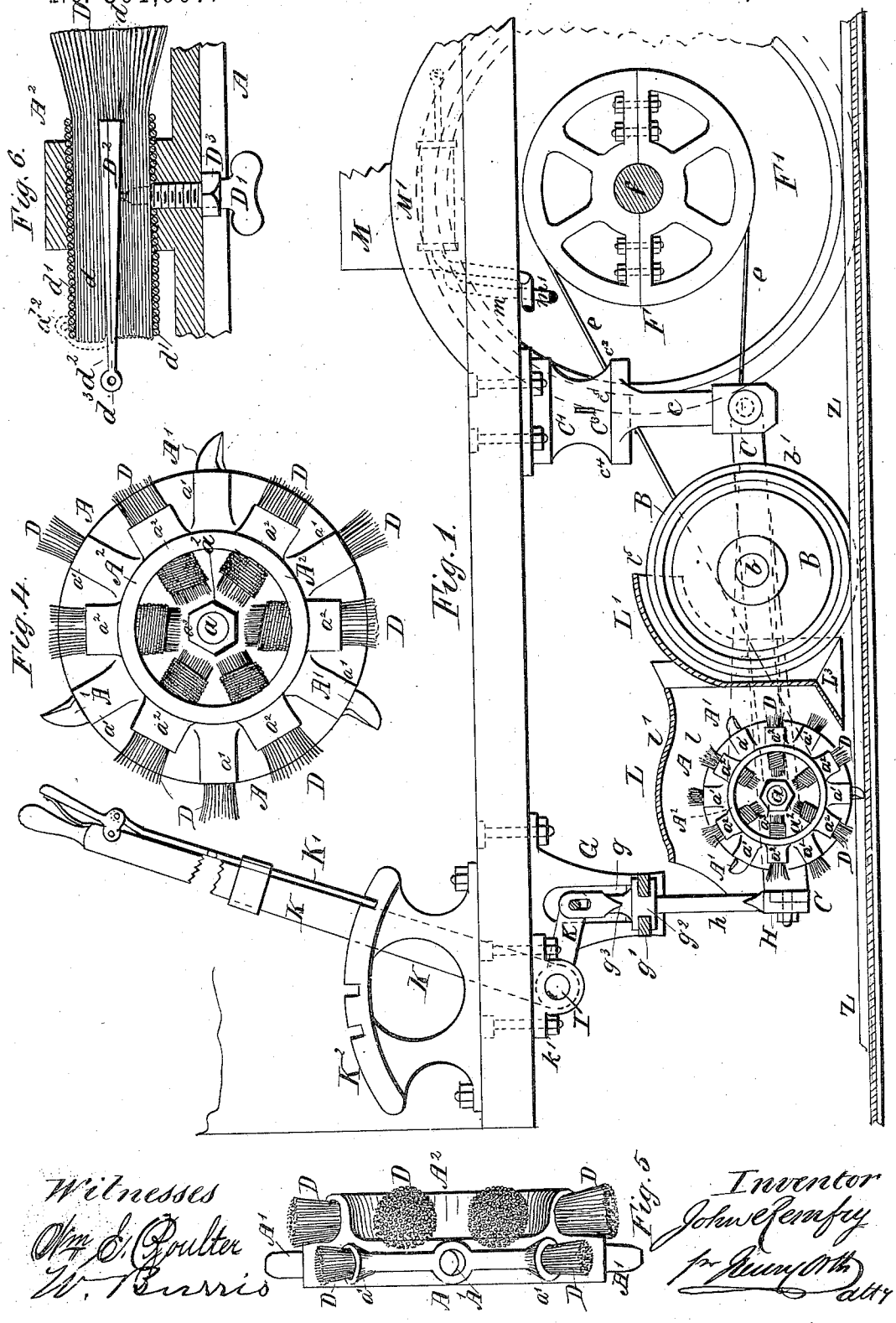
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J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007. Patented June 24, 1884.



Witnesses
Wm. J. Poulter
W. Burris

Inventor
John Remfry
per Munn & Co
Attys

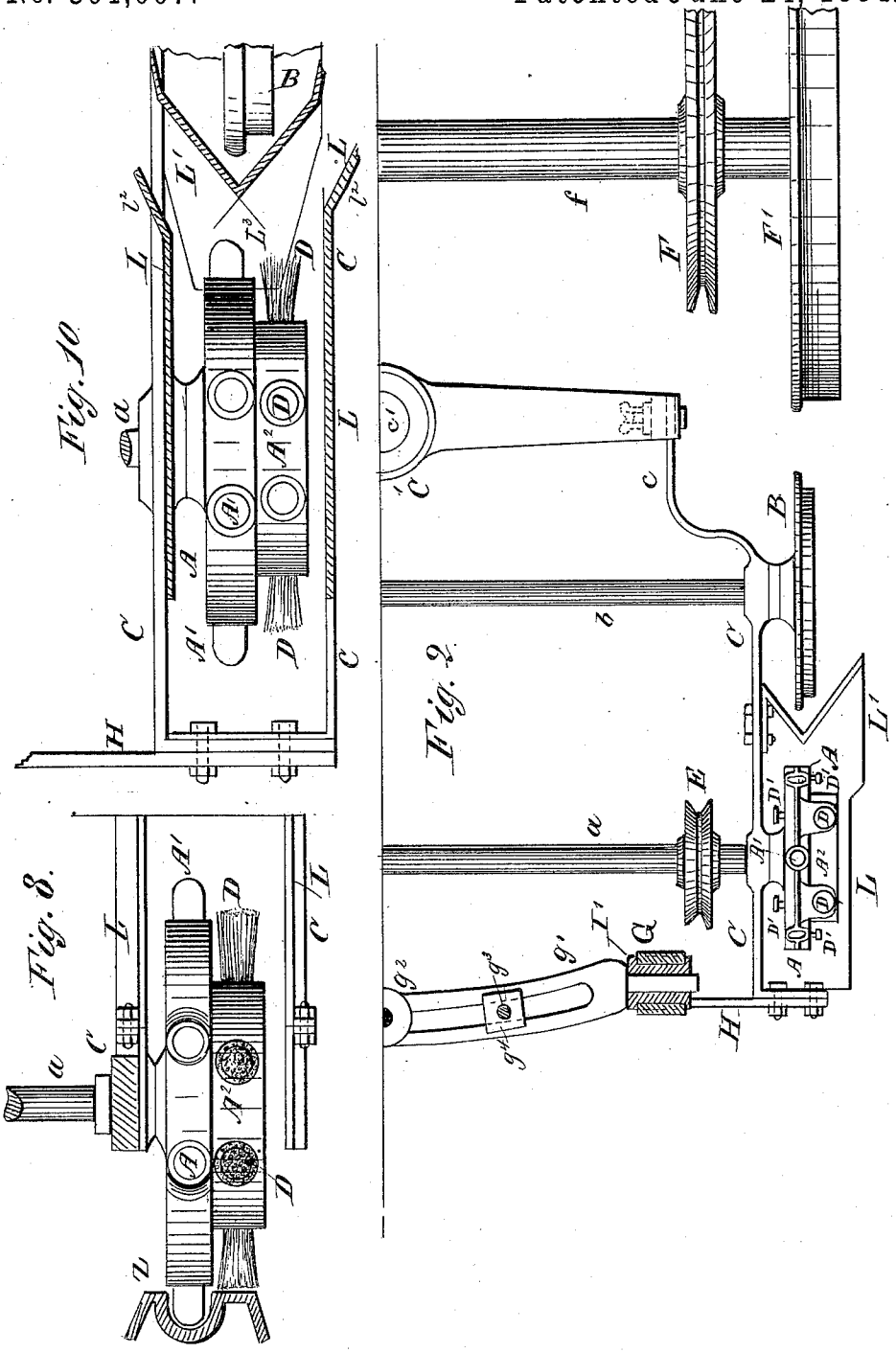
N. PETERS. Photo-Lithographer, Washington, D. C.

