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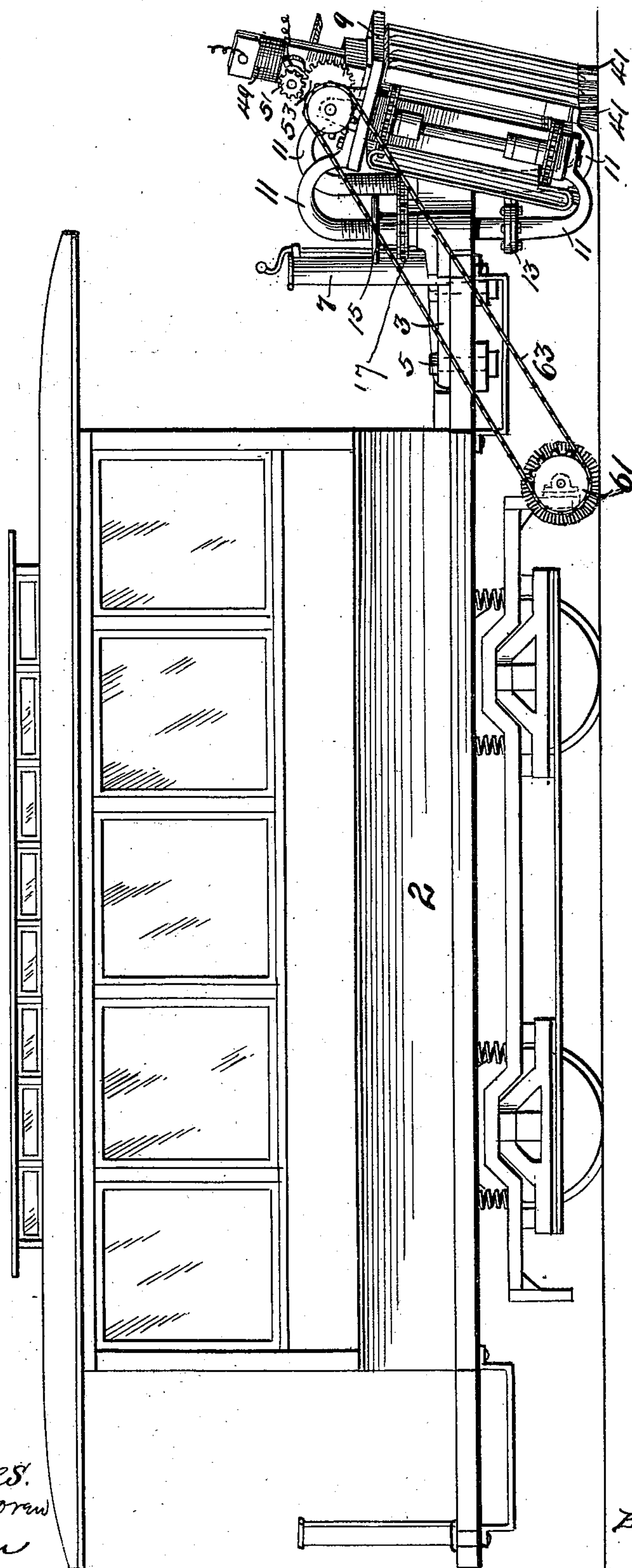
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H. H. KRYGER.
ELECTRIC SNOW PLOW.

No. 556,315.

Patented Mar. 10, 1896.

Fig. 1.



