Aug. 28, 1945. S. O. BLANC 2,383,843

MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

Filed June 13, 1942 8 Sheets-Sheet 1

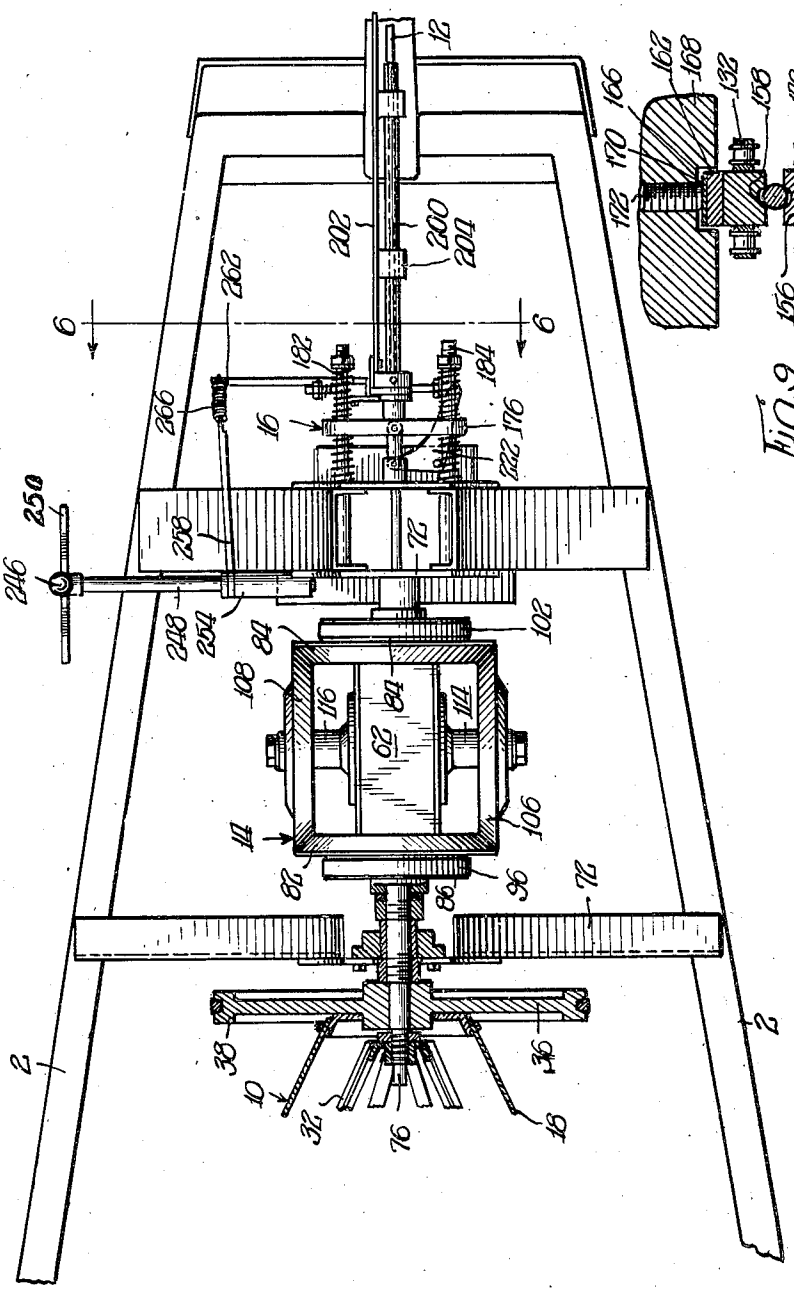


Fig. 1.

Fig. 9.

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MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

Filed June 13, 1942 8 Sheets-Sheet 2

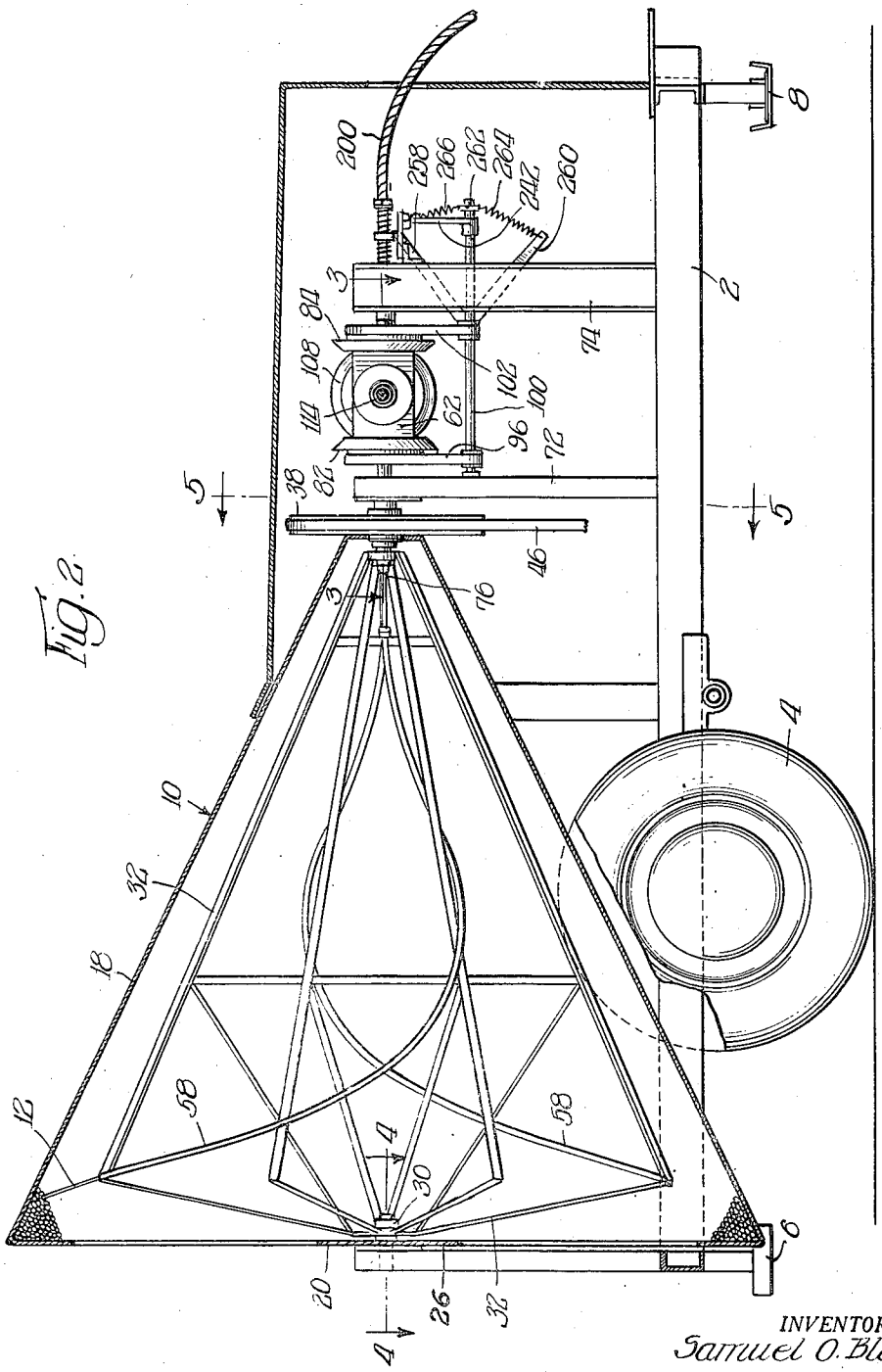


Fig. 2.

