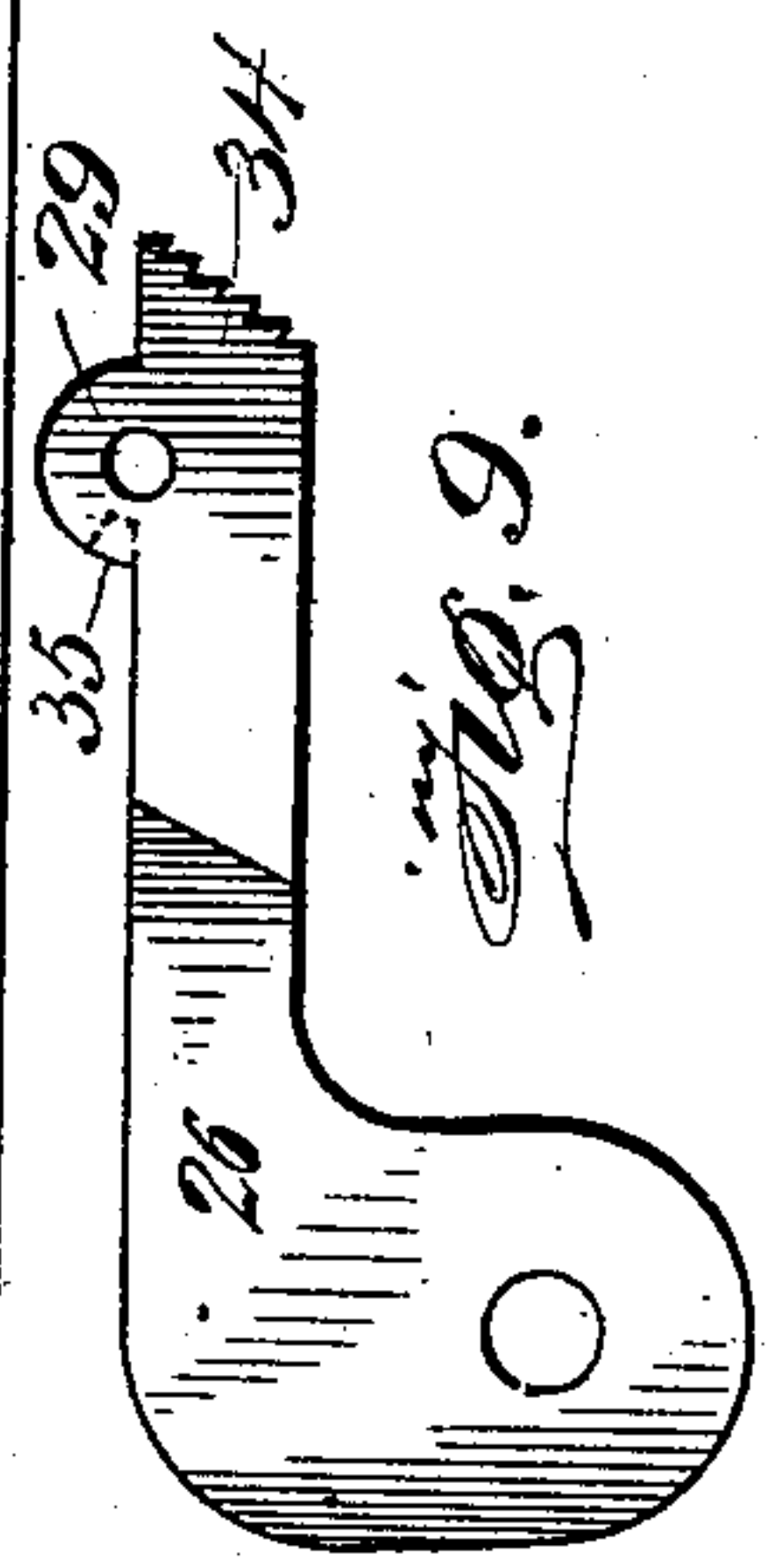
