G. N. CRAGIN.

PIPE CLEANER.

APPLICATION FILED DEC. 10, 1906.

949,622. Patented Feb. 15, 1910.

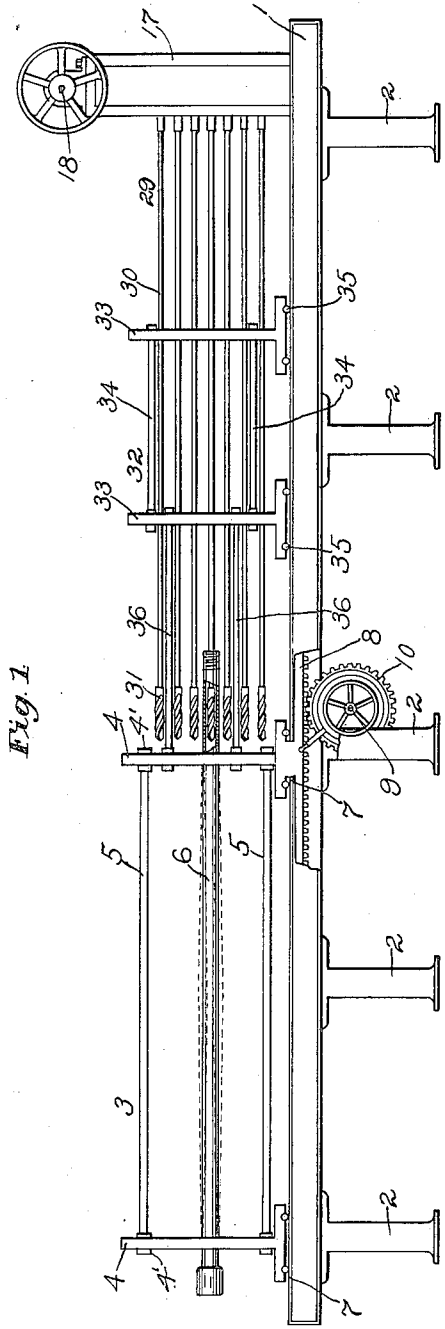

Fig. 1

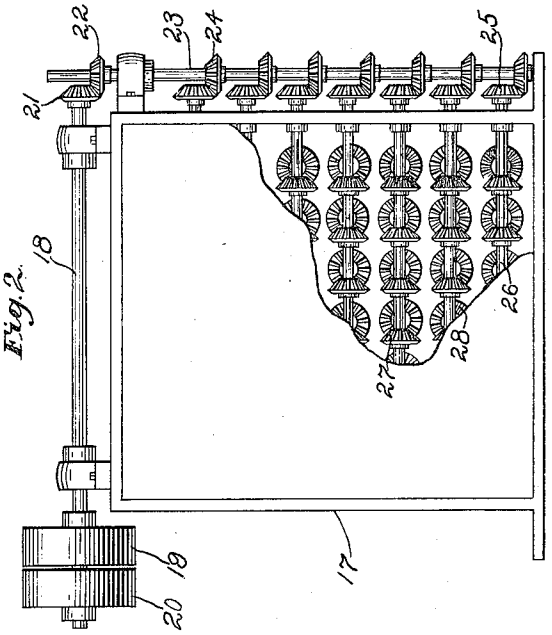

Fig. 2.

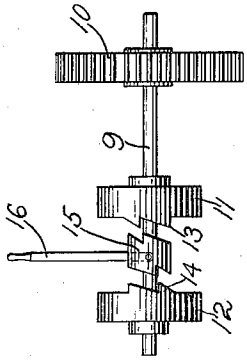

Fig. 3.

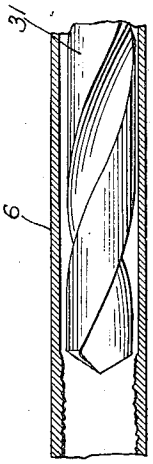

Fig. 4.

Witnesses:
Archie B. Colbath.
Irving U. Townsend

Inventor:
George N. Cragin
By Emery and Booth Attys.

UNITED STATES PATENT OFFICE.

GEORGE N. CRAGIN, OF KENMORE, NEW YORK, ASSIGNOR TO CLIFTON MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

PIPE-CLEANER.

949,622. Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed December 10, 1906. Serial No. 347,146.

To all whom it may concern:

Be it known that I, GEORGE N. CRAGIN, a citizen of the United States, residing at Kenmore, in the county of Erie, State of New York, have invented an Improvement in Pipe-Cleaners, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to apparatus for the removal of scale, lumps or other foreign substances from the interior of tubing, such as iron or steel tubing, the invention, however, being of general application and susceptible of use in many relations.

