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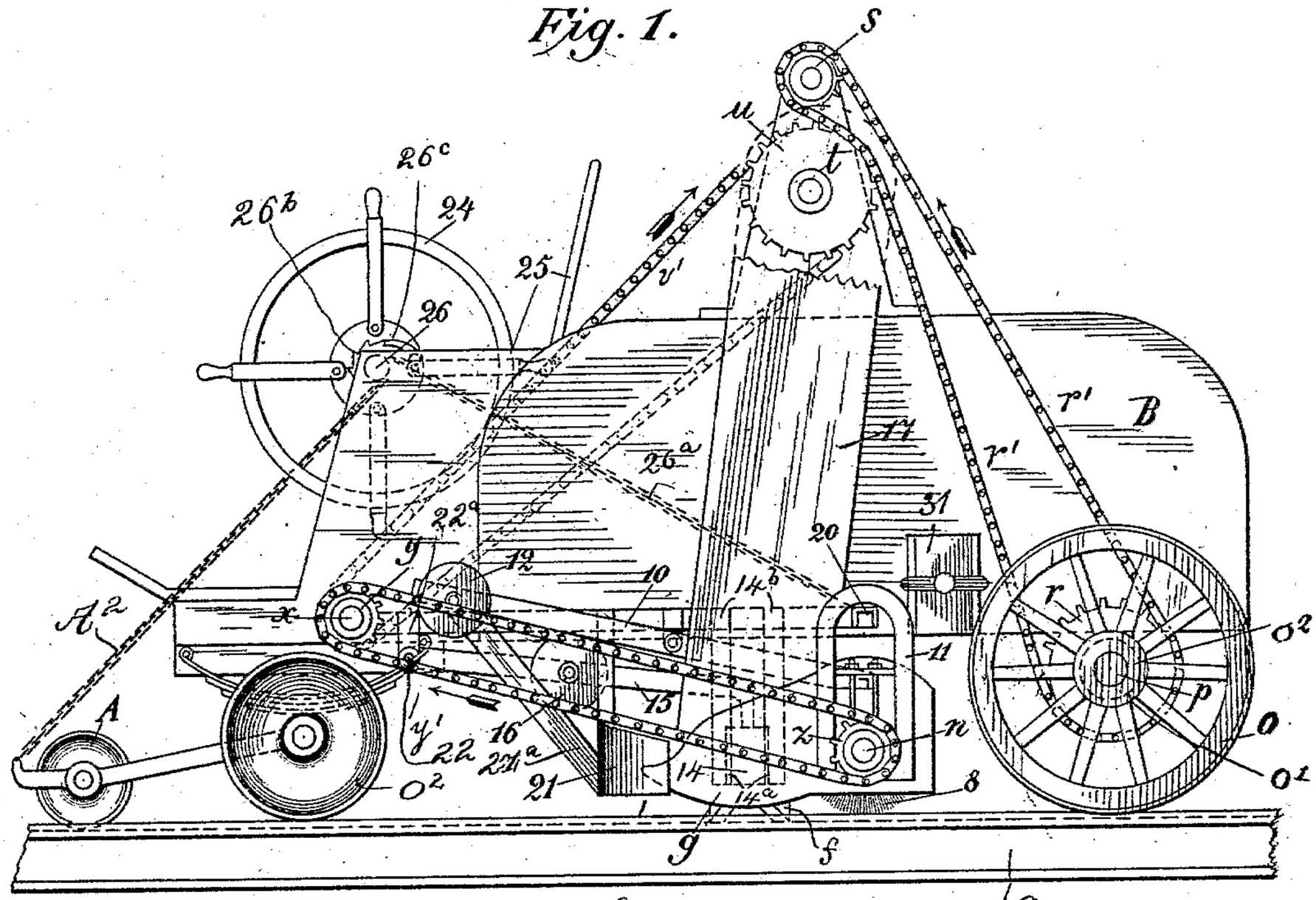
C. T. BISCHOFF.

STREET RAILWAY RAIL CLEANER.

No. 556,731. Patented Mar. 24, 1896.

Fig. 1.