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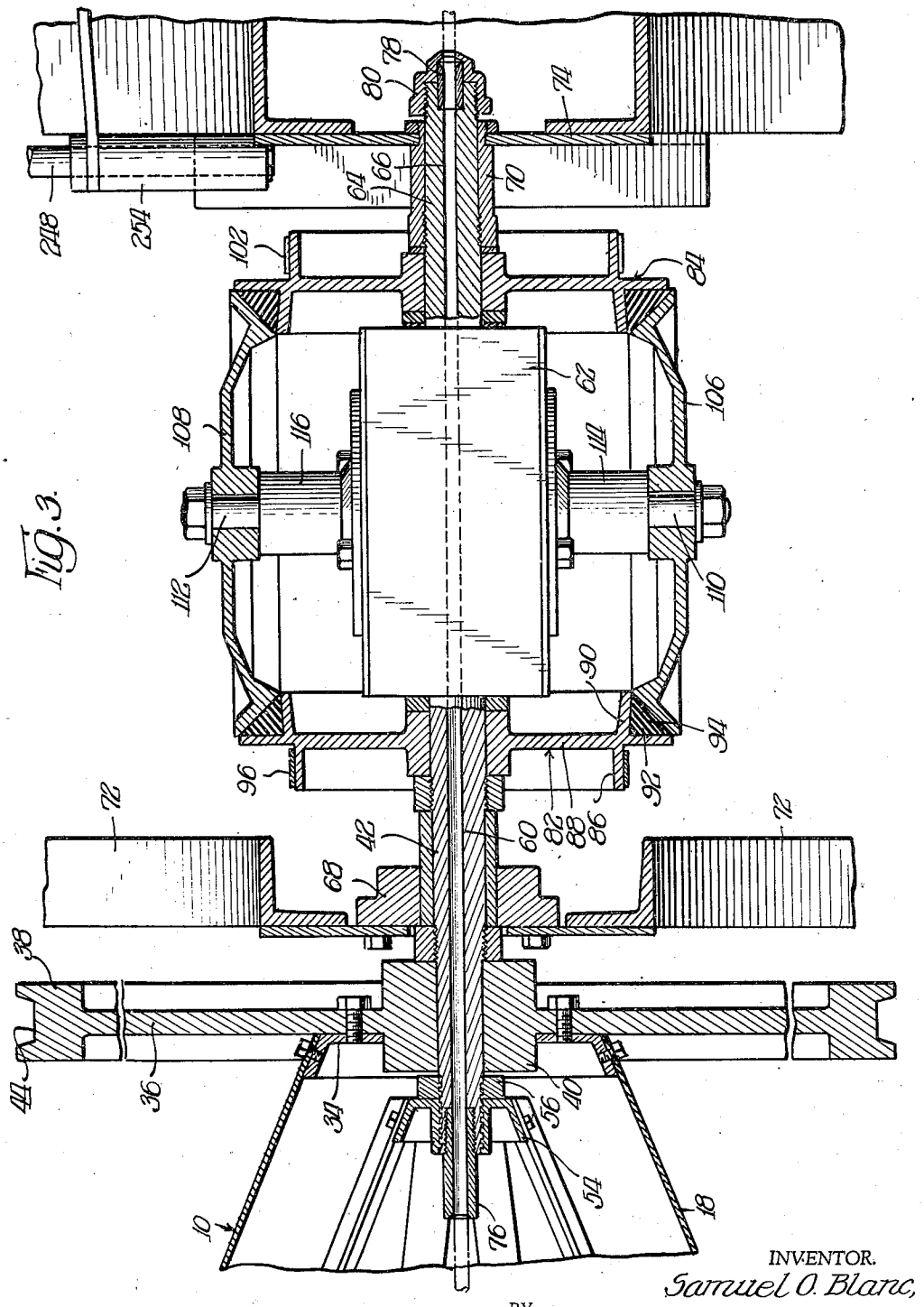


Fig. 3.

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MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

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Fig. 5

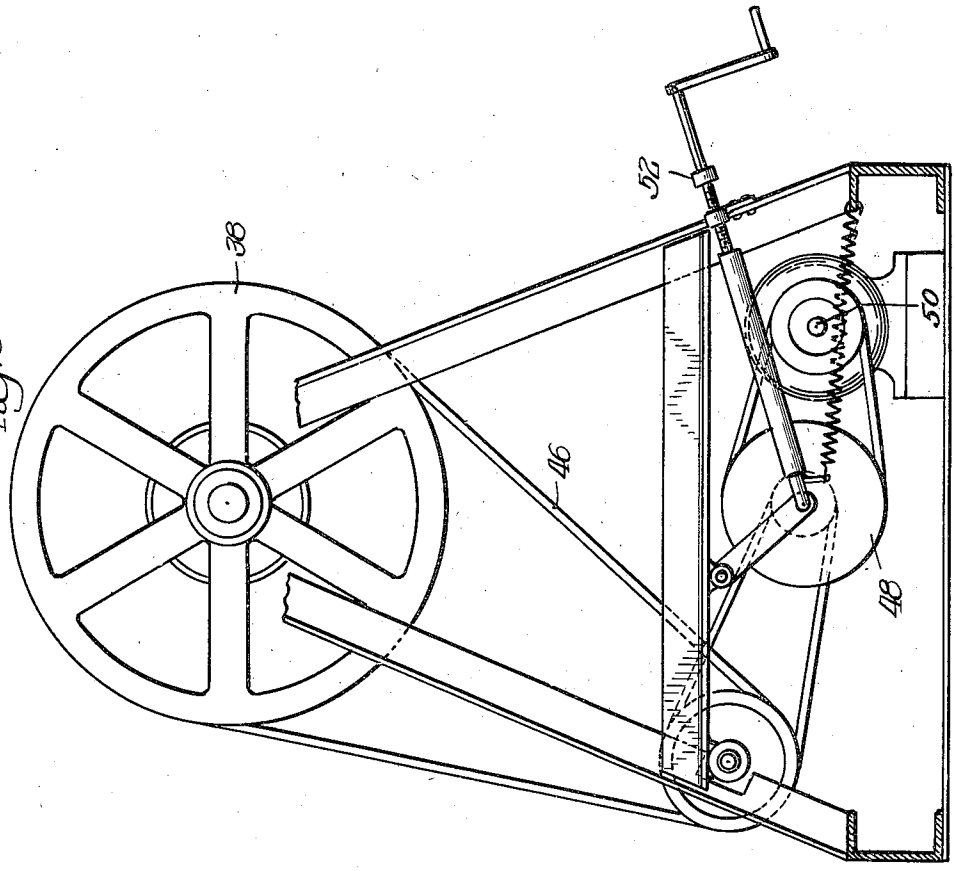
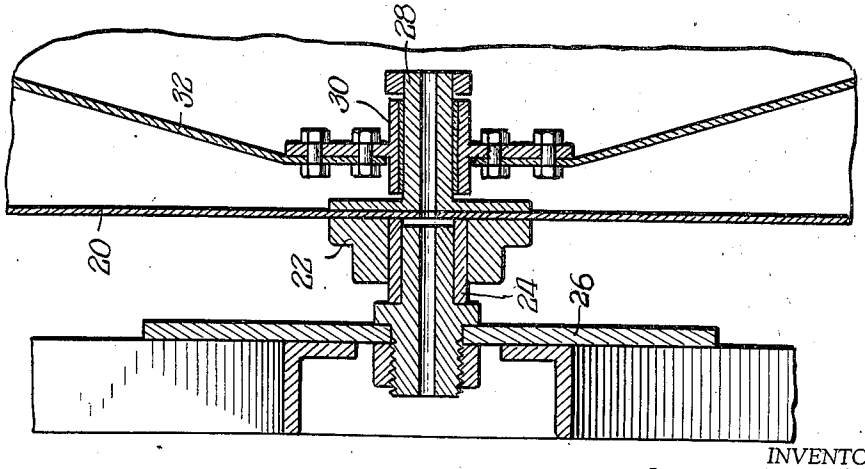