In order that the principles of the invention may be clearly understood, I have herein set forth a single type or embodiment thereof in the accompanying drawing, wherein,—

Figure 1 is a side elevation, partly in section, of one form of pipe cleaning mechanism embodying my invention; Fig. 2 is a rear elevation partly broken away, of the gearing for operating the pipe cleaning mechanism; Fig. 3 is a side elevation of one form of operating mechanism for the carriage; and, Fig. 4 is a longitudinal sectional view representing a pipe in the process of treatment in accordance with my invention.

Having reference to that single type or embodiment of the invention herein shown, the horizontal base or support for the mechanism embodying my invention is represented at 1, and, as shown, preferably receives all the operating parts together with the pipes to be operated upon, being itself mounted upon suitable uprights, 2.

Mounted upon the base 1, and preferably for longitudinal movement thereon is a carriage 3, herein shown as having suitable uprights 4, and horizontal tie rods 5, uniting the uprights to form a suitable rack or support wherein any desired number of pipes or similar articles 6, may be supported, one pipe being shown in the present instance. It is to be understood, however, that the end uprights 4—4, have formed therein or are otherwise provided with suitable supports 4′ for any desired number of pipes which may be mounted or supported therein in any desired manner, preferably so as to be readily removable therefrom the pipes being either tightly held in the carriage or mounted therein, so as to have a certain amount of vibration or movement during the cleaning operation.

As herein shown the uprights 4 are provided with rollers or ball bearings 7, by means of which the carriage may be readily longitudinally moved upon the support 1. While any desired means may be employed longitudinally to move the carriage, in the present instance there is represented a rack 8, suitably connected to the under portion of said uprights 4, or, if desired, the forward one thereof, in any suitable manner. Suitably mounted in said framing beneath said rack is a horizontally disposed shaft 9, having mounted thereon a gear 10, meshing with the rack 8 and in the present embodiment of the invention a clutch, herein shown as comprising opposed members 11 and 12, fast upon said shaft and provided with oppositely disposed ratchet teeth 13 and 14, with either set of which may engage the loose clutch member 15, mounted upon the shaft 9, between said members 11 and 12 and adapted to be slid into engagement with either clutch member 11 or 12 and to receive a movement of rotation in any suitable manner, as by a handle 16, thereby by hand to rotate the shaft 9 in either desired direction to move the pipe carriage 3 longitudinally upon the support 1. It is apparent that any suitable means may be employed to rotate the gear 10 in opposite directions to reciprocate the carriage.

Mounted upon the support 1 and preferably near one end thereof is an upright or housing 17, herein shown as having mounted upon the upper portion thereof in suitable bearings a shaft 18, carrying (Fig. 2) fast and loose pulleys 19 and 20, to which power may be applied from any suitable source and from which it may be conveyed to pipe cleaning rods or drills, and in the present instance by means of a beveled gear 21 upon the shaft 18, meshing with a similar gear 22, upon a vertically disposed shaft 23, having thereon a series of beveled gears 24, meshing with similar gears 25, upon horizontally disposed shafts 26, mounted in the upright or housing 17 and having thereon beveled gears 27, meshing with beveled gears 28, carried by or mounted upon the ends of pipe cleaning rods or drills 29, herein shown as horizontally disposed and arranged in

parallelism, any preferred number thereof being employed.

It is apparent that any suitable gearing may be employed to impart the desired rotative movement to said rods or drills, and said rods or drills may all be rotated at the same rate of speed, or in any suitable manner certain of said rods may be rotated at speeds differing from the remainder thereof, as by the provision of different sized beveled or other gearing, so that if desired during a single operation pipes of different diameter and requiring different numbers of revolutions per minute may be operated. Thus, during a single operation the entire series of rods or drills may be rotated in unison at the same speed or different portions or sets of said rods may be rotated at different speeds, preferably depending upon the diameter of the pipe to be operated upon. In the present instance the rods or drills are shown as rotating in unison and substantially at equal speeds.

In the present embodiment of the invention each drill or rod 29, comprises an elongated, slender, flexible and vibrant rod or body member 30 and drill head 31, the latter being of less diameter than the pipe that is to be operated upon, as clearly indicated in Fig. 4, wherein that portion of the pipe containing the drill head is represented as having the scale removed therefrom.

When the mechanism is in operation, and hence when the drill heads 31, are not inclosed within the pipes 6, the rods 30 are supported as shown in Fig. 1, at substantially middle length thereof, by a guide frame 32, herein shown as comprising end uprights 33, united by horizontal tie rods 34, which, in the present embodiment of the invention, are rigidly connected to the left-hand upright 33 and telescopically with the right-hand upright 33, said uprights preferably having enlarged bases receiving thereon balls or rolls 35, affording easy movement of said guide frame upon the base 1. It is apparent that the guide frame may comprise a single upright 33, but in practice I find that double or telescoping frames afford a firm support. In the present embodiment of the invention horizontally disposed rods 36 are rigidly connected to the forward upright member 4 of the carriage and are telescopically received within the left-hand upright 33.