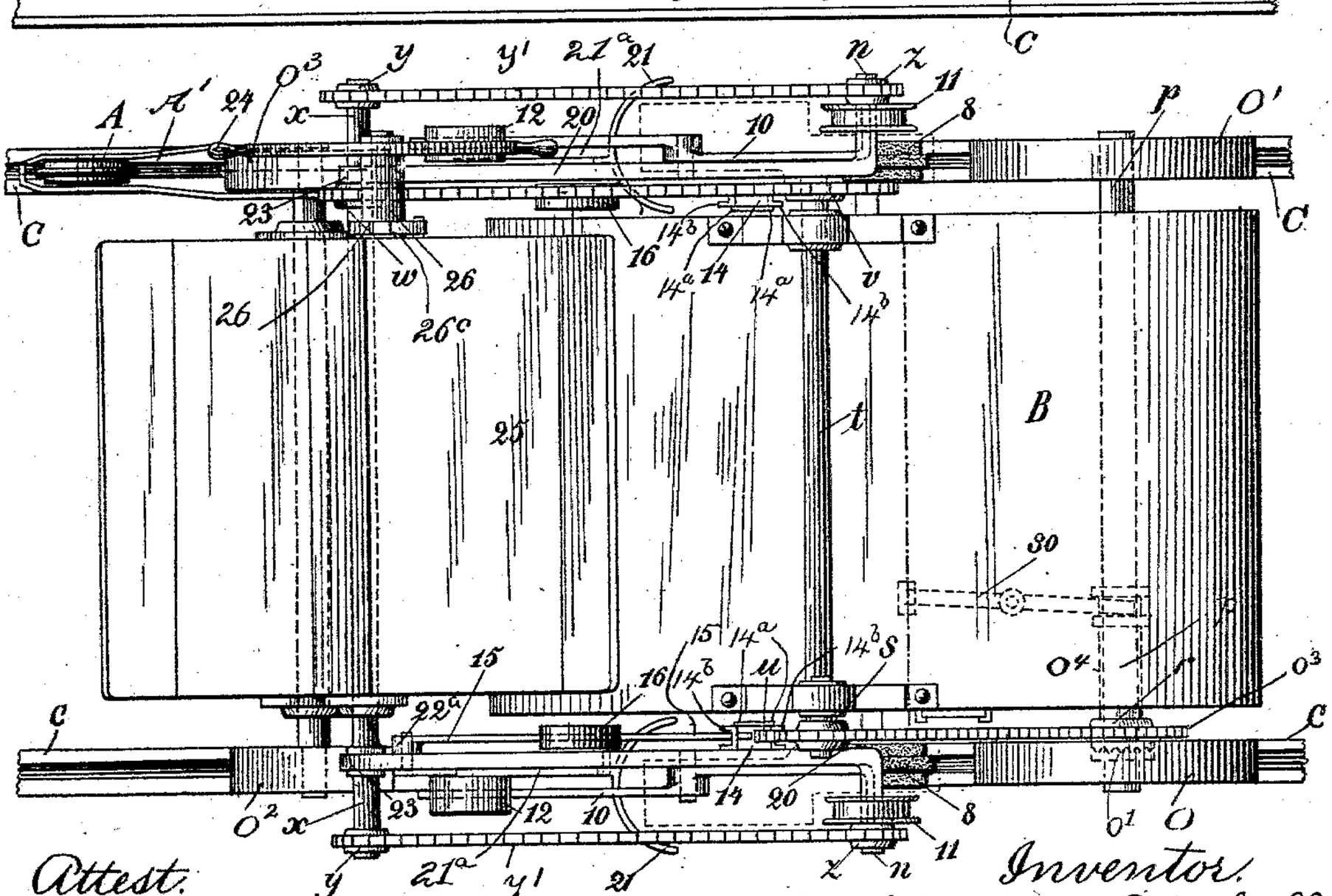


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Fig. 2.

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Fig. 3.