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J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007. Patented June 24, 1884.



Witnesses
William L. Coulter.
W. Burris

Inventor
John Remfry
per Henry Orth
Atty

N. PETERS. Photo-Lithographer. Washington, D. C.

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J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007 Patented June 24, 1884.

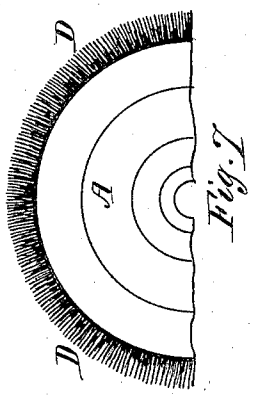


Fig. 1.

Fig. 3.

Witnesses
William L. Poulter
W. Rubris

Inventor
John Remfry
per Henry Atty

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 8 Sheets—Sheet 4.

J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007. Patented June 24, 1884.

Fig. 12a.



Fig. 12b.



Fig. 12c.



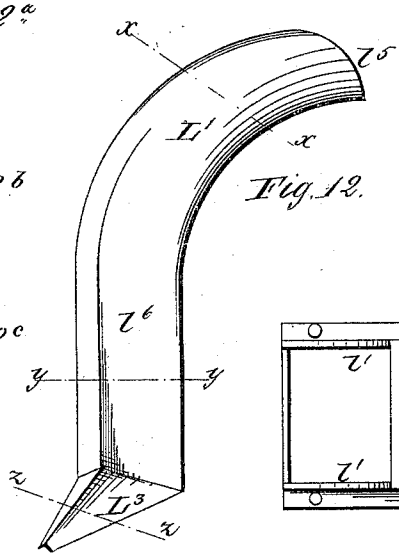


Fig. 12.

Fig. 11

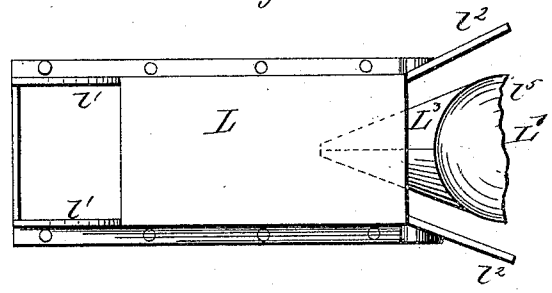
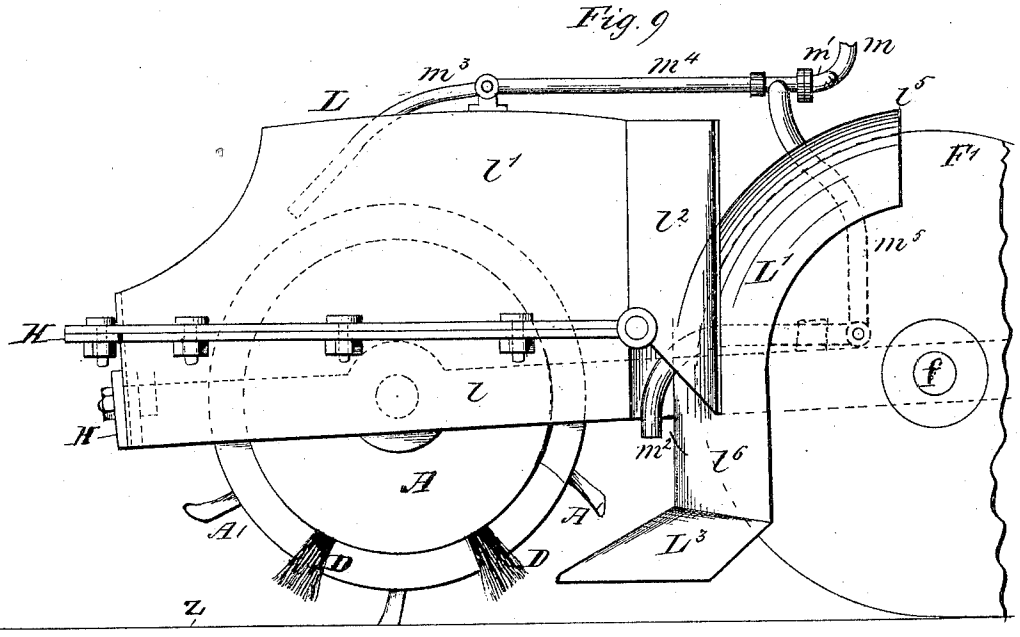


Fig. 9



Witnesses
W. E. Boulter.
G. W. Knotts

Inventor
John Remfry
per Henry Orth
his att'y

N. PETERS. Photo-Lithographer. Washington, D. C.

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J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007. Patented June 24, 1884.

Fig. 13.