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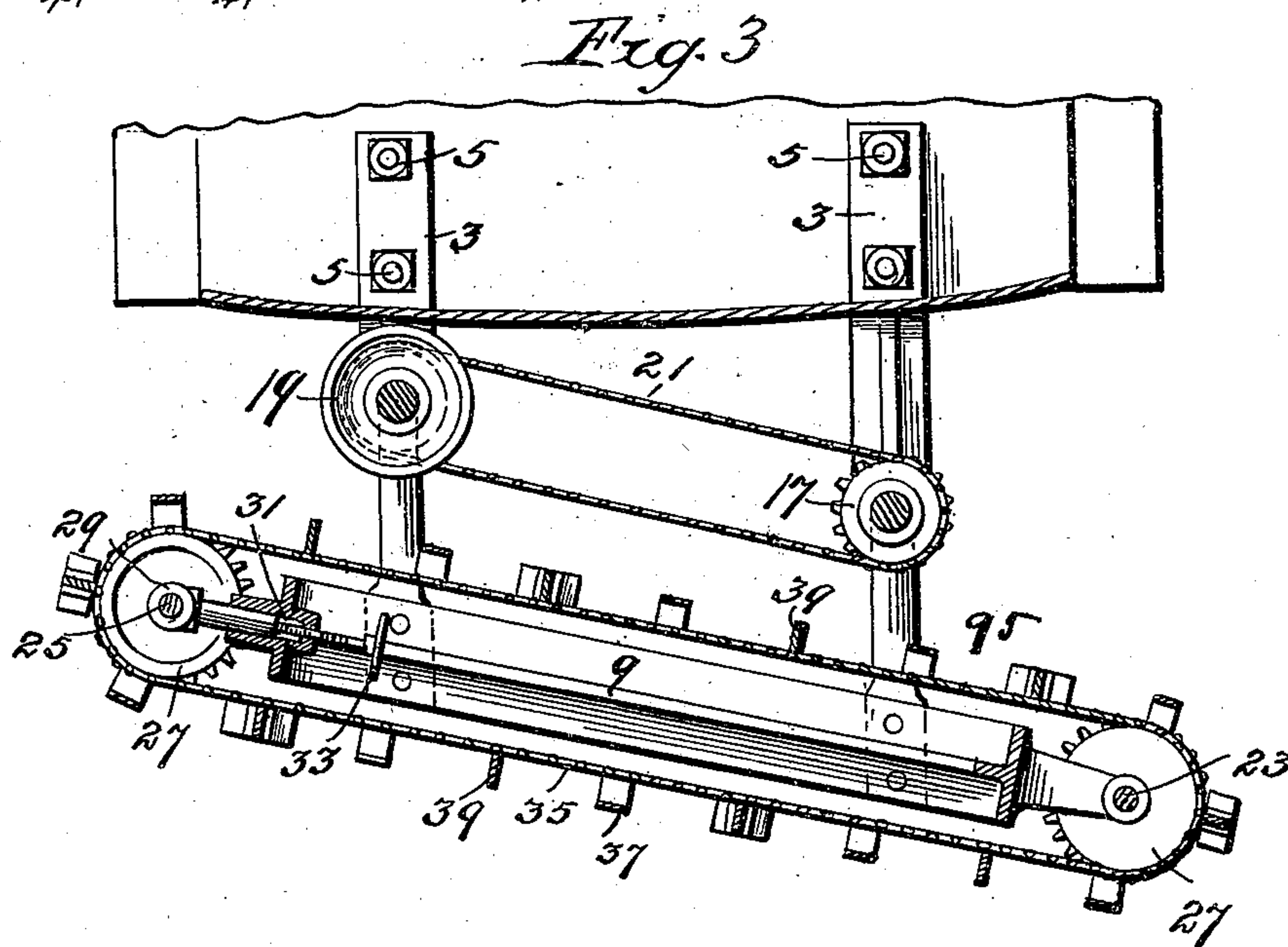