Fig. 4



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MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

Filed June 13, 1942 8 Sheets-Sheet 5

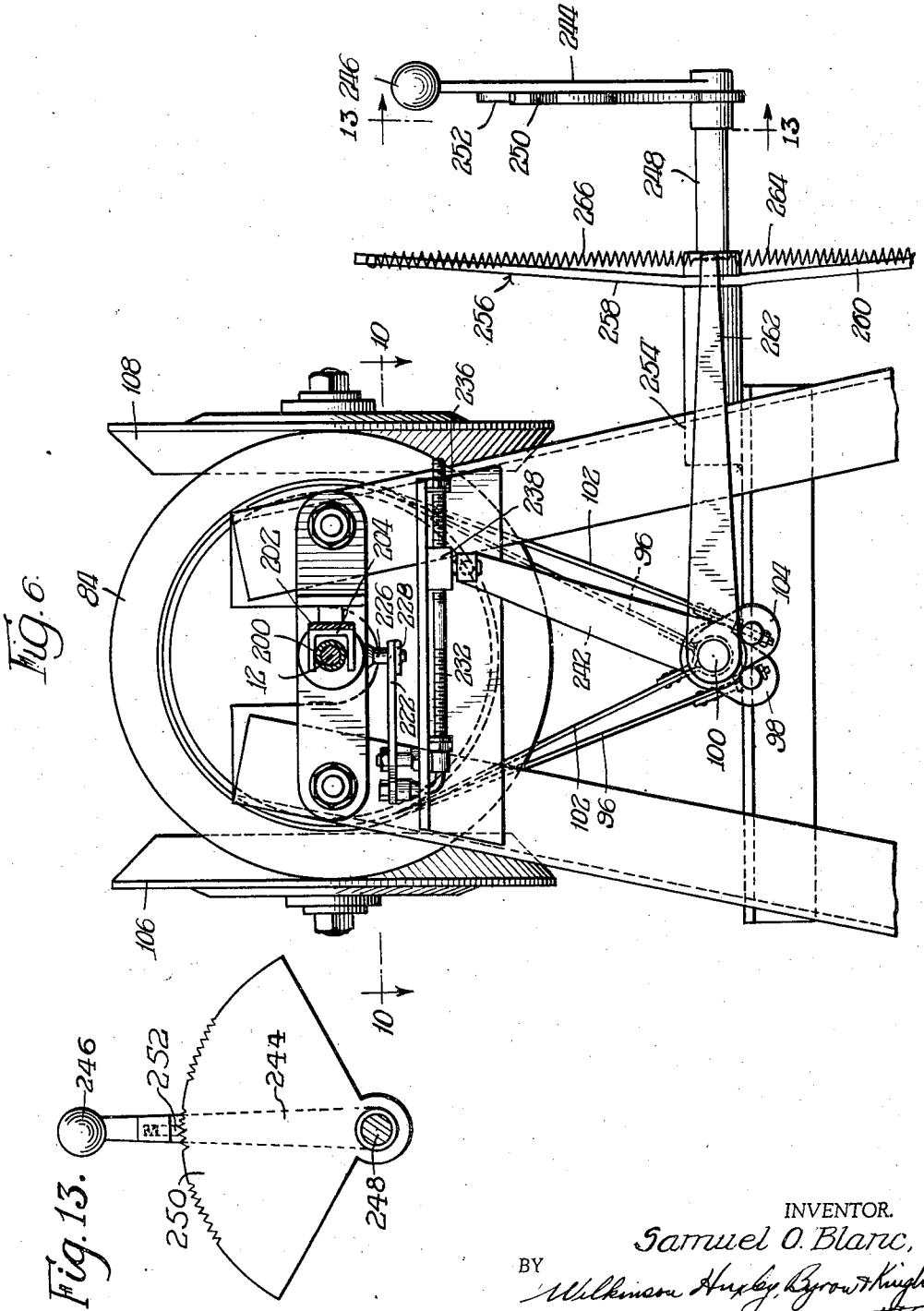


Fig. 6.

Fig. 13.

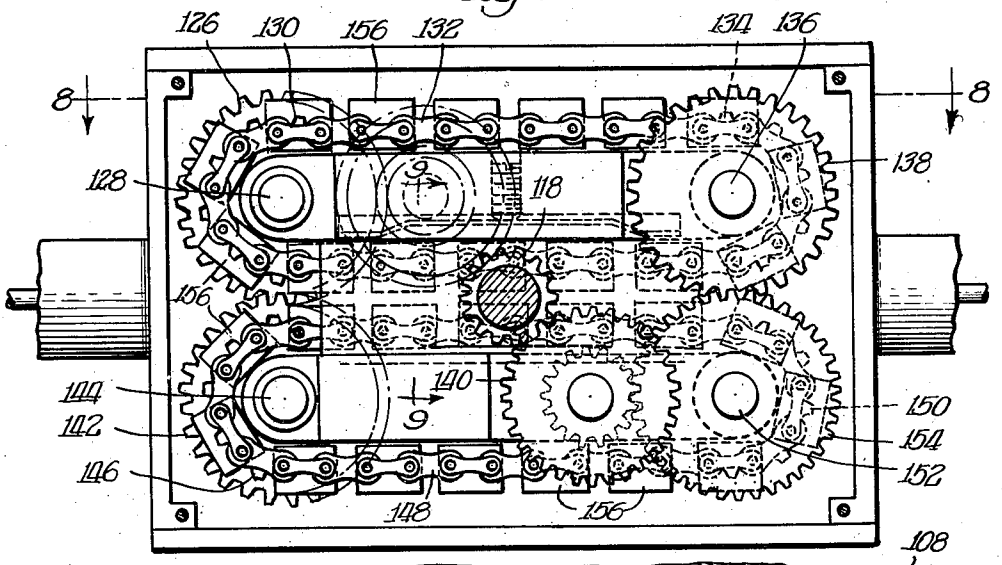
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Aug. 28, 1945. S. O. BLANC 2,383,843

MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

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Fig. 7.