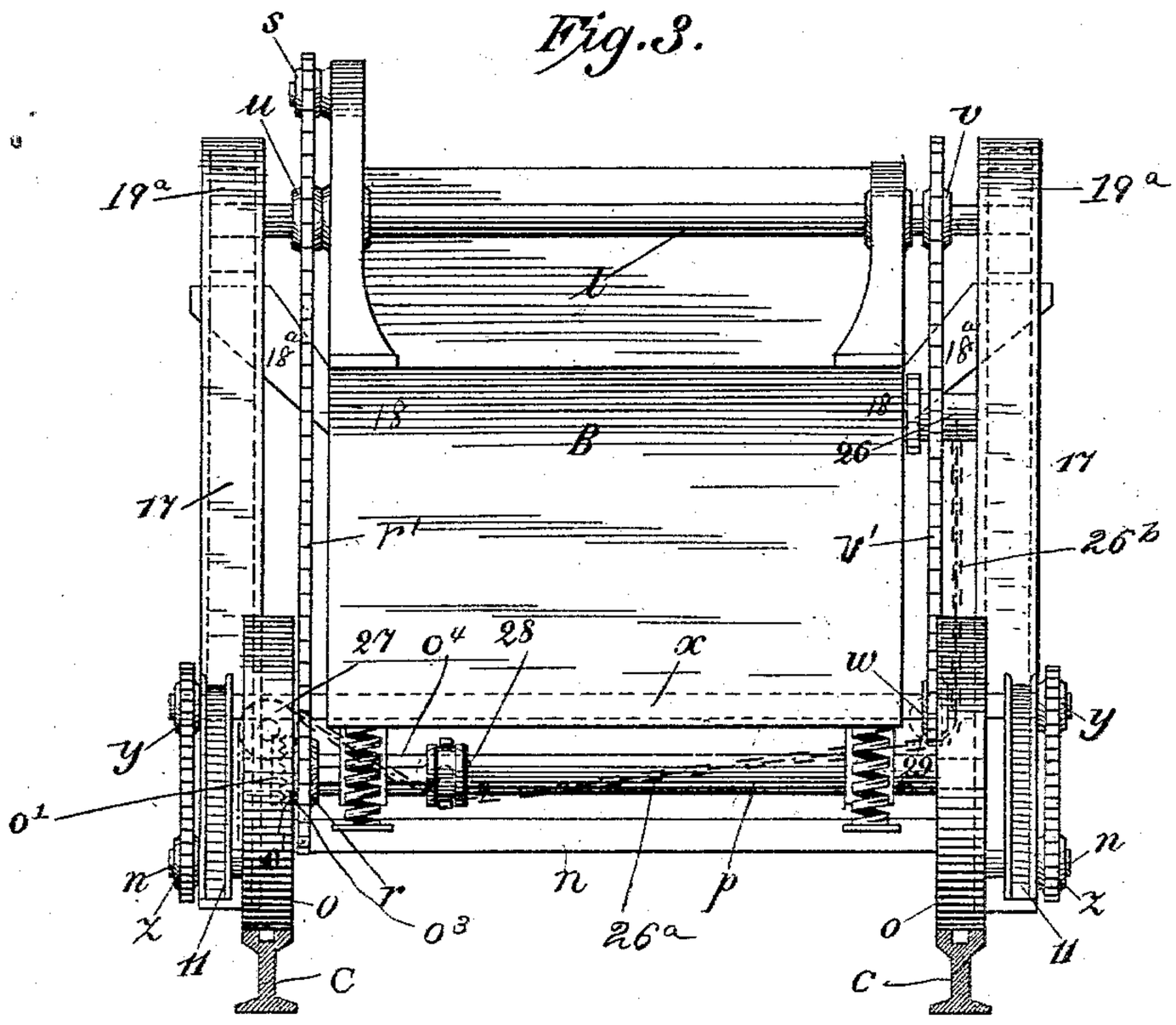

Fig. 8.

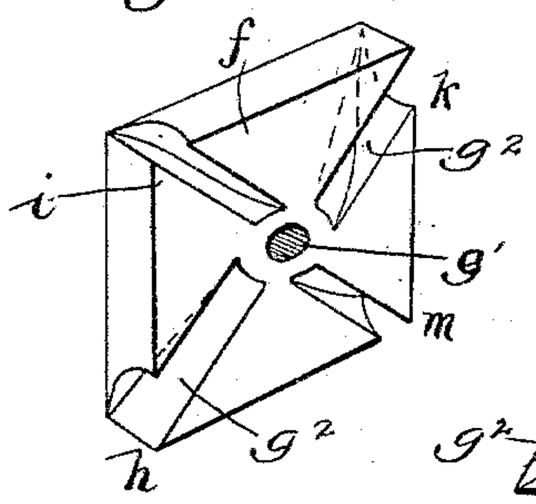

Fig. 7.