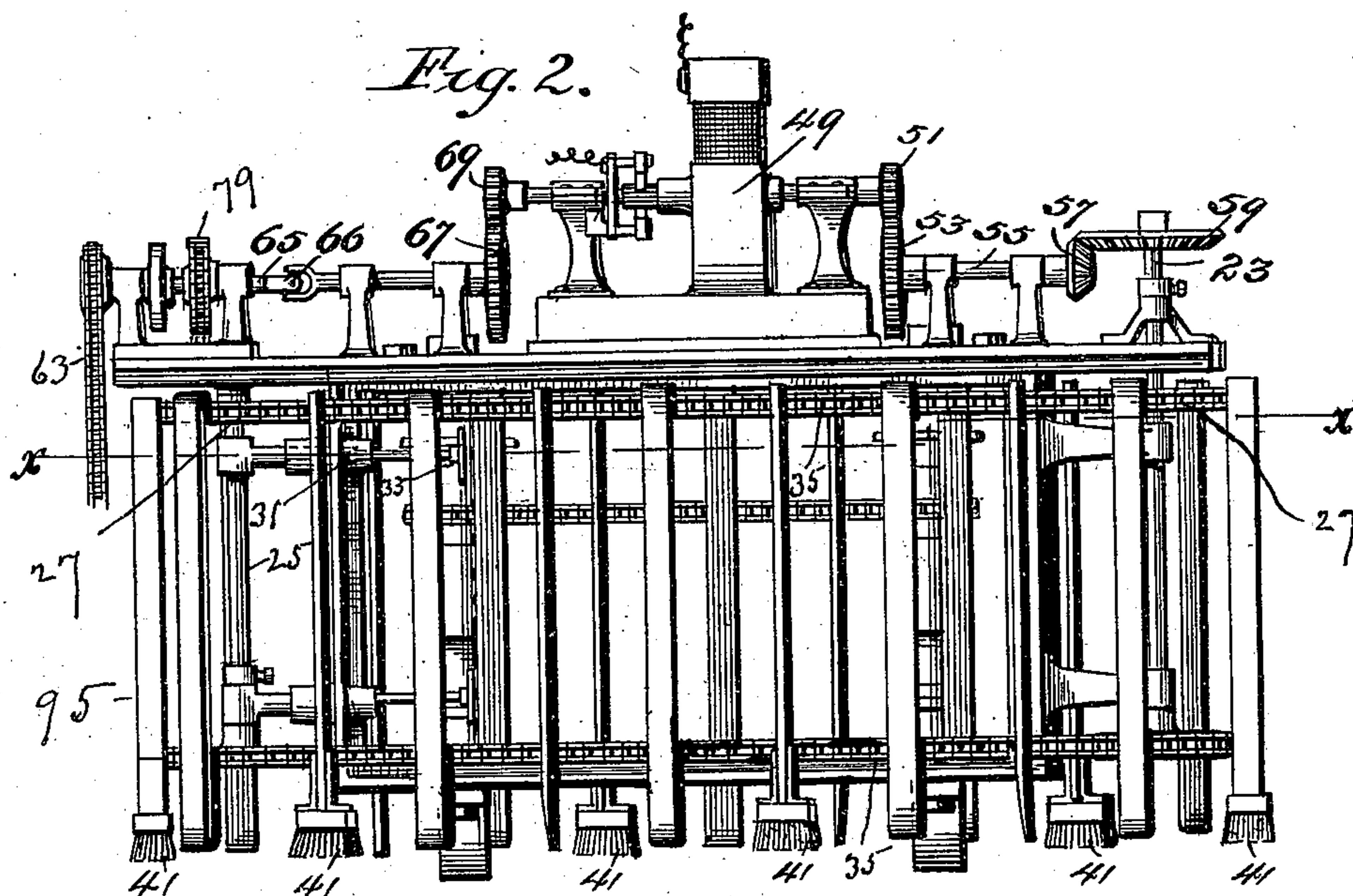
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Fig. 4.