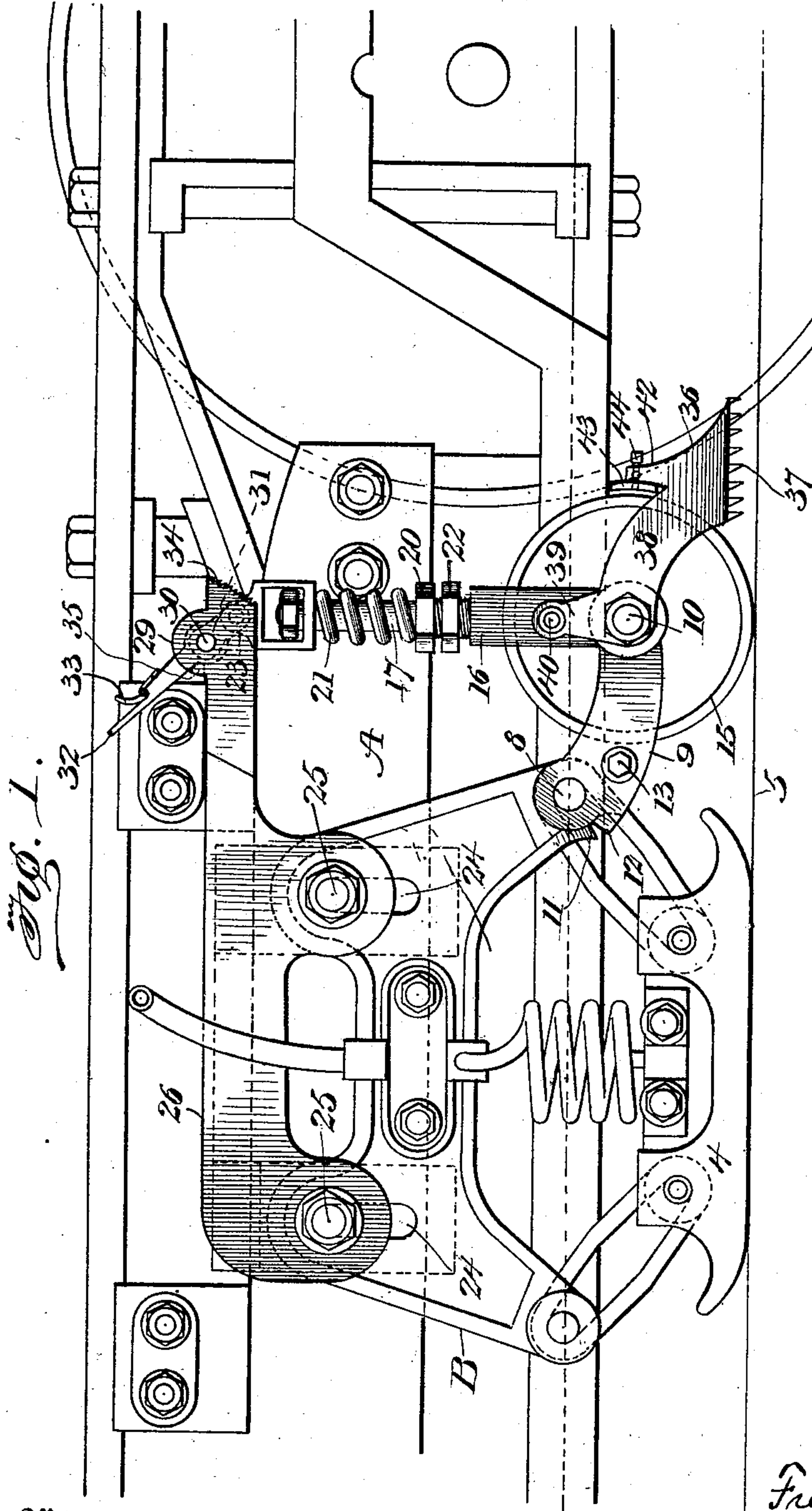
PATENTED FEB. 10, 1903.