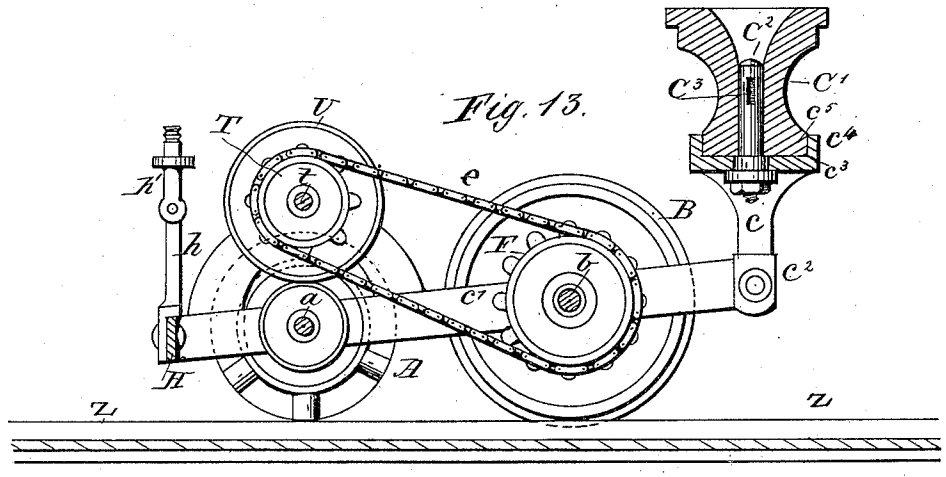
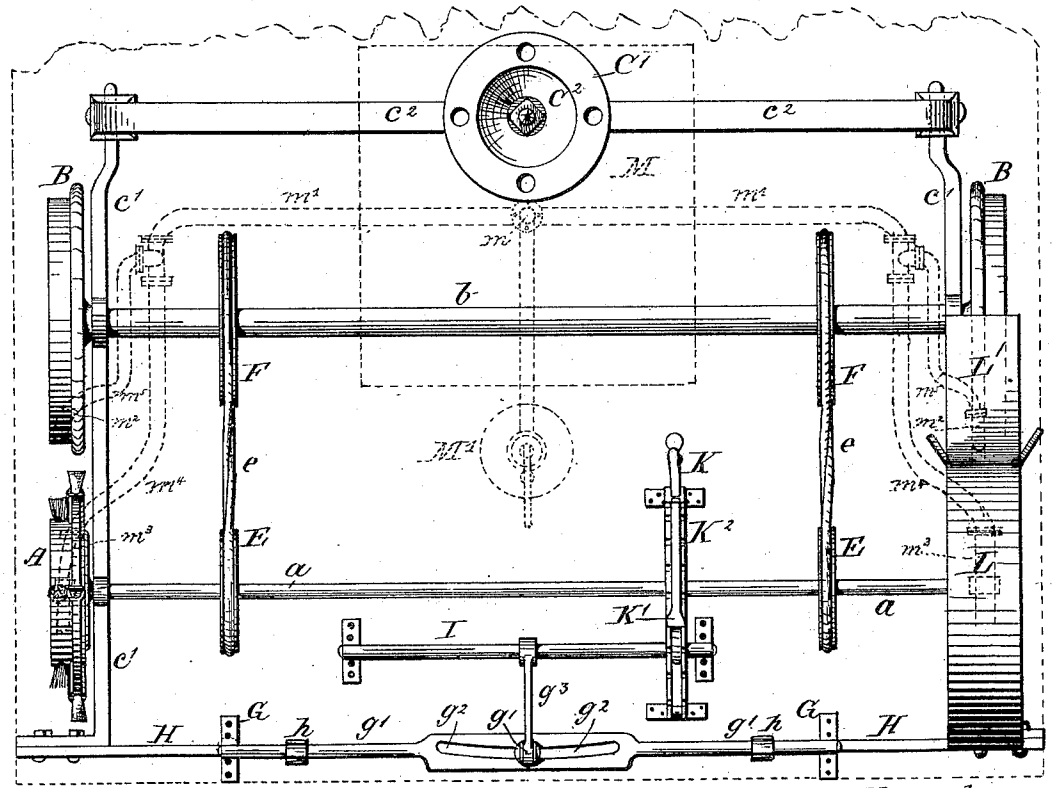


Fig. 2a.



Witnesses
H. E. Coulter,
F. W. Bugbee.

Inventor
John Remfry
by Henry Orth
his atty

N. PETERS. Photo-Lithographer. Washington. D. C.

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J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007. Patented June 24, 1884.

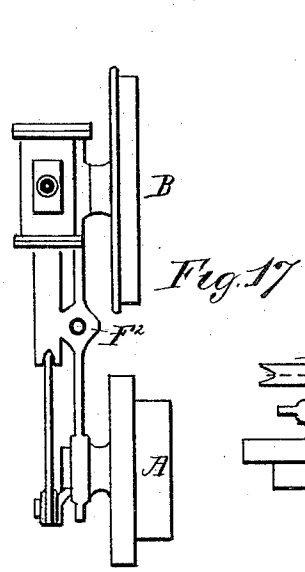


Fig. 17.

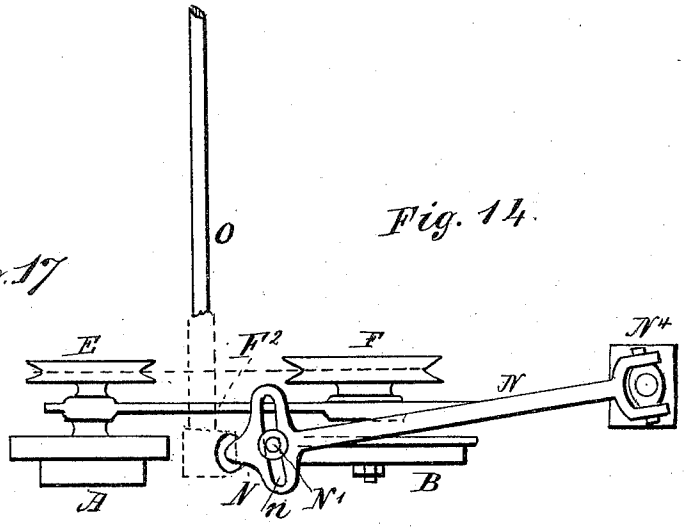


Fig. 14.