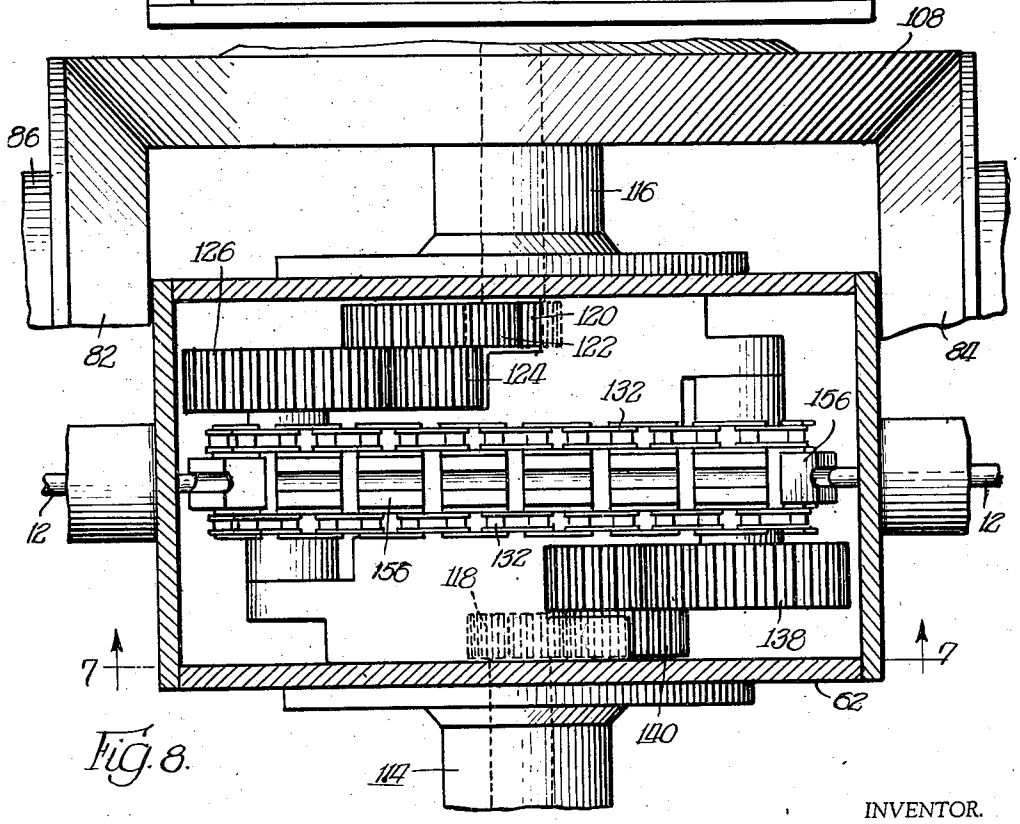


Fig. 8.

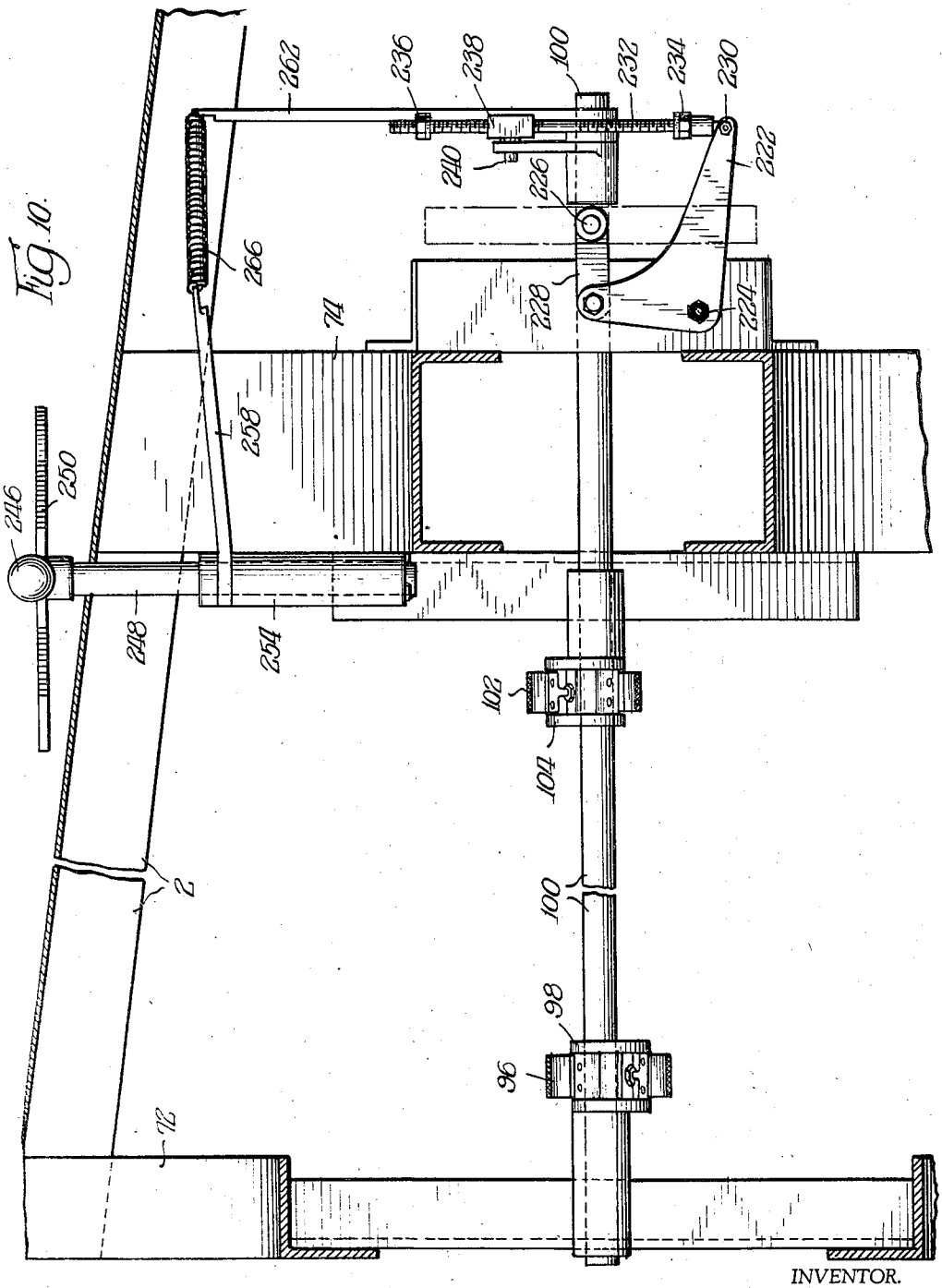
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MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

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Fig. 10.



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MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

Filed June 13, 1942 8 Sheets-Sheet 8

Fig. 11.

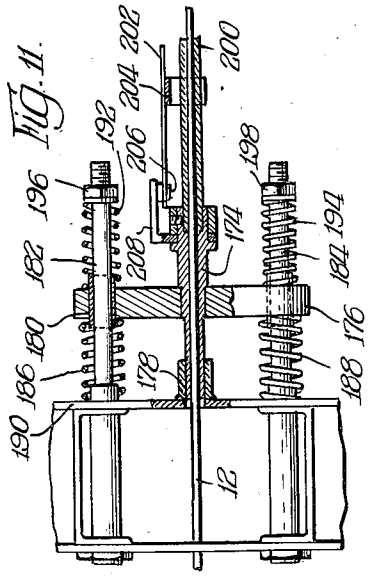


Fig. 12.

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Patented Aug. 28, 1945 2,383,843

UNITED STATES PATENT OFFICE

2,383,843

MECHANISM FOR RODDING AND CLEANING PIPES, SEWERS, AND THE LIKE

Samuel O. Blanc, Des Moines, Iowa

Application June 13, 1942, Serial No. 446,860

17 Claims. (Cl. 15—104.30)

The present invention relates to power operated mechanisms for cleaning sewers, drains, and the like, through the medium of a flexible rod having a cleaning or cutting element mounted at the end thereof, and which is adapted for insertion lengthwise into the drain or sewer pipe.

Among the objects of the present invention is to provide a novel device of the character described, which is simple in its construction, yet sturdy, making it particularly adapted for use over long periods of time.

The present invention has to do with devices of the general character as shown in Blanc Patents Nos. 2,111,527 and 2,282,600. Both of these prior art devices incorporate in their assembly a flexible shaft generally referred to as a "snake," consisting of a helically wound steel rod which is inserted lengthwise into the drain or sewer pipe and rotated, for effecting the loosening of material clogging the pipe or drain and removing the same therefrom. It has been recognized, however, that such machines have certain inherent objectionable characteristics both from the standpoint of the cost of the "snake," as well as the fact that when torsional strain is wound into the same the said flexible shaft is rather dangerous to handle under certain conditions, and the possibility of damage to the machine is ever present. For some period of time the desirability of using a rod as the flexible element for effecting the cleaning operation has been recognized, but until the present time no effective power transmitting and feeding means has ever been provided for effectively handling a smooth, polished rod of the type contemplated in the present invention.