MECHANISM FOR REMOVING ICE AND SNOW FROM THE CONDUCTING OR
THIRD RAIL OF ELECTRIC RAILWAYS.

APPLICATION FILED AUG. 5, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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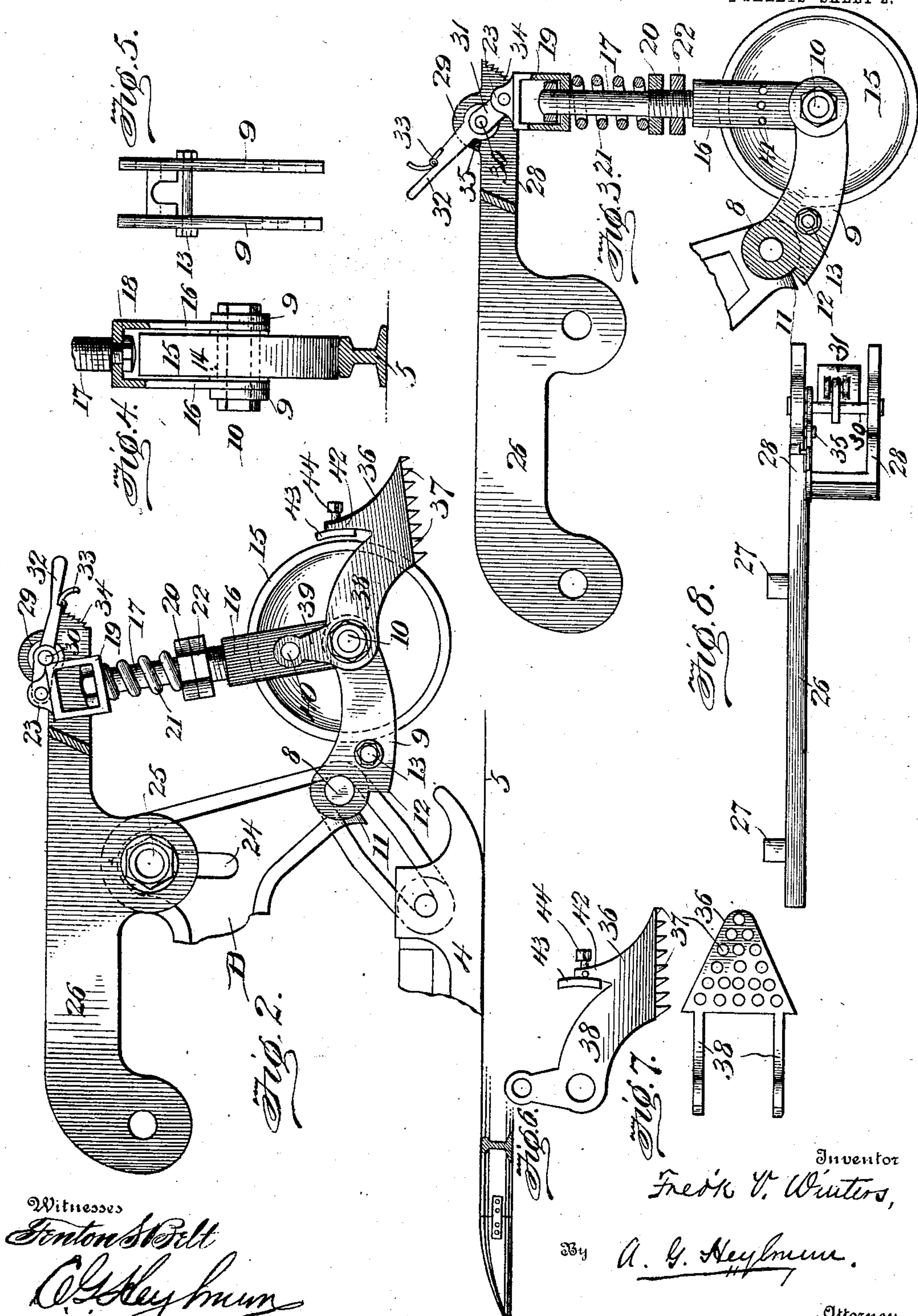
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TO JOHN SCOTT McWHIRTER, OF NEW YORK, N. Y.