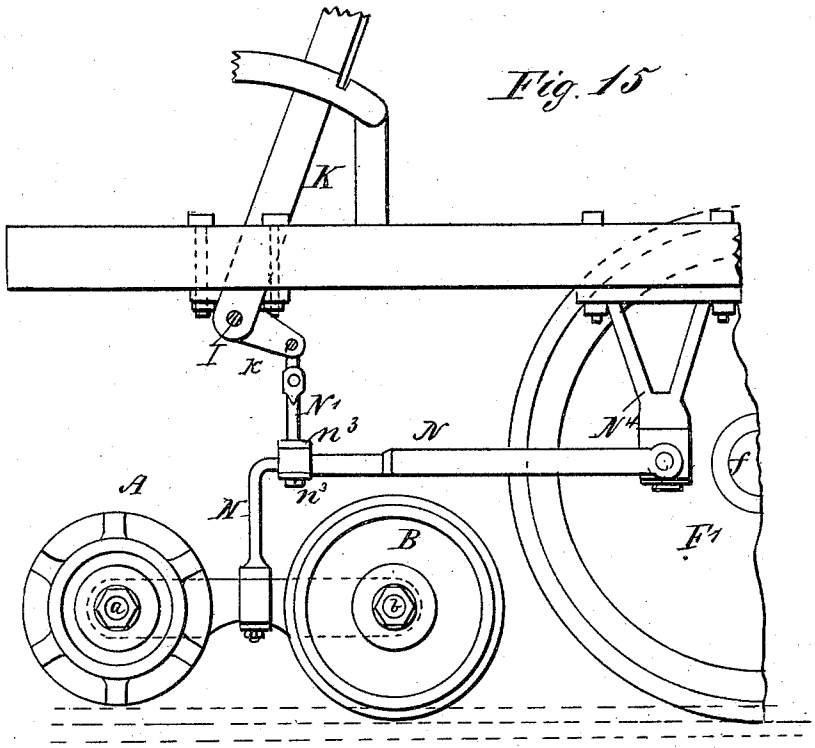


Fig. 15.

Witnesses
William A. Poulter
W. Morris

Inventor
John Remfry
per Henry Otto
his att'y.

N. PETERS. Photo-Lithographer. Washington, D. C.

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J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007. Patented June 24, 1884.

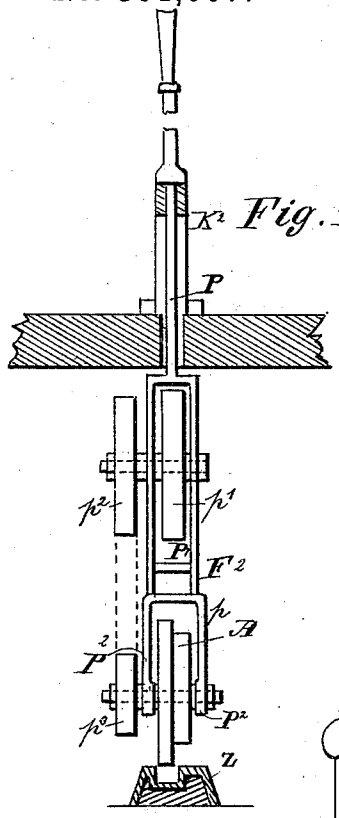


Fig. 19.

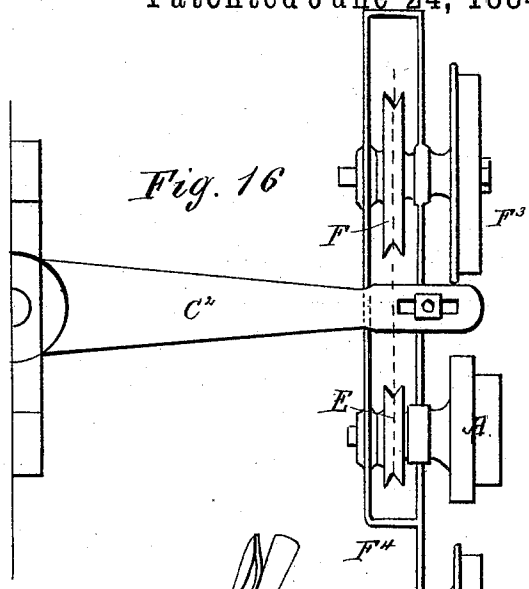


Fig. 16.

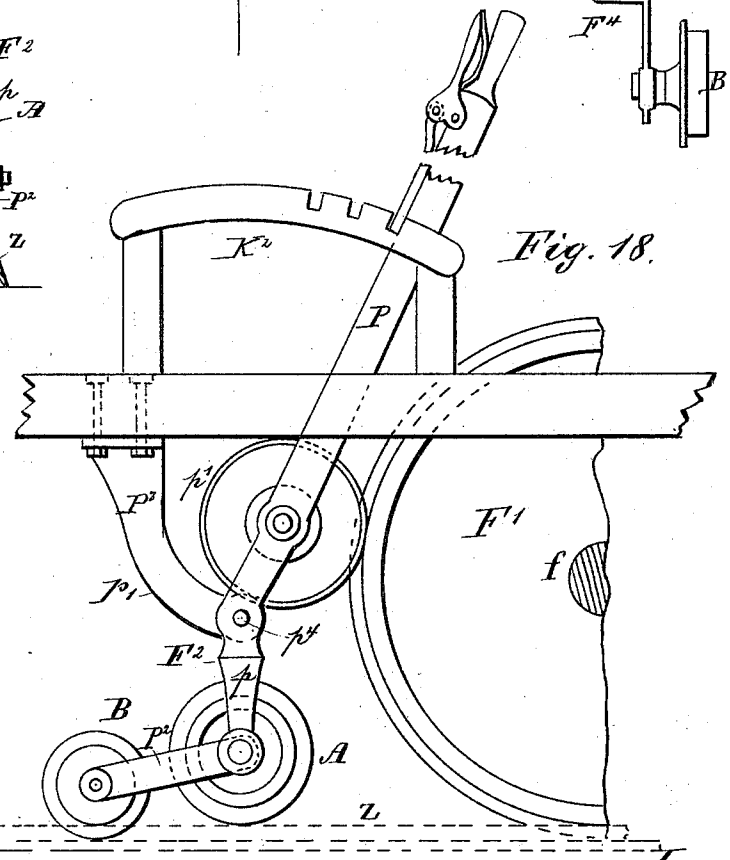


Fig. 18.