Accordingly, one of the objects of the present invention is to provide a novel power operated mechanism for cleaning sewers, drains, and the like, embodying in its assembly a smooth, polished flexible rod for operating the cleaning and cutting mechanism at the end thereof when inserted lengthwise into the sewer, or drain, or water pipe.

More particularly, the invention has as an object, the provision of a power transmitting device adapted for paying out or retracting the smooth, polished flexible rod element and simultaneously putting the same under torsional stress whereby the cleaning or cutting element at the end thereof is given rotary movement for loosening, cutting and agitating the material within the sewer, or drain, or pipe.

Another object within the purview of the present invention is to provide a novel power transmitting means for a device of the type herein contemplated, which is so constructed as to provide for the operation of the flexible rod at variable speeds, such means effecting variable longitudinal as well as rotational movement of the said flexible rod.

Still another object within the purview of the present invention is to provide a novel power transmitting and feeding means embodying in its construction a novel arrangement of elements for effectively gripping a polished flexible rod to assure positive action for said rod when being paid out and retracted.

The present invention has as a further object the provision of novel means adapted to cooperate with the flexible rod to automatically control the feeding and retraction of the said rod. More particularly, such automatic feed control involves the use of means which in cooperation with the said flexible rod automatically controls the operation of the power transmitting and feeding means to prevent damage to the machine, which might otherwise occur where the said flexible rod meets with obstructions within a sewer, drain or the like.

As a further object of the present invention, the said automatic feed control mechanism is of such a construction and so arranged with respect to the flexible shaft, that the said shaft under normal conditions is permitted to operate under certain limits of stress placed therein by obstructions and the like in sewers, drains, and the like, but which control means operates automatically when such limits are reached to stop the operation of the machine, thus preventing damage thereto which might otherwise occur because of the over-stressing of said flexible shaft.

Other objects, features, capabilities and advantages are comprehended by the invention, as will later appear and as are inherently possessed thereby.

Referring to the drawings—

Figure 1 is a fragmentary view in plan of a sewer cleaning device or the like made in accordance with the present invention;

Figure 2 is a view, partly in elevation and partly in section, of the machine shown in Figure 1 of the drawings;

Figure 3 is an enlarged view in cross section of a part of the machine shown in Figure 1, and taken in the plane represented by line 3—3 of Figure 2 of the drawings;

Figure 4 is an enlarged fragmentary view in cross section of one end of the machine, and taken in the plane represented by line 4—4 of Figure 2;

Figure 5 is a view partly in elevation and partly

in section, taken in the plane represented by line 5—5 of Figure 2 of the drawings;

Figure 6 is a view in end elevation taken in the plane represented by line 6—6 of Figure 1 of the drawings;

Figure 7 is a cross sectional view of the power transmitting and feeding mechanism, taken in the plane represented by line 7—7 of Figure 8;

Figure 8 is a view partly in plan and partly in section of the power transmitting and feeding mechanism, and taken in a plane represented by line 8—8 of Figure 7 of the drawings;

Figure 9 is an enlarged fragmentary view taken in the plane represented by line 9—9 of Figure 7;

Figure 10 is a fragmentary view partly in plan and partly in section, taken in the plane represented by line 10—10 of Figure 6 of the drawings;

Figure 11 is a fragmentary view partly in plan and partly in section of the control mechanism at the forward end of the device; and

Figure 12 is a diagrammatic showing of the machine as the same would appear when set up for operation to remove obstructions from an underground sewer, drain, or the like.

Figure 13 is a detached view of part of the control mechanism for the device taken in the plane represented by the line 13—13 of Figure 6.

Referring now more in detail to the drawings, a cleaning device of the character herein contemplated may be mounted upon a frame, generally referred to as 2, supported through the medium of a plurality of wheels such as 4, whereby the same may be transported from place to place as required. The said frame is formed with shoes, such as 6 and 8, which are adapted to support the frame and the mechanism mounted thereon in operative position, as may be clearly seen in Figure 12 of the drawings, when the said wheels 4 are retracted. The device as disclosed in the embodiment shown in the drawings, comprises generally a storage means 10 for the flexible rod 12, a power transmitting and feeding mechanism 14, and an automatic feed control 16, all mounted upon the frame 2, as will be described more in detail hereinafter.

As shown in Figures 2 and 4 of the drawings, the storage means 10 is in the form of a cone-like housing 18 formed with a rear wall 20 and providing a chamber for the flexible rod 12 which is adapted to be coiled, as shown in the drawings, at the outer periphery of the cone element 18 adjacent the rear wall 20, it being understood that the end of the flexible rod 12 is connected to the cone in any desired manner. The housing is mounted at its rear end through the medium of the wall 20, which has an outer journal bearing 22 mounted upon the journal 24 fixed in any desired manner to the frame elements 26. Likewise secured to the end wall 20 is an inwardly disposed journal 28 which provides a support for a journal bearing 30 of the inner spider 32.

The forward end of the housing 18 is secured through the medium of the bracket 34 to the radial disc or web 36 of a pulley 38 loosely mounted through its hub 40 upon a hollow shaft 42, to which reference will be made hereinafter more in detail. The pulley 38 is formed with an outer peripheral groove 44 adapted to receive a belt 46 which is operated through a series of belts and pulleys, generally referred to as 48, which in turn are driven by a motor connected to the shaft 50. The series of pulleys and belts which effect driving relation between shaft 50 and belt 46 has associated therewith adjusting means, generally referred to as 52, for adjusting the driving relation of the said belts and pulleys to take up slack which may appear in the belts of said drive.

The spider 32, hereinbefore referred to generally, is of skeleton formation, as clearly shown in the drawings, and in addition to the loose journal mounting 30 at its rear end (Fig. 2), is fixedly connected through the nut 54 (Fig. 3) to the hollow sleeve or shaft 42 (Fig. 3) adjacent the hub 40 of the pulley 38, a lock nut 56 being provided therebetween to position said elements in respect to one another and to insure proper operative relation of the forward end of the spider in fixed relation to the sleeve or hollow shaft 42. The spider 32 conforms generally to the shape of the housing cone 18, and is further formed with a guide tube 58 leading from adjacent the coiled flexible rod within the housing 18 to a point on the axis of rotation of the spider, as well as the housing, for delivering said flexible rod lengthwise into the bore 60 of the sleeve or shaft 42.

The hollow shaft 42 constitutes in part the power transmitting and feeding means 14 (Fig. 1), and is connected, as by means of welding or the like, to a housing 62 in alignment with another hollow sleeve or shaft 64 extending in opposed relation to the housing 62, and having its bore or opening 66 in aligned relation to the bore 60 of the shaft 42. This housing which encloses certain elements of the power transmitting and feeding means, and which will be described more in detail hereinafter, is supported through the medium of the shafts 42 and 64 in the journal bearings 68 and 70 (Fig. 3), secured to the frame elements 72 and 74, respectively. The flexible rod 12 extends through the bore 60 of shaft 42, through the housing 62 and then through the bore 66 at the forward end of said housing 62.

Since the mechanism within the housing 62 operates in a lubricant, the retention of which is desired, the said shaft 42 at its rearward end is provided with a bushing 76 which closely embraces the flexible rod 12 and serves as a wiping element for said flexible rod when the said rod is being retracted within the housing 18, and which prevents the entrance of grit and dirt which may be on the flexible rod as the same is being paid out, as will be more fully appreciated hereinafter. The shaft 64 is further provided with a wiping bushing 78 disposed at its forward end and retained in position by a nut 80, and which serves in the same capacity as the bushing 76.