MECHANISM FOR REMOVING ICE AND SNOW FROM THE CONDUCTING OR THIRD RAIL OF ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 720,208, dated February 10, 1903.

Application filed August 5, 1902. Serial No. 118,436. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK V. WINTERS, a citizen of the United States of America, residing in the city of New York, in the State of New York, have invented a new and useful Device or Apparatus for Removing Ice and Snow from the Conducting or Third Rail of Electric Railways, of which the following is a specification.

10 The invention embodies and comprises a crushing mechanism pivotally and resiliently supported, means for applying pressure to and lifting the crushing mechanism, and a preliminary cleaner supported by and associated with the crushing mechanism, all arranged, assembled, and aggrouped as will be hereinafter specified, and the novelty thereof particularly pointed out and distinctly claimed.

20 I accomplish the intendments of my invention by the means and mechanism illustrated in the attached drawings, forming a part of this specification, and wherein—

25 Figure 1 is a side elevation of a portion of a car-truck of well-known construction equipped with my improved track-cleaning mechanism, showing it in operative relation to the conductor or third rail. Fig. 2 is a side elevation of the cleaning mechanism, showing it as raised and held from contact with the rail or conductor. Fig. 3 is a side elevation, partly in section, of the device. Fig. 4 is a detail edge elevation of the ice-crushing wheel and the supporting-yoke, the plow being removed. Fig. 5 is a detail view of the pivotally-supported arms or hangers for the crushing-wheel. Fig. 6 is a detail view of the plow or scraper. Fig. 7 is a bottom plan view of the plow or scraper, showing the arrangement of the prongs or teeth. Fig. 8 is a top plan view of the supporting-beam. Fig. 9 is a modified form of a supporting-beam. Fig. 10 is a detail view of the bearing piece or extension formed on the end of the arm of the car-bracket.

45 It will be prefaced that while I have shown my invention as connected to and associated with a truck and contact-shoe bracket in general use it is apparent that the character or build of the carrying-truck and the car-bracket may be changed without departing

from the objects and purposes of the invention, and in instances where rotary trolleys are used in connection with a rigid or fixed third rail the invention may with equal facility be utilized.

In the drawings I have shown the car-truck as carrying a strong and rigid timber A, secured in proper position by any proper fastenings and to which is firmly secured a strong bracket B. The bracket B is formed with vertical slots 24, so that it may be adjusted to the required height and position and there secured by clamping-bolts 25. At each end of the bracket B is formed an outwardly and downwardly extending arm, which carries a link extending inward and downwardly, and to the inner ends of the links the contact-shoe 4 is secured, so as to ride on and contact with the conductor-bar or third rail 5. 5^a indicates one of the standard rails of the road. All these elements and features are arranged in a well-known manner and form no part of the present invention, except that I utilize the slots and clamping-bolts of the bracket B as means for holding and fastening the supporting-beam in position, as will be specified, and I also form the free end of one of the depending arms of the bracket B with a bearing ear, lug, or extension 6, to be utilized as the connecting element for the pivoted arms which carry the ice-crushing wheel and plow or scraper.

Referring to the drawings, it will be seen that the bearing 6, formed on the end of the arm of the bracket B, is provided with an aperture 7, constituting a seat for a pivot or bearing bolt 8, which is pivotally arranged therein with its ends projected therefrom in both directions, and on the projecting parts are pivotally mounted arms 9, which extend forward the desired distance and carry in their outer ends a bearing-pin 10. The bearing 6 is formed with a stop lip or lug 11, and the bearing-ears of the arms 9 have coincident shoulders 12, which contact with the stops 11 and prevent the arms from dropping or swinging downward beyond the point of contact of the stops and shoulders, but leaving them free to be swung upward when desired.