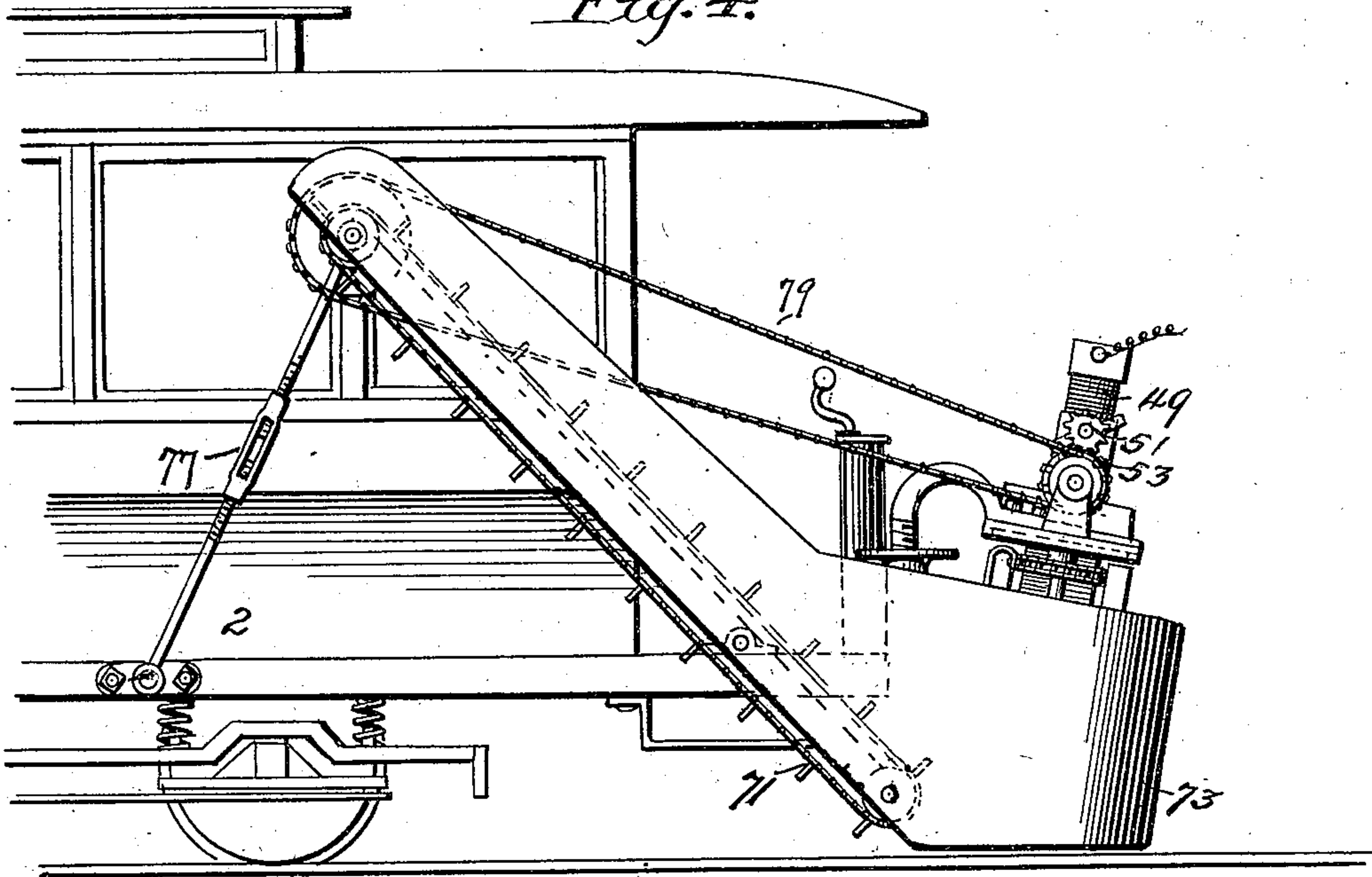


Fig. 5.