The power transmitting and feeding means 14 further includes the friction wheels 82 and 84 loosely mounted upon the shafts 42 and 64, respectively, adjacent the rear and front of the housing 62, and each of which is of similar construction, the same being provided with a drum 86 disposed laterally and to one side of the web 88, and further including a laterally disposed recess 90 for receiving an annular band of friction material 92, such as rubber or the like, having the inclined friction surface 94. The drum 86 of the friction wheel 82 is embraced by the brake band 96, which has its ends connected, as shown in Figure 10, to a cam element 98 mounted upon the longitudinally disposed shaft 100. The brake drum 86 of the friction wheel 84 is embraced by the brake band 102 and has its ends connected to a cam 104, likewise mounted upon the shaft 100, but dis-

posed in opposed relation to the cam 98 for a purpose to be hereinafter more fully disclosed.

Disposed in frictional cooperative relation with the friction material 92 of the friction wheels 82 and 84 are opposed drive wheels 106 and 108, splined to shafts 110 and 112, respectively, which are journaled in hubs 114 and 116 extending laterally of the housing 62, the shafts having mounted thereon pinion gears 118 and 120 (Fig. 8) disposed within the housing 62. The drive through wheels 106 and 108 for the mechanism within the housing 62 is the same in each instance, and reference accordingly will be made to one of said drives only. For example, the pinion 120 meshes with a gear 122 which has an integral pinion 124, which in turn meshes with and drives the gear 126. This gear is mounted upon a shaft 128 transversely disposed and mounted in the housing 62, and which has spaced sprocket wheels 130 mounted thereon. These sprocket wheels are engaged by sprocket chains 132 which engage sprocket wheels 134 in alignment with sprocket wheels 130 and which are mounted upon the shaft 136 arranged in parallel relation with the shaft 128 and suitably mounted within the housing 62. Mounted upon the shaft 136 is a gear 138 which, through the medium of the gear assembly 140 corresponding to the gear and pinion 122 and 124, is driven by the pinion 118. Meshing with the gear 126 is another gear 142 mounted upon a shaft 144, which is suitably journaled in the housing 62 and which carries sprocket wheels 146 interengaged by sprocket chains 148 which pass around and engage the sprocket wheels 150 mounted upon a transverse shaft 152 aligned with the shaft 136. Shaft 152 likewise carries a gear 154 which meshes with the gear 138.

The sprocket chains 132 and 148 are of similar construction and, as clearly shown in Figure 9 of the drawings, carry a plurality of blocks 156 therebetween. Each of the blocks has a longitudinal recess 158 in the surface thereof for engagement with the flexible rod 12 which extends therebetween. As shown in the drawings, the blocks 156 of the sprocket chains 148 ride over the shoes 160 in their longitudinal movement while in engagement with the flexible rod 12. The blocks 156 carried by the sprocket chains 132 likewise engage a shoe 162, but while the shoe 160 is fixed in the support 164, the shoe 162 is resiliently mounted in a recess 166 of the housing 168 though the medium of the spring 170 disposed in said recess 166. The shoes 160 and 162 are of a length to support a series of three of the blocks of each of the sprocket chains and through the medium of the spring 170 a gripping action is effected to feed or retract the flexible rod 12 and to grip the same to introduce torsional stress therein for rotating the free end thereof. Adjustment of the spring action is effected through the medium of the set screw 172.

The present invention involving the use of a highly polished flexible rod as an operating element, comprehends a novel formation for the blocks 156 whereby a gripping of this flexible rod can be effected. As clearly shown in Figure 9 of the drawings, the radius of curvature for the recesses 158 is less than the radius of curvature for the flexible rod, so that the rod is gripped by substantially line contact in opposed relation between the blocks of the sprocket chains to effecively transmit movement from the power transmitting and feeding means to the said rod. This engagement conforming to substantial line contact over relatively small areas is a highly important feature of construction in the present assembly when it is considered that the rod in passing through the power transmitting and feeding means 14 is covered with relatively heavy lubricant, which is essential not only in the operation of the mechanism within the housing 62, but is desirable to prevent rust and deterioration of the flexible rod.

Operation of the feeding of the flexible rod is quite apparent from the drawings, and consists in rotating, through the pulley 38, the cone housing 18 and the power transmitting and feeding means 14. Rotation of the housing 62 under normal conditions, with the brake bands 96 and 102 in loose relation with their cooperating brake drums, results in a rotation of the free end of the flexible rod 12 at the forward end of the machine. The rotation of control shaft 100 in either of two directions, however, effects longitudinal movement of the flexible shaft 12 either in a forward or rear direction. For example, assume shaft 100 is rotated in a direction to effect a tightening of the brake band 96 on the drum 86. This retards the rotation of the friction wheel 82 and causes rotation of the drive wheels 106 and 108 in respect thereto, in accordance with the rotation of the housing as a unit about its axis. This in turn causes rotation of the shafts 110 and 112 which, through the gearing as shown in Figures 7 and 8, causes movement of the sprocket chains together with the blocks carried thereby. The blocks successively engage the flexible rod and, in the illustration here given, would cause the flexible rod to be paid or fed out at the front end of the machine.

Longitudinal movement of the flexible rod 12 in the reverse direction is effected by rotation of shaft 100 to release the brake band 96 and to effect operative engagement of the brake band 102 with the brake drum of friction wheel 84. This would result in a reverse movement of the sprocket drive, resulting in retraction of the flexible rod into the housing, where the same would be stored in the manner indicated in the drawings. As will be clearly apparent, the frictional cooperation of the brake bands 96 and 102 with the drums of drive wheels 82 and 84 provide means whereby a variable feeding and retraction of the rod 12 is obtainable dependent entirely on the amount of pressure applied to said brake bands.

The present invention further contemplates suitable mechanism for automatically controlling the feeding and retraction of the flexible rod so as to prevent damage to the machine, which might otherwise occur in the event that the cleaning tool mounted at the end of the rod meets with an obstruction within the sewer, drain or the like. In connection with this feature of the invention, the said automatic control is likewise effective at certain limits as required by the particular flexible rod being used with the machine. As shown in Figures 11 and 12 of the drawings, the flexible rod 12 at the forward end of the machine passes through a sleeve 174 mounted in a feed control bar 176 and journaled in the bearing 178 of the frame 2, the said sleeve being in alignment with the bore 66 of the hollow shaft 64. The feed control bar 176 is suitably mounted through the bushings 180 upon the bolts 182 and 184, whereby the said feed control bar has sliding movement in respect to the said bolts. Disposed on one side of the feed control bar and in abutment therewith, and in surrounding relation to the bolts 182 and 184, are the coil springs

186 and 188, respectively, having abutment at their other ends with the frame element 190. Disposed on the other side of the feed control bar and in embracing relation to the bolts 182 and 184, are the coil springs 192 and 194 abutting the said feed control bar 176 and having abutting engagement in opposed relation thereto with the nuts 196 and 198 screw-threaded upon the bolts 182 and 184, respectively. Mounted at the end of the sleeve 174 is a flexible sheathing or covering 200 which may, if desired, be made in sections in order to accommodate sewers, drains, and the like, of varying depths from the surface of the ground, and for use under varying conditions, which sheathing embraces the flexible rod 12 and is supported by a flexible strap 202 having a plurality of brackets 204 spaced to support said sheathing 200. This strap 202 is pivoted as at 206 to the bracket 208, which is connected at the end of the sleeve 174.