Witnesses.
William E. Coulter.
W. Burris

Inventor.
John Remfry
per Henry Orth
his att'y

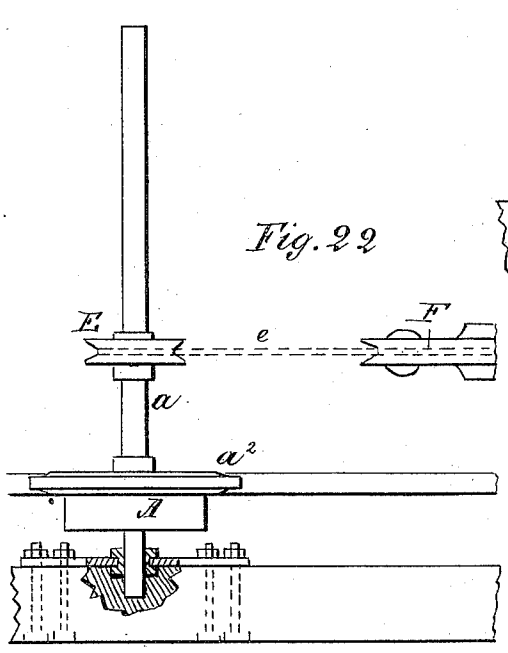
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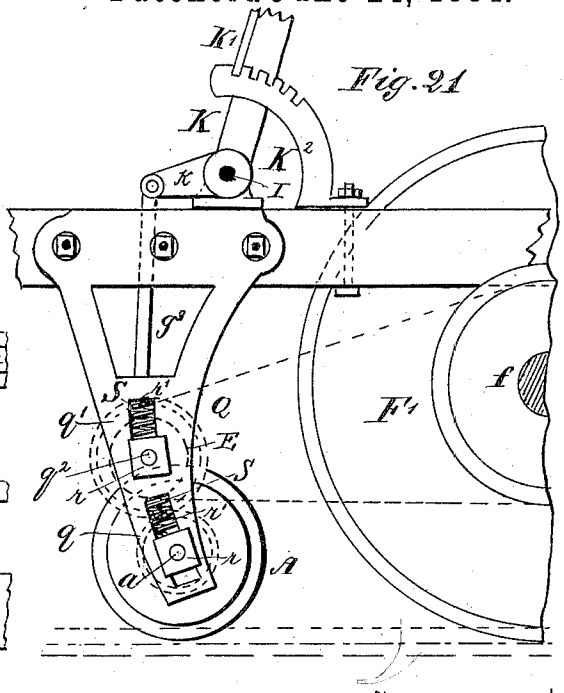
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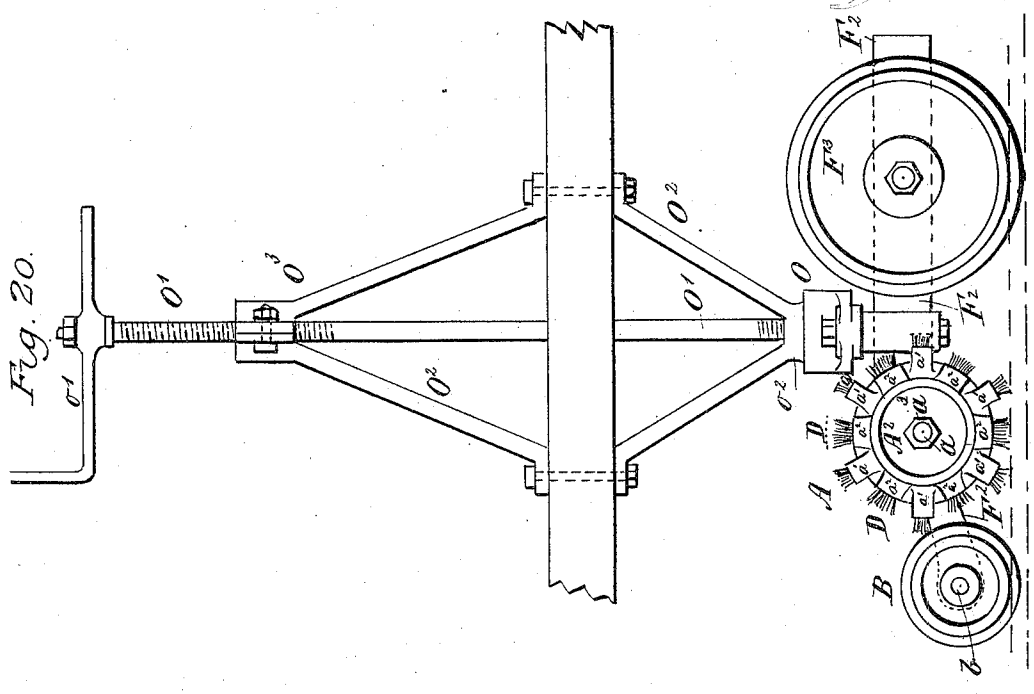
J. REMFRY.

MACHINE FOR CLEANING TRAM RAILS.

No. 301,007. Patented June 24, 1884.







Witnesses.
William L. Boulter.
W. Burris

Inventor
John Remfry
per Henry Orth
his att'y

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN REMFRY, OF CALCUTTA, INDIA.

MACHINE FOR CLEANING TRAM-RAILS.

SPECIFICATION forming part of Letters Patent No. 301,007, dated June 24, 1884.

Application filed December 4, 1882. (No model.) Patented in India December 1, 1881, No. 1,008, and in England April 12, 1882, No. 1,734.

To all whom it may concern:

Be it known that I, JOHN REMFRY, a citizen of the Empire of India, residing at No. 5 Fancy Lane, in Calcutta, India, have invented certain new and useful Improvements in a Machine for Cleaning Tram-Rails; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention has for its object to more expeditiously and more effectually clean the tracks (grooves and rails) of tramways; and it consists in the construction of mechanism and the combination of mechanisms whereby the above object is attained, substantially as hereinafter fully described, and as specifically pointed out in the claims.

It is well known that stones and rubbish, &c., fall into and accumulate in the grooves of tramways, and mud, dirt, &c., cover the face of the rail, not only impeding the easy running of the car and jolting the passengers, but also straining and often derailing the car, causing injury thereto, and resulting in considerable delay, inconvenience, and annoyance to the passengers. The present remedy against this is the employment of men with scrapers to clean the line, except when such lines are cleared of snow, when, in addition to the scrapers, revolving brushes are used.

In the accompanying drawings, Figure 1 is a side elevation of my improved mechanism, showing its connection and relation to a dummy or other car. Fig. 2 is a half-plan view, and Fig. 2^a is a like view, of the cleaner frame and wheels, the car-frame being shown in dotted lines. Fig. 3 is an end elevation of Fig. 1. Figs. 4 and 5 are face and edge elevations of the brush-wheel detached. Fig. 6 is a sectional view showing the manner of applying or attaching the brushes. Fig. 7 is a half-face view of a wheel having a continuous peripheral brush. Fig. 8 is an end view, and Fig. 9 a side elevation, of the brush and trailer wheels, the dust-casing, and deflector. Fig. 10 is a sectional plan of the dust-case. Fig. 11 is a top plan view thereof. Fig. 12 is a perspective view of the deflector-plate, and Figs. 12^a, 12^b, and 12^c are sections thereof on lines x x, y y, and z z of Fig. 12. Fig. 13 shows the means employed for driving the brush-wheels in elevation. Figs. 14 and 15 show by a plan view and in elevation a single cleaning mechanism. Fig. 16 shows by a plan view the wheel A driven positively. Fig. 17 is a detail view thereof. Figs. 18 and 19 show by a face view and front elevation the cleaning devices driven by frictional contact. Fig. 20 is a modification in the construction of the devices shown in Figs. 14 and 15, by a side elevation. Figs. 21 and 22 show, by a side elevation and a plan view, the mechanism that stops the cleaner-wheel in the track-groove.