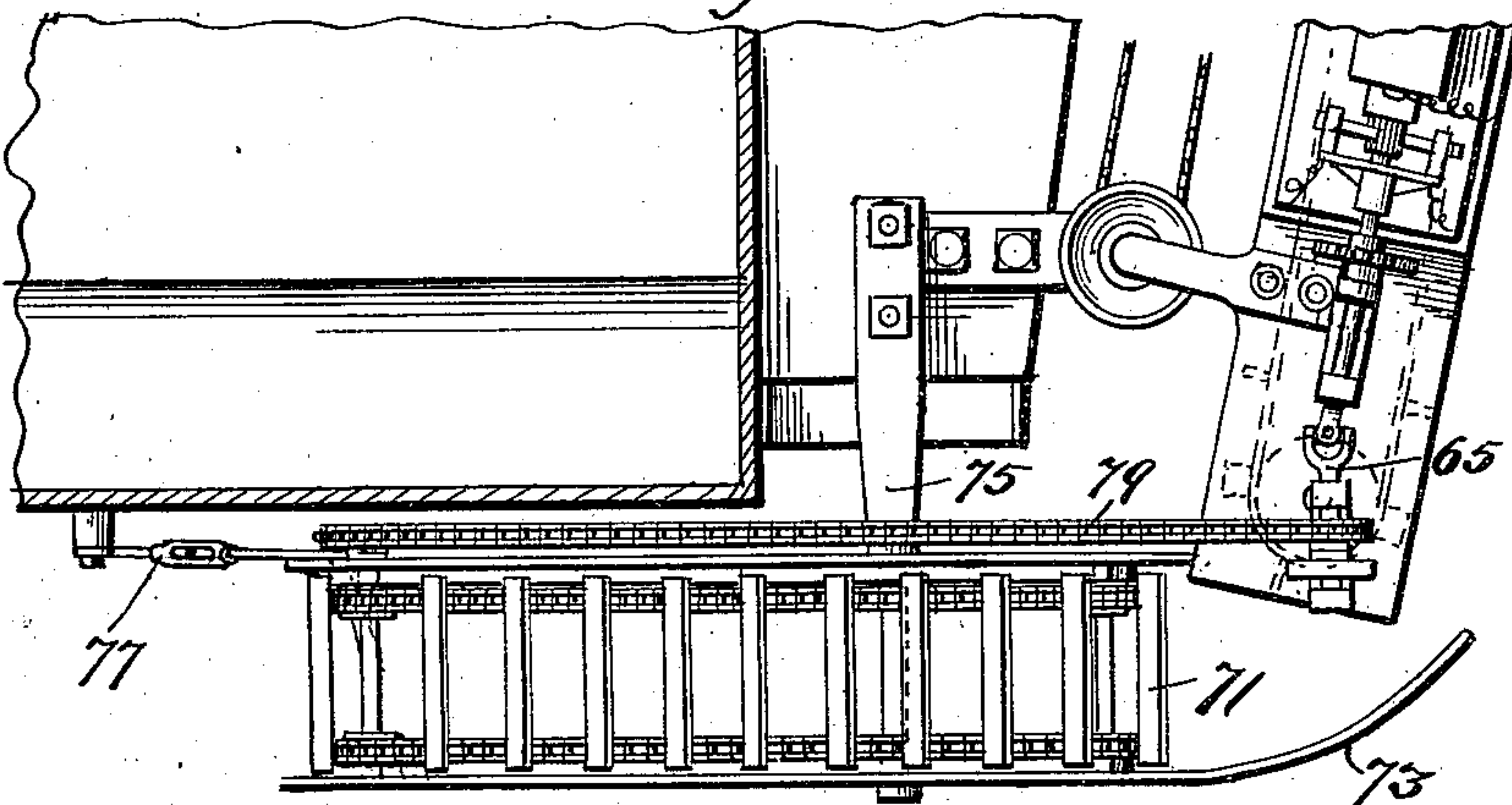


Fig. 6.