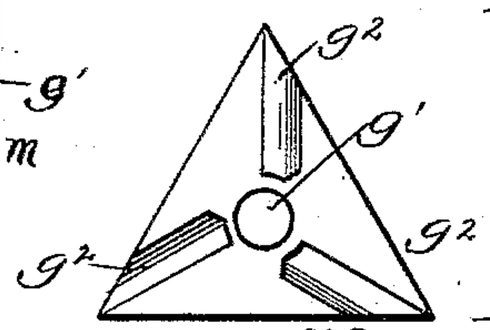

Fig. 7a.

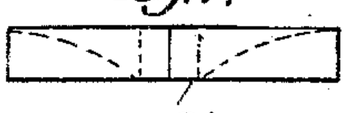

Fig. 4.

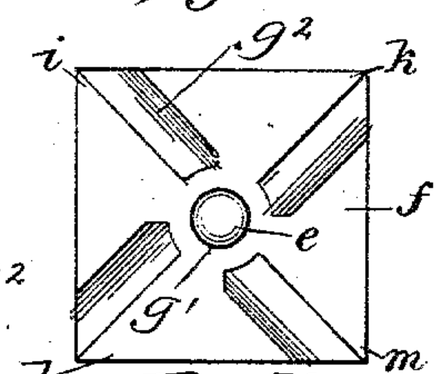

Fig. 4a.

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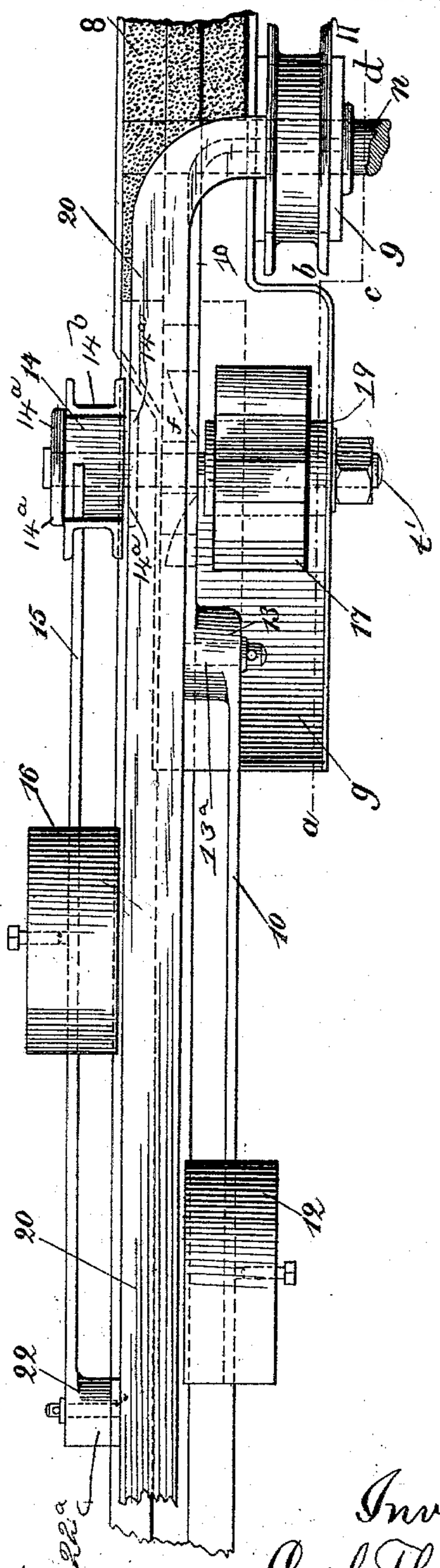

Fig. 5.

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STREET RAILWAY RAIL CLEANER.