It will be perceived from the foregoing de-

scription and reference to the drawings that the mechanism carried by the arms 9 cannot descend below the point of contact of the shoulders 11 and 12, so that the crushing-wheel while in service will be carried at all times substantially on the same horizontal plane or line and remain in contact with the general tread-line of the third rail. Hence the object of this contacting-shoulder construction is that when the car passes over any depressions in the third rail, such as occur at switches and crossovers at crossings, the cleaner will not chuck into the depressions, but will be carried over them without detriment to the mechanism or jar to the car. The arms 9 are held on their bearing and in relative alinement with each other by a cross-bolt 13, projected through them adjacent to their pivotal support on the bracket B.

On the bearing 10 is mounted an axle-sleeve 14, on which is journaled an ice-crushing wheel 15, which runs between the arms of a yoke 16, mounted on the bearing-pin 10. The perimeter of the crushing-wheel 15 is preferably made substantially flat to conform to the tread-surface of the conductor or third rail; but it may be provided on its circumferential face with milled serrations running across the face or annularly around the wheel, and generally the face of the wheel will conform to the contour of the face of the conductor.

Through the bridge of the yoke 16 is let the lower end of a standard or stem 17, secured in position by a nut 18. The upper end of the standard 17 is slidably projected through the bottom of a cage or housing 19 and adjustably held by a fastening-nut threaded thereon. On the standard between the bottom of the housing and an adjusting-nut 20 is arranged a spiral spring 21. A locking-nut 22 locks the nut 20 in any position to which it may be set. It will readily be perceived that by adjusting the nut 20 the tension of the spring is correspondingly increased or decreased and the pressure of the crushing-wheel on the third rail in like manner effected.

It may be stated that a reversal of the tension means may serve the purpose intended—that is, the stem or standard may be arranged to give or yield in the bridge of the yoke and be set or rigid at the upper end.

On the housing 19 are formed lugs 23, to which the end of a lever-arm is connected, whereby the standard, with the connected mechanism, may be raised and lowered.

As heretofore stated, the bracket B is formed with vertical slots 24, through which the clamping-bolts 25 are passed, and these are utilized for holding a supporting beam or rail 26 in place. This supporting-beam 26 consists of a strong metal body formed with laterally-extending lugs 27, adapted to engage in the slots 24, and the beam is also provided with apertures registering with said slots, through which the clamping-bolts pass to clamp the beam in position. The beam 26 pro-

jects forward beyond the end of the bracket B and is provided or formed with a bracket on its projecting end portion. This bracket consists of parallel side plates 28, united at their bases to the beam and adapted to permit the housing 19 to move freely between them and be guided in such movements by them. The plates 28 are formed with circular extensions 29 on their upper edges, wherein is mounted a suitable rock-shaft 30, formed or provided with a rigid radial arm 31, the end of which engages between the lugs on the housing and is connected thereto by a pivot-pin passed through the lugs and the end of the arm. On the rock-shaft 30, at one end thereof, is mounted a lever 32, provided with a suitable spring-actuated pawl 33, arranged to engage the teeth of a rack 34 on the end of the side plate, as shown in the drawings. Under the ordinary position in service the cleaning mechanism stands, as seen in Figs. 1 and 3, with the lever extending back and lodged against a lug or bar 35, where it serves as a stay to the housing and maintains it in the desired vertical position in relation to the standard 17. When it is desired to lift the mechanism out of service, the lever 32 is swung over into the position indicated in Fig. 2 of the drawings, with the pawl engaged in the teeth of the rack and the mechanism carried free from the third rail.