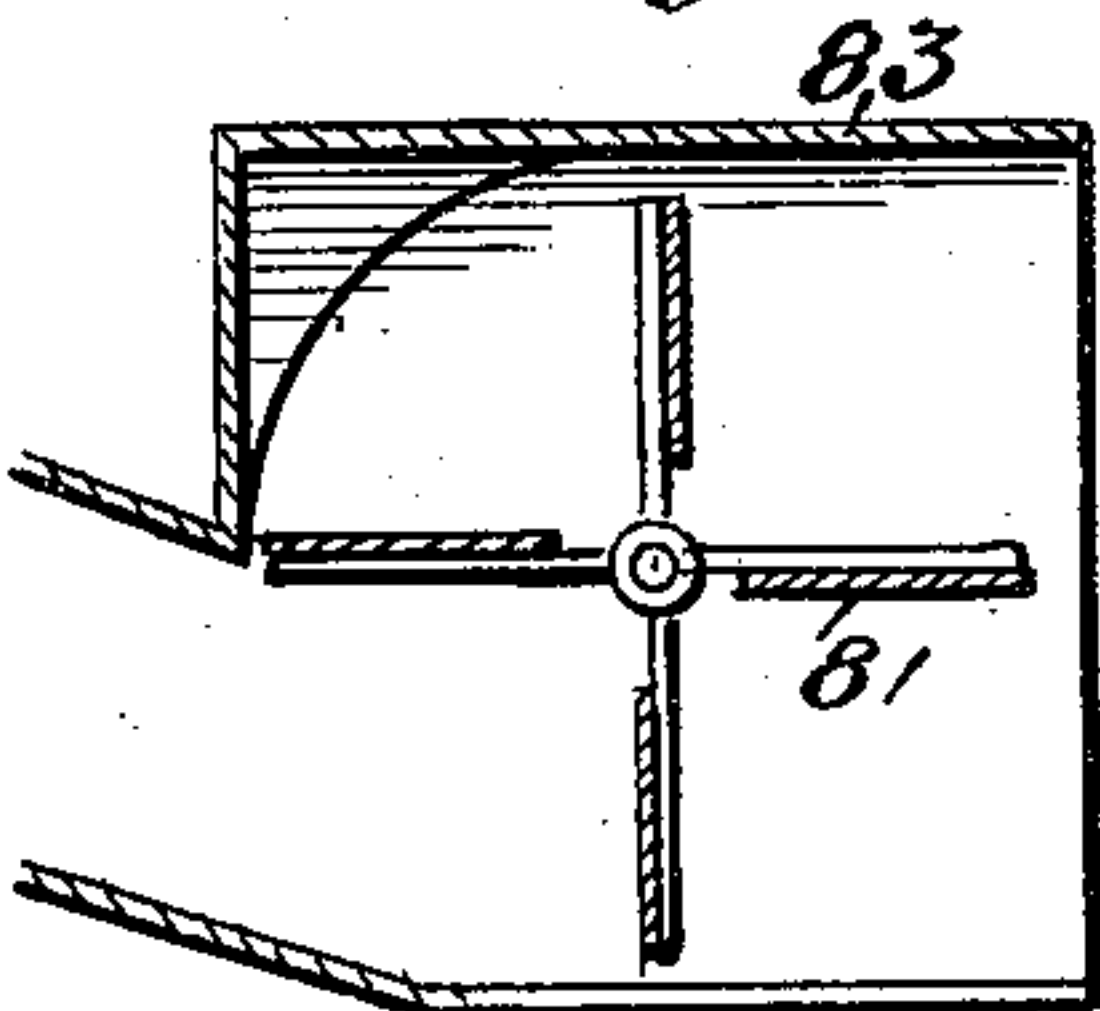
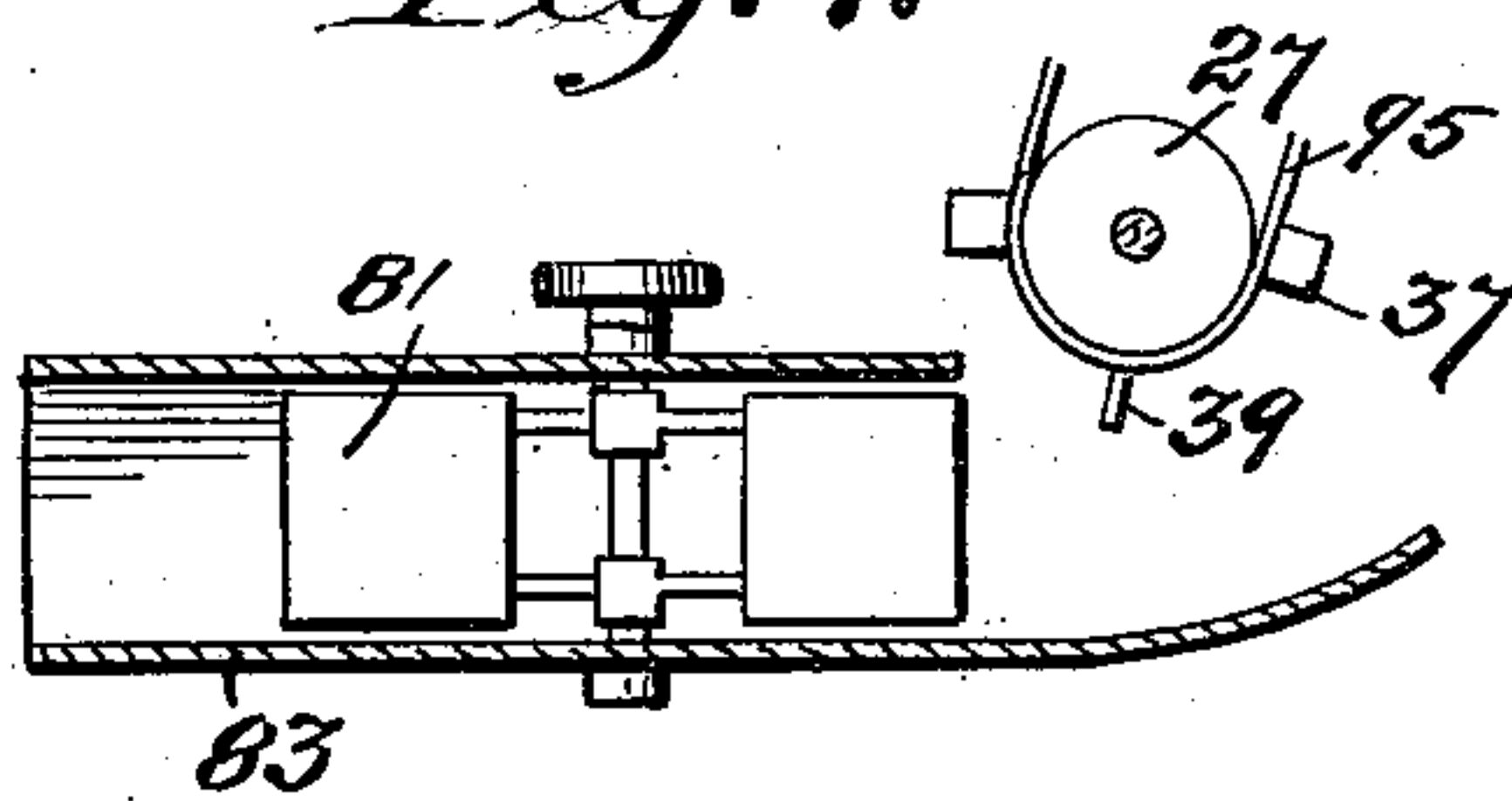


Fig. 7.