No. 556,731. Patented Mar. 24, 1896.

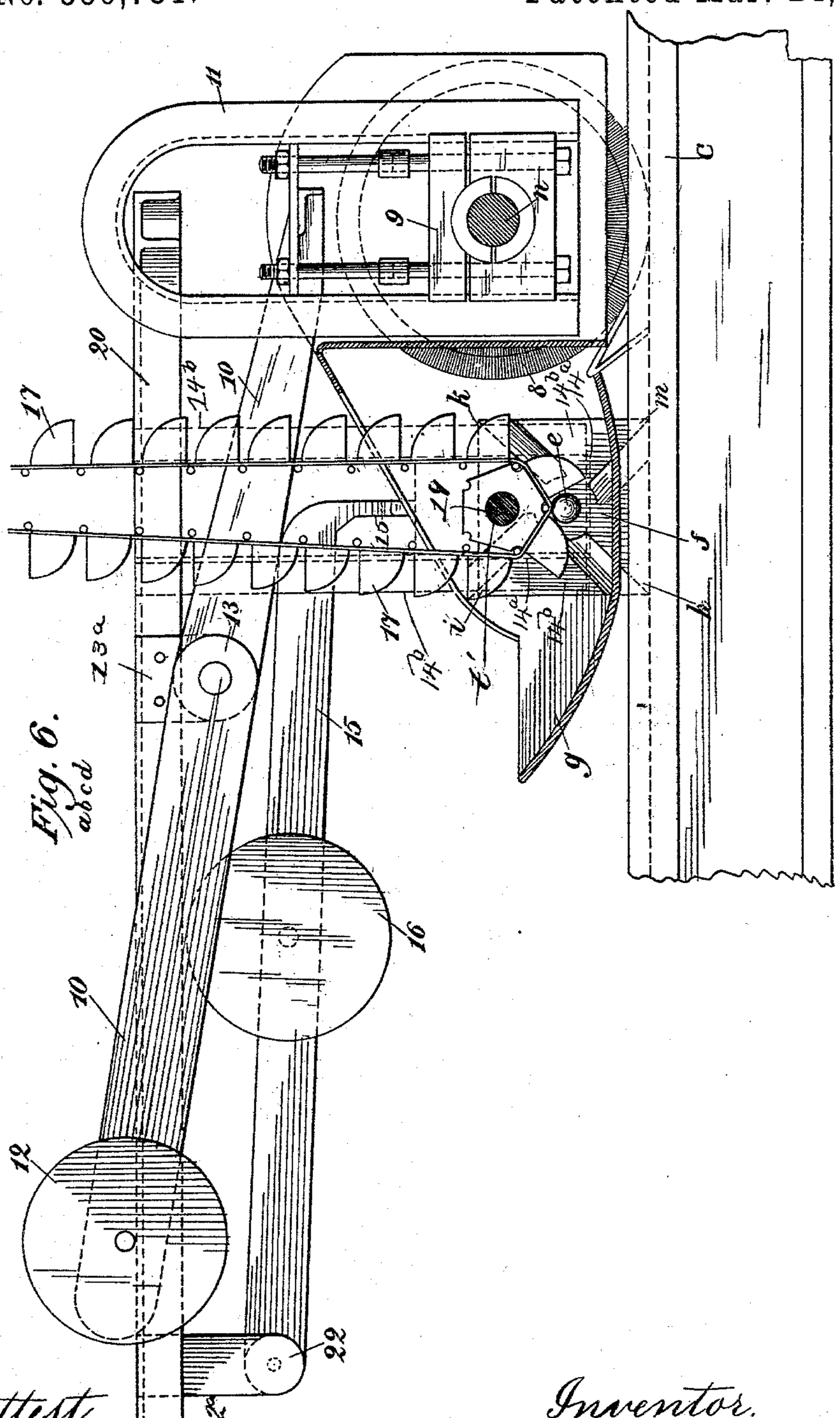

Fig. 6.
a b c d

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UNITED STATES PATENT OFFICE.

CARL THEODOR BISCHOFF, OF HAMBURG, GERMANY.

STREET-RAILWAY-RAIL CLEANER.