As shown in Figure 12 of the drawings, the sheathing or covering 200 is in the form of an S-curve, provided at its end with a bracket 210 having a hook element 212 adapted to engage the top of the sewer, drain, or the like, all as clearly disclosed, as at 214, to retain said sheathing in position to deliver the flexible rod 12 into the end of the sewer, drain, or the like. In order to anchor the lower end of the sheathing 200, an anchor 216 is provided consisting of a tubular member 218, which is pivotally connected at one end to the bracket 210 and which telescopically receives an adjustable element 220 at its other end. When the sheathing is lowered into the manhole, the lower end thereof is held in position by means of the anchoring mechanism described. In actual practice the said anchor may be adjusted to the desired length and the end of the sheathing 200 dropped into the manhole in such position that the hook 212 engages one side of the manhole and the anchoring element the other side to secure the supporting mechanism for the said sheathing in fixed position.

In the event obstructions are encountered within the sewer or drain pipe by the cleaning element at the free end of the flexible rod 12, such obstruction, with continued forward movement of the rod, causes the rod to act upon the sheathing 200, which in turn, through the medium of the feed control bar 176, acts against the coil springs 192 and 194. Where obstructions are encountered upon longitudinal movement of the flexible rod 12 in the opposite direction, the rod tends to move the sheathing 200, which in turn tends to compress the coil springs 186 and 188. The coil springs are selected as to capacity so as to accommodate the particular flexible rod being used, and in the present illustration the springs 192 and 194 are of 200 pounds capacity while the springs 186 and 188 are of 600 pounds capacity, the rod illustrated in the present invention being slightly greater than one-fourth of an inch.

In connection with the mechanism disclosed in Figures 11 and 12, further means is provided for automatically controlling longitudinal movement of the flexible rod 12 where obstructions are encountered, and the sheathing 200 through the feed control bar, compresses the springs abutting the same. Such mechanism is disclosed in Figures 6 and 10, and comprises a bell crank lever 222 pivoted to the frame as at 224 and to the feed control bar as at 226 through the link 228, the said bell crank being connected as at 230 to the transversely arranged control element 232 having the adjustable nuts 234 and 236 on either side of a carriage 238. The carriage 238, slidable on bar 232, is pivotally connected as at 240 to the lever arm 242 fixed to the shaft 100. As previously described, the shaft 100 has mounted thereon the cam elements 98 and 104, and accordingly the said cams are operated through the medium of the lever arm 242 whenever either of the nuts 234 or 236 contact the carriage 238. This occurs upon compression of the springs associated with the feed control bar, as hereinbefore described, and accordingly the feed control bar 176 operates to control the cams 98 and 104. Movement of these cams affects the feeding mechanism 14, as previously described, so that when an obstruction is met which causes compression of the springs associated with the feed control bar 176 to such an extent that said springs are compressed to their predetermined limit, then the feeding is automatically stopped by the mechanism described.

The automatic control immediately above described, is used in conjunction with a manual control which is used for controlling the mechanism 14. Such manual control comprises a lever 244 having an operating knob 246 fixed to the end of a shaft 248 and disposed adjacent a sector 250 which is provided with notches adapted to be engaged by a plunger or pawl 252 attached to the control handle 244. In initiating operation of the machine, the handle may be manipulated to secure the desired movement of the flexible rod, after which the same is held in place by the pawl 252 engaging in a notch on the sector 250. The operating shaft 248 is mounted as at 254 in the frame of the machine, and is provided with the bell crank lever 256, one arm 258 of which extends above the shaft, and the other arm 260 of which extends below the shaft. Connected to the shaft 100 is lever arm 262 extending outwardly toward the handle 244, and to which are connected coil springs 264 and 266, the former of which has its outer end connected to the end of arm 260 and the latter of which has its outer end connected to the arm 258. It will therefore be seen that a flexible operating connection is effected between the handle 244 and the shaft 100 by virtue of the springs 264 and 266. The capacity of these springs is sufficient to maintain the lever 262 in proper position for operating either of the cams 98 or 104, but are not of such a capacity that the positioning of either of the cams 98 or 104 is maintained when the lever 242 is operated by the control mechanism. Accordingly, when obstructions are encountered, the automatic control mechanism operates to stop the longitudinal feeding of the flexible rod irrespective of what the setting of the manual control may have been in the first instance.

In accordance with the present invention, longitudinal movement of the flexible shaft into and out of the sewer, drain or the like, is readily and conveniently effected, and at the same time the same is rotated to assist the cleaning element in removing accumulations of dirt or other material and for cutting roots and the like which may have clogged the drain or sewer. It is to be noted that the flexible rod is subject to storing of torsional energy by virtue of the fact that the same is effectively gripped by the blocks of the power transmitting and feeding mechanism, and that, accordingly, such storing of torsional energy facilitates the removal of the material within the sewer or drain and cutting of roots which may be present therein.

While I have herein described and upon the drawings shown an illustrative embodiment of the invention, it is to be understood that the invention is not limited thereto but may comprehend other constructions, arrangements of parts, details and features without departing from the spirit of the invention.

What is claimed is:

1. In a power operated mechanism for cleaning sewers and the like, the combination of a power transmitting and feeding mechanism comprising a single solid flexible rod adapted to be introduced into the sewer and the like and for transmitting torsional energy to a cleaning device attached to the end thereof, means for imparting longitudinal movement to said rod, means for rotating said rod about its longitudinal axis, said before mentioned means comprising gripping means including opposed gripping blocks provided with longitudinal grooves for receiving said rod, said grooves having their marginal edges spaced apart a distance less than the diameter of said rod, said edges being adapted to grip said rod in opposed substantial line contact.

2. In a power operated mechanism for cleaning sewers and the like, the combination of a power transmitting and feeding mechanism comprising a single solid flexible substantially round rod adapted to be introduced into the sewer and the like and for transmitting torsional energy to a cleaning device attached to the end thereof, means for imparting longitudinal movement to said rod, means for rotating said rod about its longitudinal axis, said before mentioned means comprising gripping means including opposed gripping blocks provided with longitudinal grooves for receiving said rod, said grooves being circular in formation with a radius of curvature less than the radius of curvature of said rod whereby the same is gripped between said blocks in opposed substantially line contact.

3. In a power operated mechanism for cleaning sewers and the like, the combination of a power transmitting and feeding mechanism comprising a single solid flexible substantially round rod adapted to be introduced into the sewer and the like and for transmitting torsional energy to a cleaning device attached to the end thereof, means for imparting longitudinal movement to said rod while rotating about its longitudinal axis, said means comprising a lubricant containing housing, opposed longitudinally travelling chains disposed in said housing, rod gripping blocks carried by said chains and having longitudinally disposed grooves for receiving said rod, said means including opposed shoes for guiding said blocks, means for flexibly mounting at least one of said shoes whereby said shoes are maintained in gripping relation to said rod, and said grooves being of circular formation with a radius of curvature less than the radius of curvature of said rod whereby the same is gripped between said blocks in opposed substantially line contact.

4. In a device of the character described, the combination of a single solid flexible rod for transmitting torsional energy, a source of power, storage means for said flexible rod driven by said source of power, rotatably mounted guide means having means of crank-like formation for receiving said stored flexible rod and delivering the same at the axis of rotation of said guide means, means driven by said guide means and adapted to receive said flexible rod for imparting longitudinal movement to said rod while rotating about its longitudinal axis, said means including a rotating housing having aligned hollow shafts for said rod, said means further including longitudinally movable gripping members disposed within said housing and in gripping relation to said rod, said means further including a selective friction control means between said source of power and said gripping members for selectively moving said rod at varying speeds.