Like letters of reference indicate like parts wherever such may occur in the above figures of drawings.

My improved appliances for cleaning tramways comprise, essentially, a frame adapted to be pivoted to the end of a car or truck, said frame supporting a pair of cleaner-wheels and a pair of trailer-wheels, the former being provided with a suitable dust-case and the latter with deflectors. They further comprise means to keep the brushes, scrapers, and deflector clean, and prevent dust by the application of water in jets or otherwise projected upon these devices from suitable jet-nozzles or rose-heads, or both. They further comprise means for elevating the cleaner and trailer wheels above the track, and also certain modified arrangements of devices whereby the results aimed at and the objects of my invention are attained, and, finally, they comprise improved means for forming the cleaner-brushes, all as I will now fully describe.

The carrying-frame C, in which are mounted the cleaner-wheels A and trailer-wheels B, is rectangular, as shown in Fig. 2^a, and consists of a front transverse girt, H, to which are rigidly bolted two longitudinal girts or side bars, c' c', and the latter are pivoted to a rear transverse girt, c^2. The latter girt has a central bearing, c, having an annular head, c^3, surrounded by a vertical flange, c^4, formed by recessing the head, as more clearly shown in Fig. 13. Upon the under side of the car or

truck frame, and in proper position, is secured a bearing post or pillar, C′, the lower annular head, c^5, of which fits into the annular recess of the bearing *c*, and C^2, Fig. 13, is a coupling-pin or bolt that passes through both bearings C′ *c* and is secured in the former by means of a key, C^3, as plainly shown in said figure. It will be observed that by means of the described construction and arrangement the frame C is adapted to rotate on the bearing C′ and maintain its proper position relatively to the truck when rounding a curve, and as the side bars, *c′ c′*, are pivoted to the rear transverse girt, c^2, the wheels A B, by means to be hereinafter described, can be lifted clear of the track when this becomes necessary, either to pass over an obstruction of such a nature as not to be removed by the cleaner-wheels or when this becomes necessary from any other cause. The cleaner and trailer wheels A and B are supported from shafts *a* and *b*, respectively, extending from side to side of the frame C and rotating in bearings formed in the side bars, *c′*, thereof. The cleaner-wheels A rotate over the tram-groove, while the trailer-wheels B have each a peripheral flange, *b′*, running in the groove and their peripheries on the rail. These trailer-wheels serve to guide the cleaner-wheels and hold them over the track. As shown, the wheel A is constructed to carry scrapers or cutters A′ or brushes D, or both. The scrapers are preferably made of steel, having a rounded cutting or scraping face to avoid their catching in the joints of the rails, said scrapers running in the rail-groove, and are secured, by means of set-screws D′, in tubular hubs or bosses *a′*, formed on wheel A.

In practice I prefer to employ both scrapers A′ and brushes D, alternating with each other on the periphery of the wheel A, the brushes sweeping the dirt and other matter scraped from the groove out of it. The cleaner-wheels have each an annular outwardly-projecting flange or hub, A^2, provided with tubular bosses a^2, for the reception of brushes D, that serve to clean the plane surface of the rail Z and sweep away any dirt scraped out of the rail-groove that may collect on top of the rail. Both the scrapers A′ and brushes D are secured in their tubular bosses by means of set-screws D′, so that they may be adjusted to compensate their wear or removed when worn.

The wheels A are keyed to their shaft *a*, and held thereon by means of nuts a^3. Said shaft carries two pulleys, E, belted to corresponding pulleys, F, on the axle of the front wheels, F′, of the truck, by a cross-belt, *e*, so as to cause the wheels A to rotate in a direction the reverse of that in which the truck-wheels rotate and throw the dirt forward.

Instead of the pulleys E F, sprocket-wheels and chains may be employed, as will be readily understood, and instead of driving the shaft *a* from the truck-axle it may be driven from the trailer-wheel axle *b*, in which case one of the wheels B will be rigidly secured thereto, and the pulleys E may in this case also be driven by belt or rope from pulleys F on the trailer-wheel axle or by means of sprocket-wheels and chains.

If desired, both wheels B may be rigidly secured to their axle *b;* but it will materially facilitate the turning of curves when one of said wheels is loosely mounted on the axle.

The following devices are employed for lifting the frame C with the cleaner and trailer wheels clear of the track. A transverse bar, *g′*, has its extremities rigidly secured to guide-blocks I′, that lie in the vertical slots *g* of hangers or brackets G, bolted to the under side of the truck-platform. Upon the bar *g′* are secured at suitable points arms *h′ h′*, to which are pivoted one end of links *h*, the opposite end thereof being attached to the front transverse girt, H, of the frame C. Centrally the bar *g′* has a segmental slot, g^2, (more plainly shown in Figs. 2 and 2^a,) on an arc of a circle drawn from the axis of the pivotal connection of said frame C with the truck-body. A link, g^3, having a grooved head, g^4, Figs. 1 and 2, is free to move in said slot, and at its opposite end is pivoted to a crank-arm, *k*, secured to a transverse rod, I, to which a shifting-lever, K, is attached, said rod having its bearings in hangers bolted to the under side of the truck-platform. The lever K projects above said platform, and is provided with the usual retaining spring-pawl, K′, that takes into the teeth of a sector, K^2, to lock the lever into any position it may be moved. It is obvious that when the lever is shifted from the position shown in Fig. 1 toward the forward end of the car the frame C, through crank *k*, link g^3, bar *g′*, arms *h′*, and links *h*, will be lifted and the wheels A B held clear of the track Z, in which position the frame C may be held any desired length of time by locking the lever K to the sector.

It is not absolutely necessary to provide slide-blocks for the bar *g′*, as the ends of the bar may be supported from the hangers and move vertically therein, and means—such as collars or nuts—provided to prevent endwise movement of said bar. As the link g^3, that connects the bar with the lever K, is free to move in the slot g^2, and as said slot is a segment of a circle the center of which is that of the pivotal axis of the frame, said frame can oscillate on its pivot without interfering with the lever-connection when the apparatus is rounding a curve.