SPECIFICATION forming part of Letters Patent No. 556,731, dated March 24, 1896.

Application filed April 12, 1893. Serial No. 470,119. (No model.) Patented in Germany November 16, 1892, No. 70,400, and in England March 17, 1893, No. 5,745.

To all whom it may concern:

Be it known that I, CARL THEODOR BISCHOFF, a citizen of the free State of Hamburg, and a resident of Hamburg, in the Empire of Germany, have invented new and useful Improvements in Machines for Cleaning Street-Car or Tramway Rails, (for which I have obtained a patent in Germany, No. 70,400, dated November 16, 1892, and a patent in Great Britain, No. 5,745, dated March 17, 1893,) of which the following is a specification.

The object of my invention is to provide machines for cleaning street-car or tramway rails with improved cleaning devices for removing dirt, mud, ice, snow, or other matter from the grooves of the rails.

My improvement consists in novel features of construction, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine for cleaning street-car or tramway rails, the top of the elevator being broken away. Fig. 2 is a plan view of the same, the elevators and pans or shoes being omitted. Fig. 3 is a rear view of the machine. Fig. 4 is a side elevation of the scraper. Fig. 4ª is an edge view thereof. Fig. 5 is a detail plan view of the middle portion of the near side of the machine shown in Figs. 1 and 2. Fig. 6 is a detail vertical longitudinal section of the machine on the line *a b c d* of Fig. 5. Fig. 7 is a side elevation of a modified form of scraper. Fig. 7ª is an edge view thereof. Fig. 8 is an inside perspective view of the form of scraper shown in Fig. 4.

The frame of the machine is mounted on supporting-wheels O O′ O² O³, located over the grooved rails C. A is a guide-wheel for the machine, adapted to run in a rail-groove. Between the supporting-wheels is located a box B, into which the matter removed from the grooves of the rails is discharged. Located on opposite sides of the machine are trays or shoes *g*, into which the matter removed from the rails is deposited. Each tray or shoe *g* has located within it on one side thereof and projecting through its bottom a metal scraper *f*, loosely mounted on an axle *e* projecting from a bearing-block 14, guided vertically by flanges 14ª and supported between channel-bars 14ᵇ. The scraper *f* is shown in detail in Figs. 4, 4ª and 8, where it is represented as of square form, and in Figs. 7 and 7ª, where it is represented as of triangular form. Each of the square scrapers is constructed with wings or corners *h i k m*, with a central axle-opening *g′* for the axle, and with shovel-shaped grooves *g²* extending from the wings to points near the axle-opening and approximately radial to the latter.

On the forward movement of the machine the scrapers slide in the grooves of the rails, and any matter or water in the grooves of the rails is forced up one of the grooves of the scraper and discharged into the shoe from the side of the scraper. As soon as a wing *h* of the scraper comes in contact with an obstacle the scraper makes a quarter-turn on its axle and thus passes over every obstacle arising from the imperfections of the rails or the damaged condition of the same. Whenever a fresh obstacle presents itself the scraper takes a further quarter-turn, and this is repeated every time there is any obstacle met with during the journey—namely, at the commencement the wing *h* attends to the cleaning of the groove, then the wing *i* comes in action after a quarter-turn of the scraper, and upon further movement of the scraper taking place the wings *k* and *m* will do similar work. As it is requisite that the pressure of the scraper should be regulated, the bearing 14 is pressed downward by the turned-down end (see Fig. 6) of a lever 15, fulcrumed at 22 to the arm 22ª of a lever 20. Located on the lever 15 is an adjustable weight 16, which causes the lever 15 to press on the bearing, and thereby the required pressure is obtained. The levers 20 are fulcrumed to the axle *x* at 23.