It will be observed from the described construction that when the drill rods 31 are first inserted within the pipe 6 and are received by the ends thereof, the rods 30 are supported by both uprights 33 of the guide frame 32 substantially mid-length of said rods, so that but little vibration of said rods or drills 29 results. As the pipe carriage 3 is fed toward the right (viewing Fig. 1) by the rotation of the gear 10, the rods 36 projecting forwardly from said carriage telescope, or project beyond said left-hand upright 33, which remains stationary until the base of said carriage 3 engages the base of said end upright 33, when said carriage and base move forwardly in unison, at which time the rods 34, rigidly mounted in said left-hand guide frame 33, telescope or project in a similar manner through the right-hand upright 33, which remains stationary until it in its turn is engaged by the base of the left-hand upright, when the carriage and both uprights move in unison through the remainder of the forward travel of the carriage. When the motion of the carriage is reversed the carriage is moved to the left, leaving the end uprights 33—33 stationary, until the right-hand ends of the rods 36 are drawn into engagement with the left-hand upright 33, whereupon said upright moves to the left and in its turn draws after it the right-hand upright 33, when the right-hand end of the rods 34 engage therewith.

As the pipe carriage 3 is moved toward the right (viewing Fig. 1), a gradually increasing length of rod is presented to or supported by the left-hand guide frame and hence in the rotation of said rods a rapid and effective vibration thereof ensues, the drill heads 31 thus striking every portion of the interior of the pipe a repeated number of sharp blows, thereby removing all scale or other foreign substances effectively at a rate far exceeding that accomplished by any mechanism with which I am familiar. In the operation of the apparatus not only are the drill heads of the pipe cleaning members vibrated but the pipes themselves may be vibrated as indicated in dotted lines in Fig. 1, the pipe preferably vibrating to a less extent than the heads of the cleaning members, so that the said heads strike repeated blows upon each part of the said pipe or pipes.

Compressed air or water has been used either alone or in conjunction with sand, emery or carborundum, but thereby previously loosened scale merely was carried through and practically no impression was made upon scale or lumps not already loosened. By my invention I am enabled quickly and readily to remove all foreign substances from the interior of the pipe, the continuous advance of the drill heads 31 through the pipes and the continuous series of blows to which each portion of the interior of the pipes is subjected by the drill heads thoroughly loosening and removing all foreign matter. As the scales etc. are loosened by the repeated blows the material is delivered forward by the threaded portion of the drill heads and discharged at the ends of the tubes.

Having thus described one type or embodiment of the invention I desire it to be

understood that although specific terms are employed, they are used in a generic sense and for purposes of description merely, and not as terms of limitation, the scope of the invention being set forth in the following claims.

I claim—

1. A pipe cleaner comprising a pipe support, means for imparting longitudinal movement thereto, and a pipe cleaning member of elongated flexible vibrant rod-like formation of less diameter than the interior of the pipe to be cleaned, and means for supporting and rotating said member whereby the interior of the pipe to be cleaned may be subjected to a series of blows.

2. A pipe cleaner comprising a pipe supporting carriage, means for imparting longitudinal movement thereto and a plurality of pipe cleaning members of elongated flexible rod-like formation having enlarged heads of less diameter than the interior of the pipes to be cleaned, means for supporting said members at a distance from said pipes to present a vibrant portion of said members to said pipes, and means for rotating said members.

3. A pipe cleaner comprising a pipe supporting carriage having provisions for sustaining a plurality of pipes to be cleaned, means for imparting longitudinal movement to said carriage, a plurality of cleaning members of elongated flexible vibrant rod-like formation having enlarged screw heads of materially less diameter than the interior of the pipes to be cleaned, provisions for supporting said members at a distance from said carriage whereby during such rotation the interior of said pipes is subjected to a series of cleaning blows.

4. A pipe cleaner comprising a pipe support, means for longitudinally moving the same, an elongated, flexible, vibrant pipe cleaning member, means to support the same at the end thereof distant from said pipe support and an intermediate support for said pipe cleaning member, and means to rotate said member.

5. A pipe cleaner comprising a pipe support, means to impart longitudinal movement thereto, an elongated, flexible, vibrant pipe cleaning member having means to support the same at the end thereof distant from said pipe support and an intermediate support for said member connected to said pipe support and longitudinally movable therewith, and means to rotate said member.

6. A pipe cleaner comprising a pipe supporting carriage having provisions for receiving a plurality of pipes to be cleaned, means for imparting longitudinal movement to said carriage, a plurality of pipe cleaning members of elongated flexible vibrant rod-like formation, means to support said members at the end thereof distant from said pipe carriage and an intermediate support for said members connected to and longitudinally movable with said pipe carriage, and means for rotating said members.

