

(No Model.)

3 Sheets—Sheet 1.

W. HECKERT.

APPARATUS FOR CLEANING RAILWAY CONDUITS.

No. 447,181.

Patented Feb. 24, 1891.

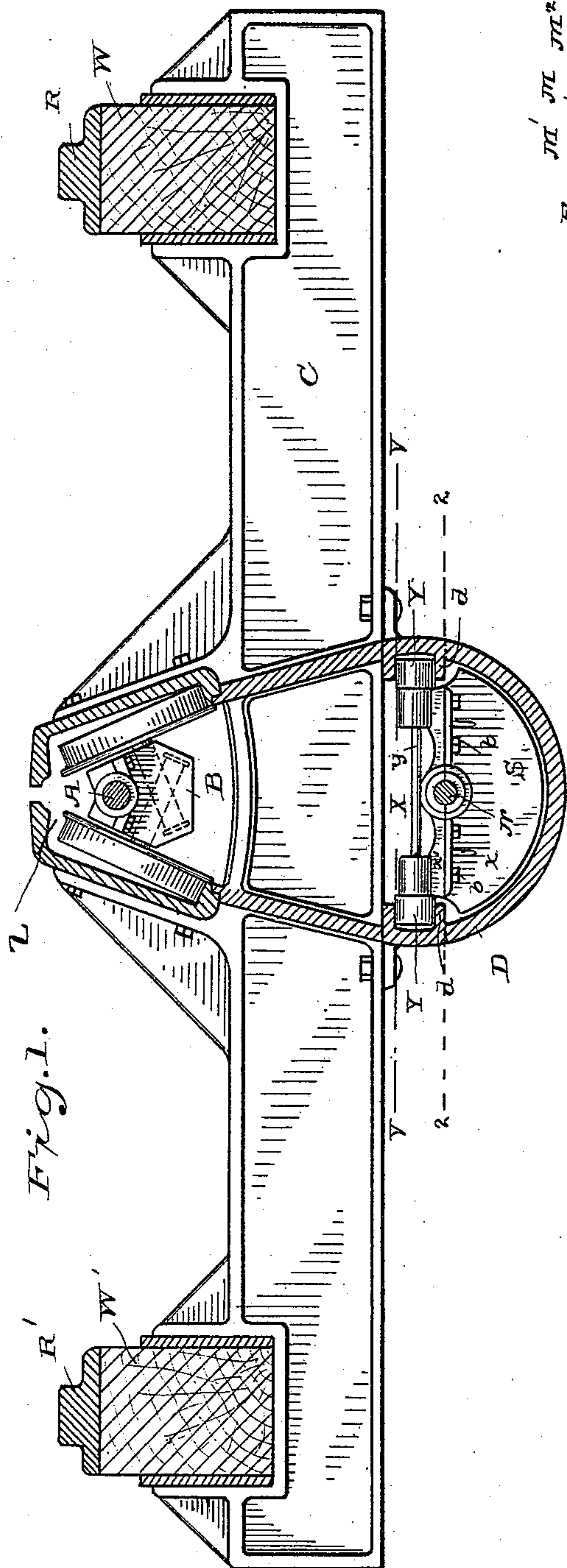


Fig. 1.