As above set forth, the cleaner-wheels A may be provided with a series of brushes, or, as shown in Fig. 7, said wheels may be provided with a continuous brush attached to their annular flanges A^2. When a series of brushes are employed, I construct them of steel wire, as follows: I preferably employ steel wire, which may be cut into suitable lengths and doubled and bunched, or, as shown in Fig. 6, such wire may be cut into lengths of single wires *d*, formed into bunches of suitable di-

ameter, which are then tightly bound at one end for a distance of about three or four inches with steel wire d'. To prevent the wires from working loose, I force a tapering wedge, D^2, (of wrought or malleable metal triangular in cross-section,) from the brush or free end of the wires centrally through the bound part thereof, and then bend the small end d^2 of the wedge over the bound end of the brush, as shown in dotted lines, Fig. 6. In practice I prefer to use a wedge, the tapering end of which terminates in an eye, d^3, and pass the end of the wire d', with which the brush is bound, through said eye d^3, to prevent the wedge from working loose and falling out of the brush during the operation of cleaning. The brushes so made are then forced through the bosses a' a^2 of the peripheries of the wheel A and the hub A^2 thereof, so that the extremity of the bound portion will lie close to the nut a^3 on the shaft a, and said brushes are then secured by means of pointed set-screws D′, that are forced into the bound portion of the brushes, as shown in said Fig. 6, whereby the brushes are held securely, the set-screws D′ being held against rotation by check-nuts D^3. When the brush wears, the set-screw D′ can be loosened and the brush lowered to take up the wear, or, when the brush becomes bent or too much worn, to remove it altogether.

The cleaner-wheels A are each covered by a dust-case, L, which is preferably open both in front and rear, as shown in Figs. 1 and 10, though it may be closed in front, as shown in Fig. 2^a. The case is composed of two sections, l l', bolted together and hinged at their rear ends, so that by removing the bolts the upper section, l', may be swung open to afford access to the cleaner-wheel if this should become necessary. The section l is bolted or otherwise secured to the longitudinal girts of the frame C, and also to the front transverse girts, H. At the rear end the dust-case has laterally-projecting deflecting-wings l^2, the lower portion being cut away, as shown at L^2, Fig. 9, so that the top of the case may be swung back.

L′ is a deflector-plate attached to the longitudinal girts of the frame C in any convenient manner in front of the trailer-wheel B. The upper portion, l^5, of the deflector is approximately semi-cylindrical, as shown in Fig. 12^a, the lower portion, l^6, triangular, as shown in Fig. 12^b, and from this section projects a foot-piece, L^3, that is also triangular in cross-section, as shown in Fig. 12^c, and that extends forward close under the cleaner-wheels. The deflector serves to carry beyond the line of the rail any rubbish carried rearwardly by the brushes or cutters, as will be readily understood.

When the nature of the obstructions of the track is such as to adhere more or less to the brushes, cutters, and deflector, I remove the same by forcing water onto the parts. For this purpose I employ a water-tank, M, connected by pipe m, provided with a suitable stop-cock, with a distributing-pipe, m', arranged transversely underneath the car-platform and connected by flexible hose m^4 with a discharge-pipe, m^3, secured in any convenient manner to the longitudinal girts of the frame C, or to the top of the dust-case L, as shown in Fig. 9 and in dotted lines in Fig. 2^a, the said pipe m^3 passing through the top of the case and projecting in proximity to the cutters and brushes, a second flexible hose, m^5, being connected with a pipe, m^2, secured to the longitudinal girts of frame C and passing through the deflector L′, discharging water onto the foot-plate L^3 thereof.

The pipes m^2 m^3 may be provided with nozzles or rose-heads, and if the cleaner-frame is attached to a dummy or locomotive steam may be supplied to the jet-pipes from the boiler, instead of water from the tank M. The water is forced into the pipes by means of a small pump, M′, driven from the car-axle.

When the line of track is slippery or in ascending steep grades a sand-box is provided, and sand distributed on the rails in front of the truck-wheels or in front of the trailer-wheels, when the latter are employed as drivers for the cleaner-wheels, as is usual on railway-lines.

Under some circumstances, especially where a light cleaning apparatus is required, it may be found desirable to use separate carrying-frames for each pair of cleaner and trailer wheels. In this construction, as shown in Figs. 14 and 15, the wheels A B are mounted on the outer end of short shafts a b, respectively, which shafts have their bearings in a single girt, F^2, through which they pass, carrying on their inner ends the driving-pulleys E and F, above referred to. The girts F^2 are pivotally supported from vertical arms N′ of angular bars N, the rear ends of which are pivoted to hangers N^4, bolted to the under side of the truck-platform in lieu of the bearing C′, hereinbefore described. At or near the bent portion the bars N have a slot, n, forming an arc of a circle the center of which is that of the pivotal connection with their hangers N^4, to allow the girt F^2 to move laterally on the link g^3.

The devices for lifting both girts F^2 simultaneously to lift the cleaner and trailer wheels clear of the track, are the same as those above described. The lifting-lever K is secured to a cross-bar, I, that carries two cranks, k, to which are pivoted links g^3, that pass freely through the segmental slots n, formed at or near the bent portion of the supporting-bars N, and are held against vertical displacement by the heads g^2 of the links and a retaining nut and washer, as in Fig. 3, or by means of two retaining-nuts, n^3 n^3, as in Fig. 15. In the latter construction two cranks, k, are employed, one for each girt F^2, the transverse bar g' and slotted brackets G being dispensed with, while in the construction shown in Figs. 1, 2, 2^a, and 3 but one crank and link are employed with two cranks and links on the lifting-bar g'.

It is obvious that by means of the construc-

tion shown and described in reference to Figs. 14, 15, and 16 a much lighter apparatus is secured.

Instead of a single supporting-girt, F^2, for the cleaner and trailer wheels, a rectangular frame, F^4, Fig. 16, may be employed, said frame being preferably made of metal and of the form approximately shown, one of the side bars being extended to support the trailer-wheel in front of the cleaner-wheel, a driving-wheel, F^3, being employed, on the shaft of which is mounted the driving-pulley F, belted to pulley E on the cleaner-shaft.