Associated with and auxiliary to the crushing-wheel 15 is a plow and scraper 36, consisting of any suitable plow-shaped body formed with a flat under surface, as shown in the drawings, and on the bottom is provided with a plurality of pointed teeth 37, gradually decreasing in length from the heel to the point of the plow, the object being that when an extra accumulation of ice occurs on the rail the teeth will tear and break it to pieces and fit it to be entirely crushed and obliterated as an impediment to conductivity by the crushing-wheel. The plow 36 is formed with rearwardly-extending arms 38, straddling the crushing-wheel and pivotally supported on the bearing-pin 10, and in order that the plow may be adjusted in position relative to the third rail or conductor the rearward-extending arms are provided with vertical extensions 39, having apertures in their upper ends through which set screws or pins 40 are projected into holes 41 in the arms of the yoke 16. It will be perceived that by moving the set-screws 40 to different holes the relation of the plow to the conductor or rail will be adjusted as desired or required. The plow 36 is formed with a vertical extension 42, to the inner side or face of which is posited a friction shoe or rubber 43, of any suitable material, bearing with its working face against the perimeter of the crushing-wheel and serving by its frictional contact with the wheel to excite heat sufficient to prevent the adherence of ice or snow on the wheel and to clean the face of the wheel at all times while in service. The shoe 43 is carried adjustably by an ad-

justing-screw 44, let through the vertical extension 42 of the plow.

In Fig. 9 of the drawings I have shown the supporting-beam 26 as having but a single connection to the supporting-bracket, and this construction will be found efficient in light duties.

It is well known that much trouble is experienced in the winter season by snow accumulating and ice forming on the surface of the third-rail conductor, preventing direct contact of the shoe with the conducting-rail to the detriment of complete conductivity, and this difficulty it is the object of my invention to obviate by keeping the rail clean and free from non-conducting material and accumulations. This I accomplish by the improved mechanism herein described and illustrated. The mechanism may be readily moved into and out of service by the operation of the lever, as heretofore described.

It will be readily seen that a sufficient force or pressure is exerted on the third rail or conductor by the crushing-wheel to crush and granulate or disintegrate the accumulations on the surface of the conductor. The requisite force to accomplish this result is attained by the tension to which the spring on the vertical stem or standard may be adjusted.

It may be stated that, except in very severe freezing weather, it may not be necessary to equip every car of the line with the cleaner, because there will hardly be time enough after the car with the cleaner attached passes until the next car passes for the ice to form, and the rail will be clean and in complete conducting condition by the prior action of the cleaner on the preceding car carrying it.

Having described my invention, what I claim is—

1. A snow and ice cleaner for third rails, comprising horizontally-arranged and pivotally-supported arms, a crushing-wheel journaled in the free ends of the horizontal arms, and a spring pressing device to hold the crushing-wheel down on the third rail.

2. A snow and ice cleaning device for third rails, comprising pivotally-supported arms formed with shoulders on their bearing ends to limit their downward movement, a crushing-wheel journaled in the free ends of the arms, and a spring pressing device to hold the crushing-wheel down on the third rail.

3. A snow and ice cleaning device for third rails, comprising pivotally-supported arms formed with shoulders on their bearings to limit their downward movement, a crushing-wheel journaled in the free ends of the arms, a yoke straddling the wheel and having the bearing-pin thereof passed through the ends of the arms of the yoke, a vertical standard projecting from the bridge of the yoke, a tension-spring on the standard, and a lever to lift the standard with the wheel from contact with the third rail.

4. A snow and ice cleaner for third rails, comprising pivotally-supported arms formed

with shoulders at their pivotal point to limit their downward movement, a crushing-wheel journaled in the free ends of the arms, a yoke straddling the wheel and having the journal of the wheel passed through the arms thereof, a vertical standard secured to the bridge of the yoke, a housing having a limited movement on the upper end of the standard, and a lever to lift and hold the housing and mechanism elevated from the third rail.