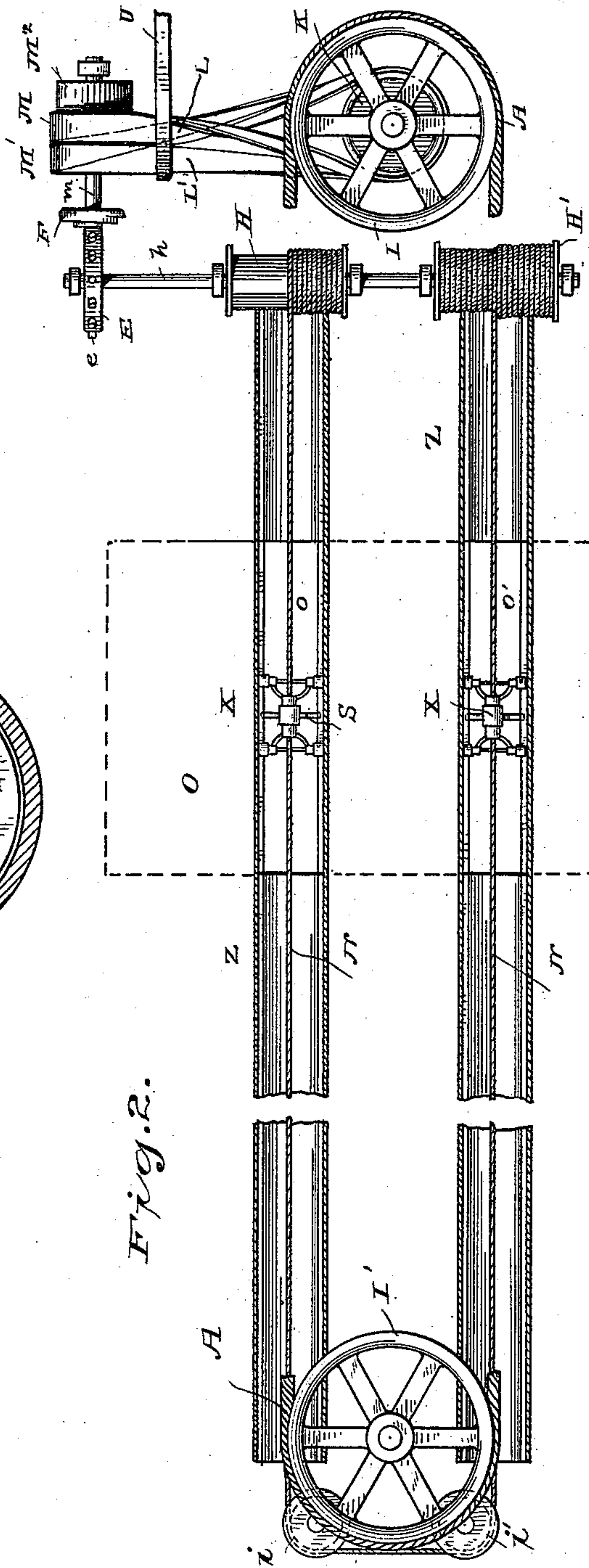


Fig. 2.

Witnesses

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Fig. 3.