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UNITED STATES PATENT OFFICE.

HENRY H. KRYGER, OF MINNEAPOLIS, MINNESOTA.

ELECTRIC SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 556,315, dated March 10, 1896.

Application filed September 10, 1891. Serial No. 405,247. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. KRYGER, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented a certain new and Improved Electric Snow-Plow, of which the following is a specification.

This invention relates to improvements in means for clearing railway-tracks from snow, and the device is especially designed for application to an electric car such as is used for street-railways.

The invention consists generally in the construction and combination hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of a street-railway car having my invention applied thereto. Fig. 2 is a front elevation of my improved snow-plow. Fig. 3 is a plan section on the line $x x$ of Fig. 2. Fig. 4 is a side elevation of a portion of the car, showing the device applied thereto and showing also an elevator for raising the snow and depositing it in a cart or other receptacle. Fig. 5 is a plan view of a portion of the mechanism shown in Fig. 4. Figs. 6 and 7 are details of a fan device that may be arranged at the side of the car for the purpose of moving the snow away from the side of the snow-plow.

In the drawings, 2 represents an ordinary street-car of the kind ordinarily used for electric railways.

My improved plow is provided as an attachment that may be applied readily to any car, and may be removed therefrom when there is no occasion for its use.

In applying my device to a car I preferably provide suitable brackets 3 that are secured to the platform of the car and project in front thereof. The brackets 3 are preferably secured to the platform by means of suitable bolts 5, and these brackets preferably extend through openings in the fender or dash-board 7 and project a suitable distance in front of the car. The snow-plow is supported upon an upright frame 9, and this frame is supported upon a bracket 3, so as to be capable of adjustment thereon.

For securing the frame 9 upon the bracket 3 I provide standards 11, which are preferably secured to the top and bottom of the

frame 9, each standard being formed in two parts secured together by the coupling 13 and passing through the bracket 3. Each bracket is provided with a vertical socket which receives a sleeve 15 that is internally threaded and is fitted upon a threaded portion of the standard 11. The sleeve 15 is fitted into the bracket 3 and extends to the bottom of said bracket. Each of the sleeves 15 may be provided with a sprocket-wheel 17, and one of the sleeves 15 may be provided with a hand-wheel 19. A chain 21 is used to connect the said sprocket-wheels, and by turning this hand-wheel the said sleeves are turned on the standards 11, thereby raising or lowering said standards and with them the frame 9 and the mechanism carried thereby.

The frame 9 is preferably arranged in an inclined position, as shown in Fig. 1, so that the forward edge of the frame and of the carrier supported by it is brought nearer to the track than the rear edge, as shown in Fig. 1, and one end of the frame 9 is farther forward than the other, as shown in Fig. 3, thus bringing the frame and the mechanism carried by it in an inclined position with respect to the edge of the car, and it may be arranged at any desired angle. The frame 9 is provided at its end with bearings for the shafts 23 and 25, said shafts being provided at their upper and lower ends with the sprocket-wheels 27. The shaft 25 is preferably supported in bearings 29, that are adjustable upon the frame 9, being secured in sockets 31 in said frame, and the frame being provided with the adjusting-screws and hand-wheels 33, by which said shaft may be adjusted. An endless carrier is supported upon the frame 9, and this carrier consists of chains 35, mounted upon the sprocket-wheels 27 and provided with a series of open cutters 37 and a series of carriers 39. The cutters 37 are arranged to cut or loosen up the snow, and the carriers 39 move it across the track to one side thereof. A series of brushes 41 are preferably secured upon the bottoms of the carriers 39, and these brushes sweep over the track and sweep off the loose snow that is not removed by the carriers 39.