5. In a device of the character described, the combination of a flexible rod for transmitting torsional energy having a cleaning implement attached to the working end thereof, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, and means responsive to the operating conditions of said cleaning implement when in a sewer or the like for automatically controlling the operation of said power transmitting and feeding mechanism.

6. In a device of the character described, the combination of a flexible rod for transmitting torsional energy having a cleaning implement attached to the working end thereof, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, guide means at the forward end of said device for said rod, said guide means being responsive to operating conditions of said cleaning implement when in a sewer or the like, and means actuated by said guide means for automatically controlling the operation of said power transmitting and feeding mechanism.

7. In a device of the character described, the combination of a flexible rod for transmitting torsional energy, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, flexible guide means adapted to cooperate with said rod, said guide means being adapted to be positioned adjacent one end thereof in operative relation to a pipe or the like for directing said rod lengthwise into and out of the same, said guide means extending in curved formation to said device, means adjacent the other end of said guide means for movably mounting the same relative to said device, and means responsive to the movably mounted guide means for automatically controlling the operation of said power transmitting and feeding mechanism.

8. In a device of the character described, the combination of a flexible rod for transmitting torsional energy having a cleaning implement attached to the working end thereof, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, giude means at the forward end of said device for said rod, said guide means being responsive to operating conditions of said cleaning implement when in a sewer or the like, means for manually controlling operation of said power transmitting and feeding mechanism, and means actuated by said guide means for automatically controlling the operation of said power transmitting and feeding mechanism.

9. In a device of the character described, the combination of a flexible rod for transmitting torsional energy having a cleaning implement attached to the working end thereof, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while ro-

tating about its longitudinal axis, operating means therefor, guide means at the forward end of said device for said rod, said guide means being responsive to operating conditions of said cleaning implement when in a sewer or the like, means for manually controlling operation of said power transmitting and feeding mechanism, and means operatively associated with said rod and said manual control and actuated by said guide means for automatically controlling the operation of said power transmitting and feeding mechanism through the said manual control means.

10. In a device of the character described, the combination of a flexible rod for transmitting torsional energy, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, means for manually controlling operation of said power transmitting and feeding mechanism, flexible guide means adapted to cooperate with said rod, said guide means being adapted to be positioned adjacent one end thereof in operative relation to a pipe or the like for directing said rod lengthwise into and out of the same, said guide means extending in curved formation to said device, means adjacent the other end of said guide means for movably mounting the same relative to said device, and means responsive to the movably mounted end of said guide means and operatively associated therewith and with said manual control for automatically controlling the operation of said power transmitting and feeding mechanism through the said manual control means under certain conditions of operation of said rod.

11. In a device of the character described, the combination of a flexible rod for transmitting torsional energy, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, means for manually controlling operation of said power transmitting and feeding mechanism, flexible guide means adapted to cooperate with said rod, said guide means being adapted to be positioned adjacent one end thereof in operative relation to a pipe or the like for directing said rod lengthwise into and out of the same, said guide means extending in curved formation to said device, means adjacent the other end of said guide means for movably mounting the same relative to said device, and means responsive to the movably mounted end of said guide means and operatively associated therewith and with said manual control for automatically controlling the operation of said power transmitting and feeding mechanism through the said manual control means, said last-named means including means providing a yieldable connection with said manual control means under certain conditions of operation of said rod.

12. In a device of the character described, the combination of a flexible rod for transmitting torsional energy, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, means for controlling operation of said power transmitting and feeding mechanism including cam means and a manual control therefor, flexible guide means adapted to cooperate with said rod, said guide means being adapted to be positioned adjacent one end thereof in operative relation to a pipe or the like for directing said rod lengthwise into and out of the same, said guide means extending in curved formation to said device, means adjacent the other end of said guide means for movably mounting the same relative to said device, and means responsive to the movably mounted end of said guide means and operatively associated therewith and with said cam means for automatically controlling the operation of said power transmitting and feeding mechanism under certain conditions of operation of said rod.

13. In a device of the character described, the combination of a flexible rod for transmitting torsional energy, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, means for controlling operation of said power transmitting and feeding mechanism including cam means and a manual control therefor, means providing a flexible connection between said cam means and said manual control, flexible guide means adapted to cooperate with said rod, said guide means being adapted to be positioned adjacent one end thereof in operative relation to a pipe or the like for directing said rod lengthwise into and out of the same, said guide means extending in curved formation to said device, means adjacent the other end of said guide means for movably mounting the same relative to said device, and means responsive to the movably mounted end of said guide means and operatively associated therewith and with said cam means for automatically controlling the operation of said power transmitting and feeding mechanism under certain conditions of operation of said rod.

14. In a device of the character described, the combination of a flexible rod for transmitting torsional energy, a power transmitting and feeding mechanism for imparting longitudinal movement to said rod while rotating about its longitudinal axis, operating means therefor, flexible guide means adapted to cooperate with said rod, said guide means being adapted to be positioned adjacent one end thereof in operative relation to a pipe or the like for directing said rod lengthwise into and out of the same, said guide means extending in curved formation to said device, means adjacent the other end of said guide means for movably mounting the same relative to said device, said movable mounting including resilient means of predetermined capacity for resisting movement of said flexible guide means in one direction and resilient means of a different capacity for resisting movement of said flexible guide means in another direction, and means responsive to said movably mounted guide means for automatically controlling the operation of said power transmitting and feeding mechanism.

15. In a device of the character described, the combination of a flexible shaft for transmitting torsional energy, a source of power, means for imparting longitudinal movement to said shaft while rotating about its longitudinal axis, said means including a rotatably mounted housing having substantially aligned hollow shafts for receiving said shaft, longitudinally movable gripping members disposed within said housing and in gripping relation to said shaft, said means further including opposed friction wheels associated with said housing and mounted for rotation substantially on the axis of rotation of said housing, opposed drive wheels associated with said housing and mounted for rotation on an axis substantially normal to the axis of rotation of said housing and having frictional cooperative rela-

tion with said friction wheels, said drive wheels having a driving connecton with said gripping members, and means for locking said friction wheels against rotation to effect a driving of said drive wheels upon rotation of said housing.

16. In a device of the character described, the combination of a flexible shaft for transmitting torsional energy, a source of power, means for imparting longitudinal movement to said shaft while rotating about its longitudinal axis, said means including a rotatably mounted housing having substantially aligned hollow shafts for receiving said shaft, longitudinally movable gripping members disposed within said housing and in gripping relation to said shaft, said means further including opposed friction wheels associated with said housing and mounted for relative rotation therewith substantially on the axis of rotation thereof, opposed drive wheels associated with said housing and mounted for rotation on an axis substantially normal to the axis of rotation of said housing and having frictional cooperative relation with said friction wheels, said drive wheels having a driving connection with said gripping members, and means for controlling said relative rotation of said opposed friction wheels with respect to said housing.

17. In a device of the character described, the combination of a flexible shaft for transmitting torsional energy, a source of power, means for imparting longitudinal movement to said shaft while rotating about its longitudinal axis, said means including a rotatably mounted housing having substantially aligned hollow shafts for receiving said shaft, longitudinally movable gripping members disposed within said housing and in gripping relation to said shaft, said means further including opposed friction wheels associated with said housing and mounted for relative rotation therewith substantially on the axis of rotation thereof, opposed drive wheels associated with said housing and mounted for rotation on an axis substantially normal to the axis of rotation of said housing and having frictional cooperative relation with said friction wheels, said drive wheels having a driving connection with said gripping members, said opposed friction wheels having friction drums, and means including drum engaging elements for controlling said relative rotation of said opposed friction wheels with respect to said housing.

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