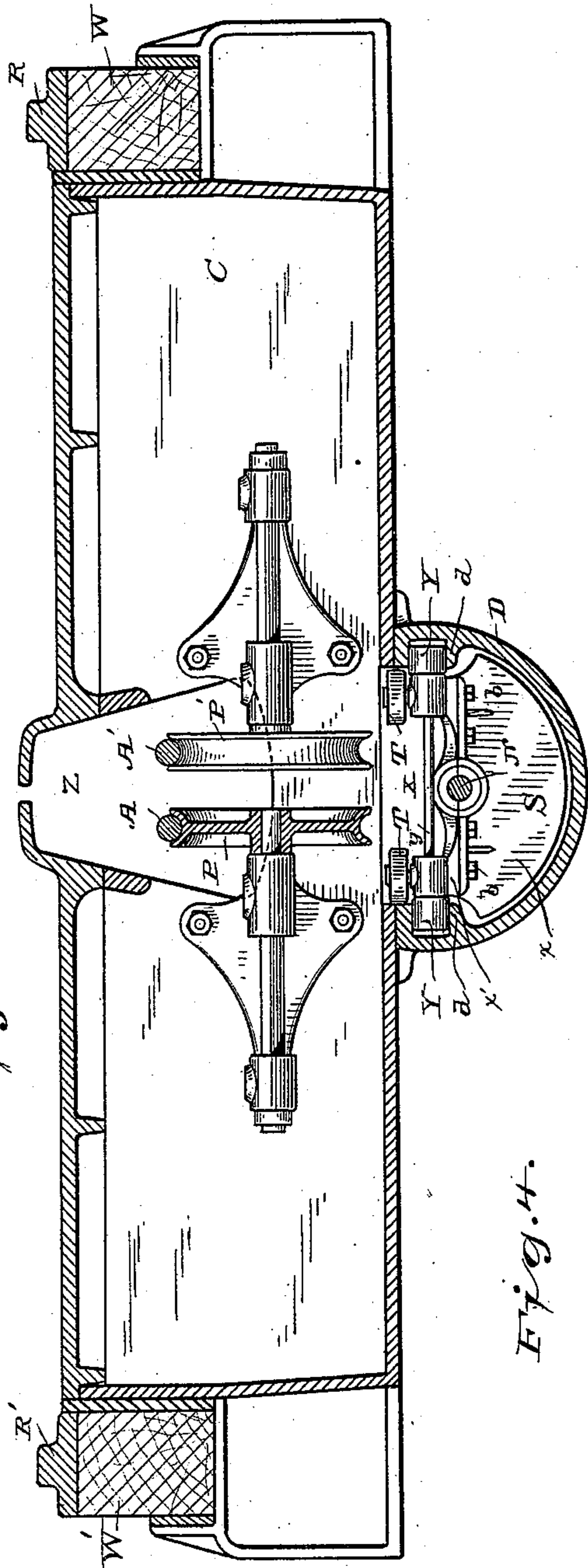
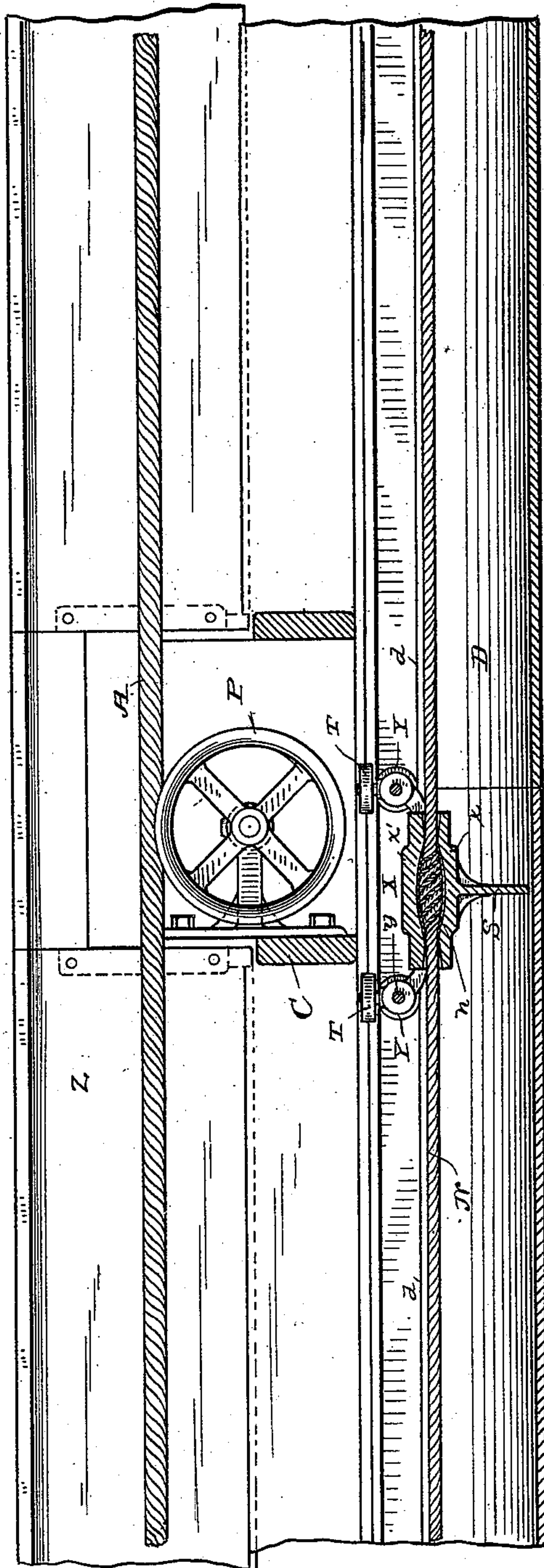


Fig. 4.