Instead of the lifting devices hereinbefore described, the frame C or the supporting-girts F^2 may be raised to lift the cleaner and trailer wheels clear of the track by means of a screw-rod, C, passing through the truck-platform and working in a threaded sleeve or nut, O^3, said rod being suitably guided and braced by brackets O^2, bolted on the upper and under side of the truck-platform, as shown in Fig. 20. When the screw-rod is employed to lift the frame C, its lower end passes through the segmental slot formed in the cross-bar g', the connections being substantially the same as that with the link g^3, above referred to; and it will be obvious that on rotating the screw-rod O′ in the proper direction by means of the operating-crank o', the bar g' will be lifted in the slotted brackets G, and through the crank-arms h' and links h will lift the frame C. When the rod O′ is employed to lift the girts F^2, their supporting-rods N are connected together by a transverse bar, O, to which the lower end of the screw-rod is connected in the same manner as with bar g'—namely, by providing the transverse bar with a segmental slot to permit the necessary lateral displacement of the connected girts F^2 on the screw-rod O′, for purposes already explained.

The trailer-wheels may be placed in front of the cleaner-wheels and serve as guide-wheels to maintain the cleaner-wheels over the track, and driving-wheels F^3 may be mounted in the girts F^2, from which the cleaner-wheels are driven, instead of driving said wheels from the truck-axle or the trailer-wheel axle.

Instead of driving the cleaner-wheels positively, as above described, they may be driven by friction, as shown in Figs. 13, 18, and 19. In the former figure the trailer-wheel shaft carries a sprocket-wheel instead of a pulley, F, connected by chain with a sprocket-wheel, T, mounted on a shaft, t, that carries a friction-pulley, U, rotating in contact with a like pulley, u, on the cleaner-wheel shaft a, instead of pulley E. The sprocket-wheel T may also be driven from the car-axle, as will be readily understood.

In Figs. 18 and 19 the cleaner-wheel axle a is mounted in a fork, p, formed at the lower end of a lifting-lever, P, and to said axle are pivoted arms P^2, in the outer end of which is mounted the trailer or guide wheel B. Above the fork the lever P has a slot, P′, in which is mounted a friction-pulley, p', in frictional contact with the wheel F′ of the truck. The rotation of the pulley p' is transmitted to the cleaner-wheel by a pulley, p^2, on shaft of pulley p', said pulley p^2 being belted to a pulley, p^3, on the axle of the cleaner-wheel. The lever P is pivoted at p^4 in a bracket-arm, P^3, bolted to the under side of the truck-platform, for the purpose of lifting the cleaner-wheel clear of the track and moving the friction-pulley away from the truck-wheel. The cleaner-wheel may also be rotated by a pinion, q, mounted on the axle a thereof, and meshing with a gear-wheel, q', the shaft q^2 of which carries the driven pulley E, belted to the driving-pulley F on the truck-wheel axle f, as shown in Fig. 21. In this construction the trailer-wheels may be dispensed with or not, as desired. When such are employed, the shafts thereof are mounted in bars or girts pivoted to the cleaner-wheel axle, to carry the trailer-wheel either in front of the cleaner-wheels, as in Fig. 18, or behind the cleaner-wheels, as may be found most convenient. The shafts a q^2 of the wheel A and pulley E and wheel q' rotate in sliding bearings r, fitted in slots r', formed in curved brackets Q, bolted to the under side of the truck-platform. The slots r' describe arcs of a circle the center of which is that of the truck-wheel axle, and the bearing-blocks are held to their seats with a yielding pressure by means of springs S, thus enabling the cleaner-wheel to ride over obstructions without injury to the transmitting-gearing, the bearing-blocks r yielding to any pressure exerted on the wheel A. The shaft a of the wheel A and the shaft q^2 of gear-wheel q and pulley E extend from side to side of the machine, and are supported, as described, in slotted brackets Q. The two shafts are coupled centrally and connected by a link or links, g^3, to crank-arms k on a transverse bar, I, which in this case is located above the truck-platform, and to which bar the lifting-lever K is attached, so that both shafts are simultaneously lifted against the tension of the springs S without destroying the connection between the driving-gearing. As the bearing-slots r' are on segments of a circle the center of which is that of the truck-axle, any displacement of the shafts a q^2 in said slots will not affect the connection of the driving-pulleys E F, which will always remain at the same distance from each other, so that the belt or rope will always retain its proper tension.

Instead of pulleys E F and rope or belt, sprocket-wheels and chains may be employed, as will be readily understood.

If desired, the cleaner-wheels may be mounted in sliding bearing-blocks arranged inside of the frame C, so as to adapt said wheel to yield to obstructions, the blocks rising vertically in their seats, as shown in Fig. 22—a construction that is well known.

When the devices are connected with a truck or car, I prefer to drive the cleaner-wheels from one of the car-axles. It is obvious, however, that the devices can be employed

without connecting them to a car, in which case a suitable platform may be supported from uprights secured to the cleaner-wheel frames, such platform being of sufficient size to accommodate the driver and water-tank, and the apparatus may be drawn by horses. If the cleaner-wheels are rotated by manual power, suitable supports for the driving-pulley F, which in such case will be rotated by hand, will be provided on said platform—an arrangement that will be readily understood by any mechanic.

Having now described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a steel-wire brush, the combination, with a series of bunched and bound steel wires, of a tapering wedge forced centrally through said bunch of bound wires, and having its upper end bent over the bound end of the brush.

2. In a steel-wire brush, the combination, with a series of bunched and bound wires, of the wedge made tapering longitudinally, and of triangular form in cross-section, adapted to be forced centrally through the tied part of the wires and its projecting end bent over, as and for the purpose specified.

3. In a steel-wire brush, the combination, with a series of bunched and bound wires, of a wedge made tapering longitudinally, and terminating at its taper end in a loop or eye, as and for the purpose specified.

4. The wheel A, having an annular flange or boss, A^2, provided with a series of peripheral openings, and the brushes D, in combination with the pointed set-screws D′, substantially as and for the purpose specified.

5. The wheel A, having an annular flange, A^2, provided with a series of peripheral openings, and the brushes D, in combination with the pointed set-screws D′ and the check-nuts D^3, arranged for co-operation substantially as and for the purpose specified.

6. The wheel having a series of peripheral openings, and an annular flange, A^2, provided with like openings, the scrapers or cutters A′, and the brushes D, of the set-screws D′ and the check-nuts D^3, all arranged for co-operation on a grooved track or tramway, as described.

7. The combination, with the scraper and brush-wheel and the trailing or guide wheel, of a casing, L L′, constructed substantially as described, and adapted for vertical and lateral movement with the said wheel, as and for the purpose specified.

8. The combination, with the scraper and brush-wheel, of a casing composed of a semi-cylindrical portion, L, a deflector, and covering-plate L′, having foot-piece L^3 and slanting sides, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN REMFRY.

Witnesses:

GEORGE PROBY,

KHENDE COOMER DULL.