5. The combination with a supporting-bracket formed with a shouldered bearing-piece, of arms pivotally connected to said bearing-piece and formed with shoulders at their pivotal connection to contact with the shoulders on the bearing-piece of the bracket, a crushing-wheel journaled in the free ends of the arms, a yoke straddling the crushing-wheel and having the journal thereof passed through the arms of the yoke, a supporting-beam overhanging the crushing-wheel and formed with a bifurcated bracket at its free end, a rock-shaft mounted between the plates of the bifurcated bracket formed with a radial arm, a lever to rock the shaft, a housing pivotally connected to the outer end of the radial arm, a vertical standard having a limited vertical movement in the housing and having its upper end secured to the housing and having its lower end secured in the bridge of the yoke, a tension-spring on the standard, and means on the standard to regulate the tension of the spring.

6. The combination with the crushing-wheel and the yoke straddling the wheel, of a plow arranged in advance of the crushing-wheel and formed with rearwardly-extending arms pivotally supported on the journal of the wheel and having vertical arms straddling the arms of the yoke, and means to adjustably set the vertical arms in adjusted position.

7. The combination of the pivotally-supported arms, the crushing-wheel journaled in the free ends of the arms, the yoke carried by the journal of the wheel, means to raise and lower the yoke, the plow pivotally supported on the journal of the wheel and formed with vertical arms lying against the arms of the yoke and having a vertical extension at the rear of the plow, a friction-shoe secured to said extension to bear against the wheel, and means to hold the vertical extensions of the plow in adjusted position.

8. The combination of the pivotally-supported arms, the crushing-wheel journaled in the free ends of the arms, a plow pivotally supported on the journal of the wheel and formed with a serrated under surface gradually inclined upward from the heel to the point of the plow.

9. The combination of the crushing-wheel, a yoke supported on the journal of the wheel, a standard projecting vertically from the yoke, a beam overhanging the standard and formed with a rack on its free end, a lever to lift the standard, and a pawl on the lever to engage the rack on the beam to hold the yoke

with the connected mechanism in elevated position.

10. The combination of the pivotally-supported crushing-wheel, and the plow arranged
5 in advance of said wheel and pivotally mounted on the axle thereof.

11. The combination of the pivotally-supported arms, a bearing in the free ends of the arms, a crushing-wheel journaled on the bearing,
10 ing, and a plow pivotally supported on the bearing and formed with teeth on its under face decreasing in length from the heel to the point of the plow.

12. The combination of the pivotally-supported arms, a bearing in the free ends of the arms, a crushing-wheel journaled on the bearings, a plow pivotally supported on the bearing and arranged to travel in advance of the wheel and a friction-shoe carried by the plow
20 in contact with the wheel.

13. In a mechanism of the character described, the combination of a supporting-bracket formed with a bearing-ear having a limiting-shoulder, arms pivotally connected
25 to said bearing-ear and formed with bearing-ears having shoulders to contact with the shoulder on the bearing-ear of the bracket, and a crushing-wheel journaled between the free ends of the arms.

30 14. In a mechanism for cleaning the ice

from the third rail of an electric railway, a pivotal support mounted to swing vertically on its pivot, a bearing in the free end of the support, a wheel journaled on the bearing, a plow pivotally connected to the bearing and
35 posited to travel in advance of the wheel, a friction-shoe carried by the plow in contact with the wheel, means to adjust the plow in relation to the surface, and means substantially as described for raising and lowering
40 the mechanism.

15. The combination in a device of the character described, of a bracket-arm having a bearing-piece formed thereon, a beam secured to the upper portion of the bracket, arms pivotally secured to the bearing-piece, a plow
45 formed with rearwardly-extending arms, a crushing-wheel, a vertically-movable yoke straddling the wheel, and connected to the beam, and a bearing-pin projected through
50 the arms, the wheel, the yoke and the plow-arms and holding the united parts pivotally together.

In testimony whereof I have hereunto signed my name to this specification in the
55 presence of two subscribing witnesses.

FREDERICK V. WINTERS.

Witnesses:

WM. H. HUEGLE,

WM. H. SWIFT.