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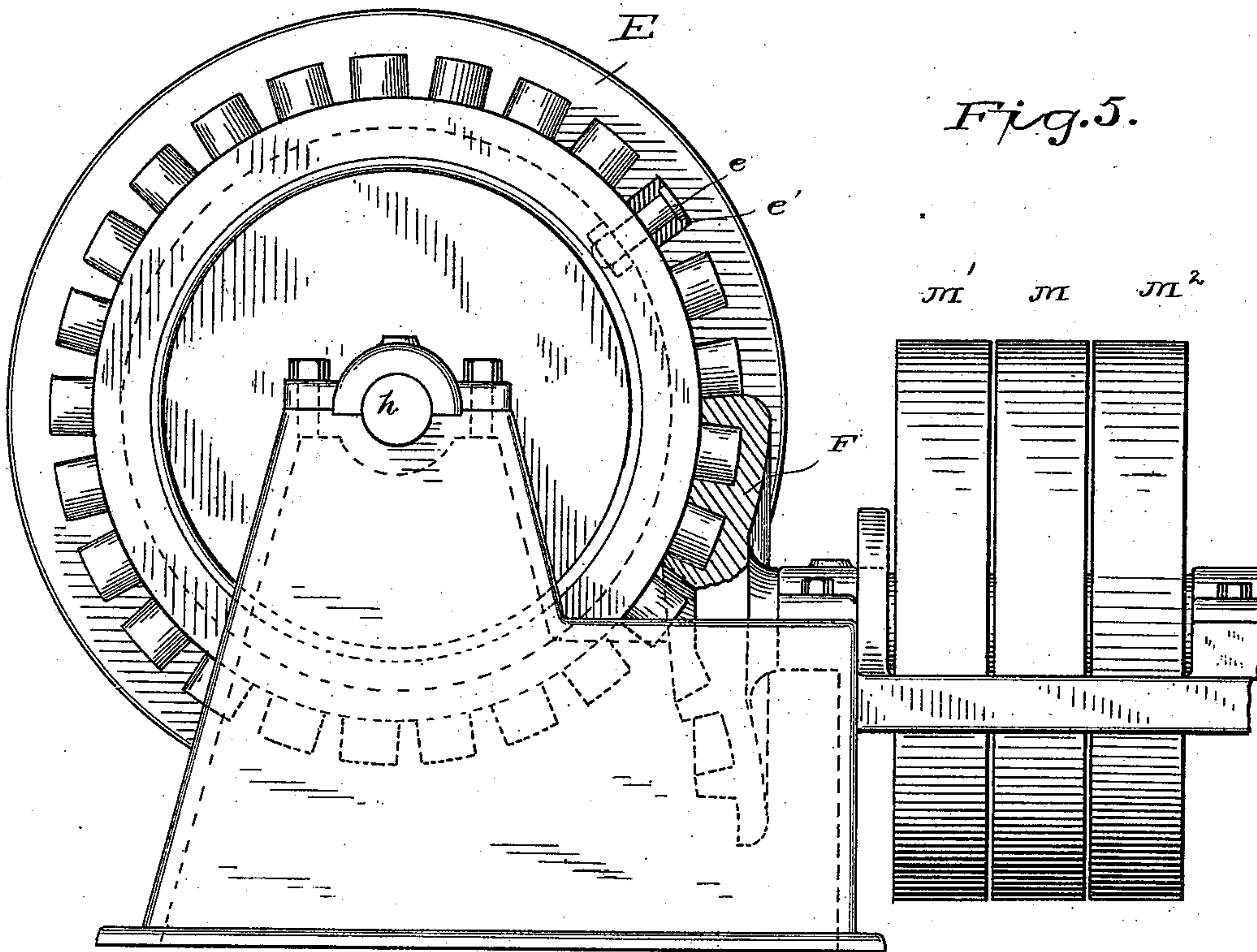
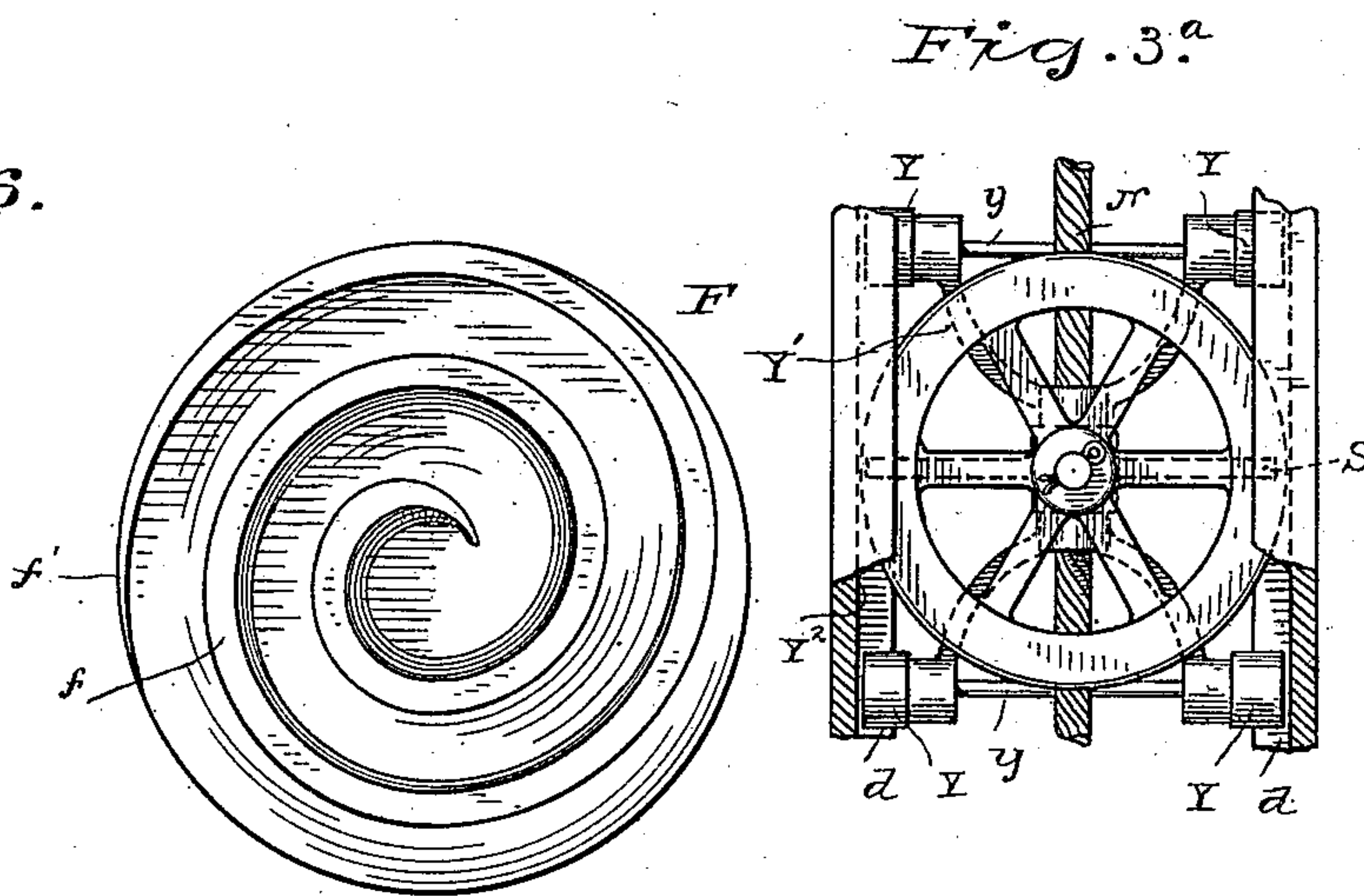