7. A pipe cleaner comprising a base, a pipe supporting carriage of elongated formation mounted thereon and having provisions for sustaining a plurality of pipes therein, means for imparting longitudinal movement to said carriage, an upright also mounted upon said base, a plurality of pipe cleaning members mounted therein of elongated flexible vibrant rod-like formation and having enlarged screw threaded heads of materially less diameter than the pipes to be cleaned, means for rotating said members and an intermediate support for said members.

8. A pipe cleaner comprising a base, a pipe supporting carriage of elongated formation mounted thereon and having provisions for sustaining a plurality of pipes therein, means for imparting longitudinal movement to said carriage, an upright also mounted upon said base, a plurality of pipe cleaning members mounted therein of elongated flexible vibrant rod-like formation and having enlarged screw threaded heads of materially less diameter than the pipes to be cleaned, means for rotating said members and an intermediate support for said members connected to said carriage and longitudinally movable therewith.

9. A pipe cleaner comprising an elongated support, a pipe supporting carriage mounted thereon and having provisions for sustaining a plurality of pipes therein, a rack and gear for imparting longitudinal movement to said carriage, an upright mounted on said base, a plurality of pipe cleaning members mounted therein, means for rotating the same and a support and intermediate support for said members between said upright and said carriage and connected to the latter for longitudinal movement therewith.

10. A pipe cleaner comprising a base, a pipe supporting carriage mounted thereon and having provisions for supporting a plurality of pipes, means for imparting longitudinal movement thereto, an upright mounted upon said base, a plurality of pipe cleaning members mounted therein, means for rotating said members and an intermediate support for said members between said upright and said carriage connected to the latter for longitudinal movement therewith.

11. A pipe cleaner comprising a base, a pipe supporting carriage mounted thereon with provisions for sustaining a plurality of pipes, means for imparting longitudinal movement to said carriage, an upright supported upon said base, a plurality of pipe cleaning members mounted therein, gearing for rotating said cleaning members at the

desired speed and an intermediate pipe cleaning member supported between said upright and said carriage and connected to the latter for longitudinal movement therewith.

12. A pipe cleaner comprising a base, a pipe supporting carriage mounted thereon with provisions for sustaining a plurality of pipes, means for imparting longitudinal movement to said carriage, an upright supported upon said base, a plurality of pipe cleaning members mounted therein, gearing for rotating said cleaning members at the desired speed and an intermediate elongated support comprising connected uprights and rods connecting the same to said carriage whereby said intermediate support may be longitudinally moved therewith, and means for rotating said pipe cleaning members.

13. A pipe cleaner comprising a pipe supporting carriage having provisions for sustaining a plurality of pipes therein, means for imparting longitudinal movement to said carriage and upright, a plurality of pipe cleaning members mounted therein of elongated flexible vibrant rod-like formation having screw threaded heads of materially less diameter than the interior of the pipes to be cleaned and an intermediate elongated support for said members connected to said carriage for longitudinal movement therewith and gearing for rotating said members at the desired speed.

14. A pipe cleaner comprising a pipe supporting carriage, means longitudinally to move the same, a cleaning member of elongated flexible vibrant rod-like formation, means for supporting the same adjacent one end thereof, means for rotating the same and an intermediate support telescopically connected to said carriage.

15. A pipe cleaner comprising a pipe support, means for longitudinally moving the same, a pipe cleaning member, means to support the same at the end thereof distant from said pipe support, means to rotate said member and a plurality of intermediate supports for said pipe cleaning member telescopically connected to each other and one of them being telescopically connected to said pipe support.

16. A pipe cleaner comprising a pipe support, means for longitudinally moving the same, a pipe cleaning member, means to support the same at the end thereof distant from said pipe support, means to rotate said member, and a plurality of upright intermediate supports for said member, rods fixedly secured to one of said upright supports and telescopically received within the other intermediate upright, and rods fixedly secured to said pipe support and telescopically received within the adjacent intermediate upright support.

17. A pipe cleaner comprising an elongated pipe supporting carriage, means for longitudinally moving the same, a plurality of pipe cleaning members of elongated flexible vibrant rod-like formation having enlarged screw heads of slightly less diameter than the interior of the pipes to be cleaned and means to support the same at the end thereof distant from said pipe carriage, means to rotate said members, and a plurality of upright intermediate supports for said members, rods fixedly secured to one of said upright supports and telescopically received within the other intermediate upright and rods fixedly secured to said pipe support and telescopically received within the adjacent intermediate upright support.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGE N. CRAGIN.

Witnesses:
IRVING U. TOWNSEND,
ANNIE E. CHESLEY.