For the purpose of operating the endless carrier I preferably provide a suitable electric motor 49, that is mounted upon the frame

9 and is provided with a pinion 51 upon its shaft that engages a gear-wheel 53 upon a shaft 55, that is provided with a bevel-pin-
 5 ion 57, that engages a bevel-head 59 upon the shaft 23, this motor being driven, preferably, by an electric current from the wire or bat-
 10 tery that runs the car. I may also provide a rotating cutter-wheel or flanger 61, that is lo- cated in front of the car-wheel in position to
 15 cut a channel just inside of the rail for the purpose of receiving the flange of the wheel. This flanger may be driven by a chain 63 from
 20 a shaft 65, that is in turn driven through suitable gears 67 and 69 from the motor- shaft. The shaft 65 is preferably made in
 25 two parts and connected by a universal joint 66, thereby bringing the part to which the pinion for driving the chain 63 is applied at
 30 right angles to the side of the car.

35 I may also employ an elevator 71, that is arranged alongside the car and is provided with a hood or shield 73, that extends around the end of the transverse carrier or plow 95. This elevator is supported by a bracket 75
 40 and an adjustable rod 77 and is driven by a chain 79 from the shaft 65. By this means the snow that is cleared from the track by
 45 the transverse carrier is received upon this elevator and is carried up to the top thereof, from which point it may be allowed to fall
 50 into a suitable receptacle arranged beneath the upper end of the elevator.

55 Instead of using the elevator I may employ a fan 81, arranged in a suitable casing 83 and adapted to receive the snow from the trans-
 60 verse carrier, as shown in Figs. 6 and 7, and clear it away from the end of the transverse carrier.

I claim as my invention—

65 1. The combination with a suitable car, of a frame supported upon the end of said car, a transverse endless carrier mounted upon
 70 said frame and provided with a series of open cutters 37 and with a series of carrying-plates 39 and an electric motor connected with said
 75 carrier and adapted to drive the same.

80 2. The combination with a suitable car, of the frame adjustably supported upon the plat-
 85 form of said car, an endless carrier mounted upon said frame and extending transversely
 90 of said car and provided with a series of open cutters 37 and with a series of carrying-plates 39 and an electric motor arranged upon said
 95 car and connected with and adapted to drive
 100 said carrier.

105 3. The combination with a suitable car, of suitable brackets secured upon the platform of

110 said car, adjustable standards mounted in said brackets, a frame secured upon said stand-
 115 ards, an endless carrier arranged upon said frame and extending transversely of said car, and an electric motor connected with said
 120 carrier and adapted to drive the same.

125 4. The combination with a suitable car, of the brackets 3 secured upon the platform of
 130 said car, standards 11 mounted in suitable sleeves 15 in said brackets and adapted to be vertically adjusted by means of said sleeve,
 135 the inclined frame 9 secured upon said stand- ard and the endless carrier arranged upon
 140 said frame and extending transversely of said car, and an electric motor mounted upon said
 145 frame and arranged to drive said carrier.

150 5. The combination with a suitable car, of the brackets secured upon the platform of the
 155 car, a vertically-adjustable standard mount- ed upon said brackets, an inclined frame se-
 160 cured upon said standards, shafts mounted upon said frame provided with suitable
 165 sprocket - wheels, endless chains arranged upon said sprocket-wheels, a series of cutters
 170 and a series of carriers secured upon said chains, and a series of brushes secured upon
 175 said carriers.

180 6. The combination with a suitable car, of a transverse inclined carrier mounted upon a
 185 suitable frame in front of said car and pro- vided with a series of brushes at its lower end,
 190 and an electric motor connected with said carrier and arranged to drive the same, as
 195 described.

200 7. The combination with a suitable car, a frame adjustably mounted thereon, an elec-
 205 tric motor arranged upon said frame, a wheel or cutter arranged to cut a groove or channel
 210 inside of the track-rail to receive the wheel- flanges, and a connection between said cutter
 215 and said electric motor whereby said cutter may be driven from said motor, as described.

220 8. The combination with a suitable car, of a suitable frame adjustably arranged in front
 225 of said car, an endless carrier mounted there- on, an electric motor for driving said carrier,
 230 an elevator arranged at the side of the car and adapted to receive material from said
 235 transverse carrier, and a connection between said electric motor and said elevator.

In testimony whereof I have hereunto set my hand this 7th day of September, 1891.

HENRY H. KRYGER.

In presence of—

F. S. LYON,

C. E. VAN DOREN.