Fig. 5.



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APPARATUS FOR CLEANING RAILWAY-CONDUITS.

SPECIFICATION forming part of Letters Patent No. 447,181, dated February 24, 1891.

Application filed July 20, 1889. Renewed February 3, 1891. Serial No. 379,975. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HECKERT, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Apparatus for Cleaning Railway-Conduits; 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.

My invention consists in the hereinafter-to-be-described apparatus for cleaning railway-conduits.

In the drawings, Figure 1 represents a cross-section of a railway-conduit and one line of track with my invention applied thereto. Fig. 2 is a plan view of the lower half of a double track-railway conduit with my invention operating in the same. This view is taken on line *vv* of Fig. 1. Fig. 3 is a cross-section of another form of conduit with my invention applied thereto. Fig. 3^a is a modification. Fig. 4 is a longitudinal section of the conduit shown in Fig. 3. Fig. 5 shows in side view and partial section the preferred form of driving-gear. Fig. 6 is a front view of the driving-plate with spiral teeth, shown in section in Fig. 5.

One great difficulty in the operation of conduit electric roads and in cable railroads employing a shallow conduit or slotway—such, for instance, as are described in my patents, No. 318,620, granted May 26th, 1885, and No. 382,810, granted May 15, 1888—is the accumulation in the conduit of dirt and other foreign matter, which interferes with the smooth motion of the cable in cable railways and with a good electrical contact in electrical roads.

It is the object of my invention to provide a convenient and efficient means for the removal of such dirt, and I have illustrated it as applied to the two forms of cable railroad described in the two patents above referred to.

In Fig. 1 *Z* is a shallow conduit or slotway in which the traffic-cable *A* runs upon trucks *B*, all as described in my patent, No. 382,810. In the same way in Figs. 3 and 4 *Z* is the conduit and *A* the traffic-cable running upon the sheaves *P*. A supplementary cable *A'* is

shown running upon the sheaves *P'*. In both cases *C* is the cross-tie upon which the stringers *W W'* are supported, while on these latter rest the rails *R R'*.