8 are circular brushes fitted in the rail-groove and located in rear of the scrapers and within the rear portion of the shoes, which are adapted to brush into the shoes all matter in the grooves and on the rails which has not been taken up by the scraper. Each of the brushes is secured onto an axle *n*, mounted in a sliding bearing 9, suspended

from a lever 10, fulcrumed at 13 to the arm 13^a of the lever 20 and provided with a sliding weight 12. The bearing 9 slides in an inverted-U-shaped channel-bar 11. The matter which accumulates in the shoe *g* is removed therefrom by means of an elevator 17 arranged alongside the scraper and discharged through an opening 18 into the box B by means of the chute 18^a. 19 is a five-sided wheel secured to a lower axle, *t'*, and over which the elevator is carried at its lower end. The upper end of the elevator is carried at its upper end on a similar wheel 19^a on an axle *t*. It will be seen that by this manner of arranging the cleaning devices with sliding weights an adjustable pressure of the same is obtained upon the scraper and brushes. Located on the nave o^2 of the rear supporting-wheel, O, is mounted one half, *o'*, of a clutch, Figs. 1 and 3, and upon the axle *p*, which connects the two rear supporting-wheels is mounted a chain-wheel *r*, which is provided with the other half, O^3, of the clutch and with a sleeve o^4. Clutch-lever 30, connected with the sleeve o^4, serves to control the clutch.

The starting and stopping of the cleaning device takes place at the will of the driver by means of chains connected with the clutch-lever. When the chain-wheel *r* is clutched with the supporting-wheel O by means of the lever 30, the cleaning devices are put in operation as soon as the machine is moved forward. Around the chain-wheel *r* is passed an endless link chain *r'*, which is also passed around the loose chain-wheel *s*. The outside of the chain is also passed over the chain-wheel *u*, which is fixed on the upper axle, *t*, in order to cause this wheel to turn in a different direction. On the axle *t* is mounted a fixed chain-wheel *v*, Figs. 2 and 3. From this chain-wheel a link chain *v'* leads to the chain-wheel *w*, Fig. 2, which is mounted on the axle *x*. On the axle *x* is a chain-wheel *y*, Figs. 1 and 2, over which a link chain *y'* is also laid and which drives the chain-wheel *z*, fixed on the axle *n*, which carries the circular brush 8, Figs. 1 and 6, and puts it in motion from left to right on the forward movement of the machine. The elevator is moved by means of the upper axle, *t*, the buckets of the elevator being conducted over a correspondingly-formed wheel 19^a to the wheel 19 on the lower axle, *t'*. The elevator is surrounded by a sheet-iron casing.

21 are semicircular guard-plates for the trays or shoes, secured by arms 21^a to the levers 20. The cleaning devices are located on both sides of the machine, so that both rails may be cleaned simultaneously.

In order that the machine may travel other ways than on rails it is necessary that the depending parts of the same may be raised from the ground, and for this purpose the following parts are fixed to or suspended from each one of the levers 20: An inverted-U-shaped channel-iron guide-bar 11, carrying a sliding bearing 9, channel-iron guide-bars 14^b, carrying the bearing 14, a guard-plate 21, a lever 10 of the first order, and the end 22 of a lever 15 of the third order. For the purpose of raising the levers 20 the hand-wheel 24 is provided, which can be managed from the driver's seat 25. The wheel 24 is carried on a short axle 26, onto which a chain 26^a is wound, leading from the levers 20, and is provided with a pawl (26^b) and ratchet (26^c) mechanism. The chain 26^a passes over rollers 27, 28, and 29, and is connected with the lever 30 and serves the additional purpose of throwing the clutch into and out of gear, and thereby sets at rest the driving mechanism of the machine, when, for instance, the whole machine travels out of the grooves and off of the rails. The frame A' of the guide-wheel A is connected by a chain A^2 with the axle of the hand-wheel, so that when the latter is turned the guide-wheel will also be lifted or lowered. The door 31 is provided for emptying the box B.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A rotatable scraper having corners and a face formed with plow-shaped grooves, and an axle upon which the scraper is mounted so as to yield and ride over an abnormal obstacle and present another corner; substantially as described.

2. A rotary scraper having four corners and a face formed with plow-shaped grooves extending inward from the corners, and an axle upon which the scraper is mounted so as to yield and ride over an abnormal obstacle and present another corner; substantially as described.

3. The combination of the rotatable scraper, having corners, and plow-shaped grooves, the tray, the brush and the elevator; substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CARL THEODOR BISCHOFF.

Witnesses:
PAUL FISCHER,
ROBERT BRÄUTIGAM.