The conduit *Z* has an extension at its lower side *D*, which thereby virtually forms the bottom of said conduit. Upon suitable rails *d d*, attached to the sides or bottom of this extension *D* of the conduit, there run suitable friction-rollers *Y Y*, mounted upon the axis *y*, set in the truck *X*. This truck *X* is composed of the lower portion *x* and the upper portion *x'*, which portions are fastened together by suitable screw-bolts *b b*. In these two portions *x x'* of the truck are grooves, which, when the two parts are placed together, come opposite one another and leave a circular opening for the cable *N*. This circular opening is larger at its middle portion, and the cable *N* is enlarged by the introduction of Babbitt metal or other suitable substance between its strands sufficiently to fill this portion of the cavity, which is of larger diameter, as set forth in my patent, No. 382,810. In consequence of this construction the truck *X* is attached to and moves with the cable *N*, which it serves to support.

The rollers *Y Y*, previously described, enable the trucks and the cable *N*, connecting the same, to run freely when the conduit is practically straight; but when the said conduit is curved to follow the curvature of the track the side draft of the cable *N* will force one of the rollers *Y* against the side of the conduit unless suitable provision for the prevention of such action is made. I accomplish this object by having additional horizontal rollers *T T* mounted on the upper part of the truck *X*, which said rollers will bear against the side of the conduit, as illustrated in Fig. 3. Attached to these trucks or to the lower portion *x* is a suitable scraper *S*, of such shape as to conform to the cross-section of the lower portion *D* of the conduit. It is evident, therefore, that as the cable *N* is drawn along in one direction or the other the scraper *S* will move with it, carrying before it any accumulated dirt or other foreign matter which may be found in the bottom of the conduit. As shown in Fig. 2, there is a large number of these trucks *X*, with their scrapers *S*, at-

tached to the cable N at suitable distances apart, and in the preferred arrangement, as illustrated in Fig. 2, the cable N passes around suitable guide-sheaves *i i'* at one end of the railroad, or at one end of a section of the railroad if the line is of such length that it is advisable to divide it up into sections, each of which sections shall have its special cleaning apparatus, and returns to the driving-windlass at the other end of the road. It would of course be possible to have a number of different forms of apparatus for driving this cable N, which is designed to move slowly; but I have illustrated only one form, which is shown in Fig. 2.

H H' are two windlasses or parts of the same windlass mounted on a shaft *h*. One end of the cable winds onto the portion H' of the windlass as the other end unwinds from the portion H of the said windlass. If, therefore, this windlass be given a revolving movement alternately in opposite directions, the trucks X and the scrapers attached to them will move back and forth through the conduit over distances determined by the extent of the revolution in any one direction given to the windlass H H'.

It is evident that various forms of driving-gear may be employed to produce this revolution of the drums H H'; but my preferred form is that illustrated in Figs. 2, 5 and 6, wherein E is a wheel or disk mounted on the shaft *h*, or it may be a portion of one of the drums H H'. Upon this piece E, which is rigidly connected with the drums, are mounted suitable radial projections *e*. A revolving disk F, which has spiral teeth *f f'* upon its face, is mounted on a shaft *m* and engages with the aforesaid projections *e*. As the disk F is rotated in one direction or the other the projections *e* will move toward or away from the center of the disk or plate and the part E and the shaft *h* will revolve in one direction or the other. In order to prevent friction and wear, I find it advisable to mount friction-rollers *e'* upon the radial projections *e*. These friction-rollers should be of a diameter nearly equal to the distance between any two teeth or portions of the radial tooth *f f'* on the disk F.

In the arrangement shown in Fig. 2 the shaft *m* is driven by the two belts L L', which run over the pulleys M' M'', keyed to the shaft *m*, or over the loose pulley M in the usual manner. The belt L' is crossed, and the two belts being controlled by the reversing-lever U the shaft *m* is revolved in one direction or the other, according to the position in which the lever U is placed. These belts are both driven from the pulley K, which is on the same shaft which drives the drum or pulley I, which gives motion to the traffic-cable A. This traffic-cable A, a large portion of which is broken away in Fig. 2 in order to show the slow-moving cable N, runs over the pulleys or drums I I'.

If the cable N moves continuously in one

direction and the section of road which it was to clean were not too long, all the dirt might be carried before the scrapers S and forced out of one end of the conduit. It might also be possible to give the cable N a reciprocating motion and still have the dirt delivered from the ends of the conduit, first from one end of the section and then from the other end of that section; but I find it preferable to have suitable pits, such as O, Fig. 2, placed under the trucks at suitable short distances—say five or six hundred feet—and to cut away the lower portion of the conduit-extension D, leaving openings *o o'*, through which the dirt accumulated by the scrapers during their travel from one pit to another may drop. These openings are formed by cutting away all the lower portion of the conduit below the dotted line 2 2, Fig. 1, over the pit. It is then necessary to give the slow-moving cable N a reciprocating motion just sufficient to or a little in excess of that necessary to carry any one scraper S from one pit to another.

The operation of my invention is evident from its description. The pits O are made large enough for men to get down into and shovel the accumulated dirt up to the surface or into a sewer-opening which may be provided for its removal. As the scrapers move slowly back and forth they carry before them and deposit in the pit whatever dirt may have fallen through the conduit-slot and whatever oil and particles of iron may drop from the cable or its running-gear. While I have shown my invention as applied to shallow-conduit cable roads of peculiar construction, it may be applied to any of the cable roads having deeper conduits now in use or to electric conduit roads. It may frequently happen that certain sections of the road between any two pits will be entirely straight, so that there will be no necessity of employing the additional horizontal pulleys T T upon the trucks which travel over these particular sections, and it is only necessary to add the said rollers to those trucks which travel over sections of the road which have curves.

The advantage of the particular driving-gear illustrated lies in the smoothness and evenness of its operation and cheapness of its construction, together with the great strength of the rubbing part. While I have described and illustrated special forms of apparatus for operating the slow-moving cable and the traction-cables, other well-known forms of mechanism could be applied without departing from the spirit of my invention, and I wish it understood that I do not confine myself to the particular form of driving-gear illustrated.

In the modification shown in Fig. 3^a the horizontal rollers T T are replaced by a single large horizontal wheel Y', which enters the groove Y'', in which the rollers Y run. By this construction the wheel Y' is not so likely to strike against any obstruction, such

as a bolt-head protruding through the bottom of a cross-tie, &c.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In combination with a conduit for railways, a slowly-reciprocating cable in the bottom of said conduit and scrapers attached to said cable, together with suitable driving-gear for imparting reciprocating motion to said cable, substantially as described.

2. In combination with a conduit for railways, a slowly-reciprocating cable in the bottom of said conduit, trucks provided with rollers which run upon rails attached to said conduit, and which trucks are attached to and support the said cable, together with scrapers attached to said truck, and driving-gear which imparts reciprocating motion to the cable and trucks, substantially as described.

3. In combination with a conduit for railways, a slow-moving cable in the bottom of said conduit, suitable trucks provided with rollers which run upon rails attached to said conduit, and which trucks are attached to and support the said cable, and additional horizontal rollers on said trucks, which bear against the sides of the conduit, together with suitable scrapers attached to said trucks and suitable driving-gear which imparts motion to the cable and trucks, substantially as described.

4. In combination with a conduit for railways, a slowly-reciprocating cable in the bottom of said conduit and scrapers attached to said cable, together with driving-gear for imparting reciprocating motion to said cable, and openings in the bottom of said conduit

placed at distances apart slightly less than the distance through which the cable reciprocates, through which openings the dirt collected by said scrapers may drop, substantially as described.

5. In combination with a conduit for railways, a slow-moving cable in the bottom of said conduit and suitable scrapers attached to said cable, together with guide-sheaves for said cable, placed at one end of a road or of a section thereof, a drum at the other end of the road or section, onto which one end of the cable winds as the other end unwinds, and suitable driving-gear for revolving said drum alternately in opposite directions, substantially as described.

6. In combination with a conduit for railways, a slow-moving cable in the bottom of said conduit and suitable scrapers attached to said cable, together with guide-sheaves for said cable, placed at one end of a road or of a section thereof, a drum at the other end of the road or section, onto which one end of the cable winds as the other unwinds, openings in the bottom of said conduit at suitable distances apart, and suitable driving-gear for revolving the drum alternately in opposite directions sufficiently to give the scrapers a reciprocating motion through a distance slightly in excess of the distance between any two openings, substantially as described.

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

WM. HECKERT.

Witnesses:

JAMES S. FITCH,
LAURA A. HECKERT.