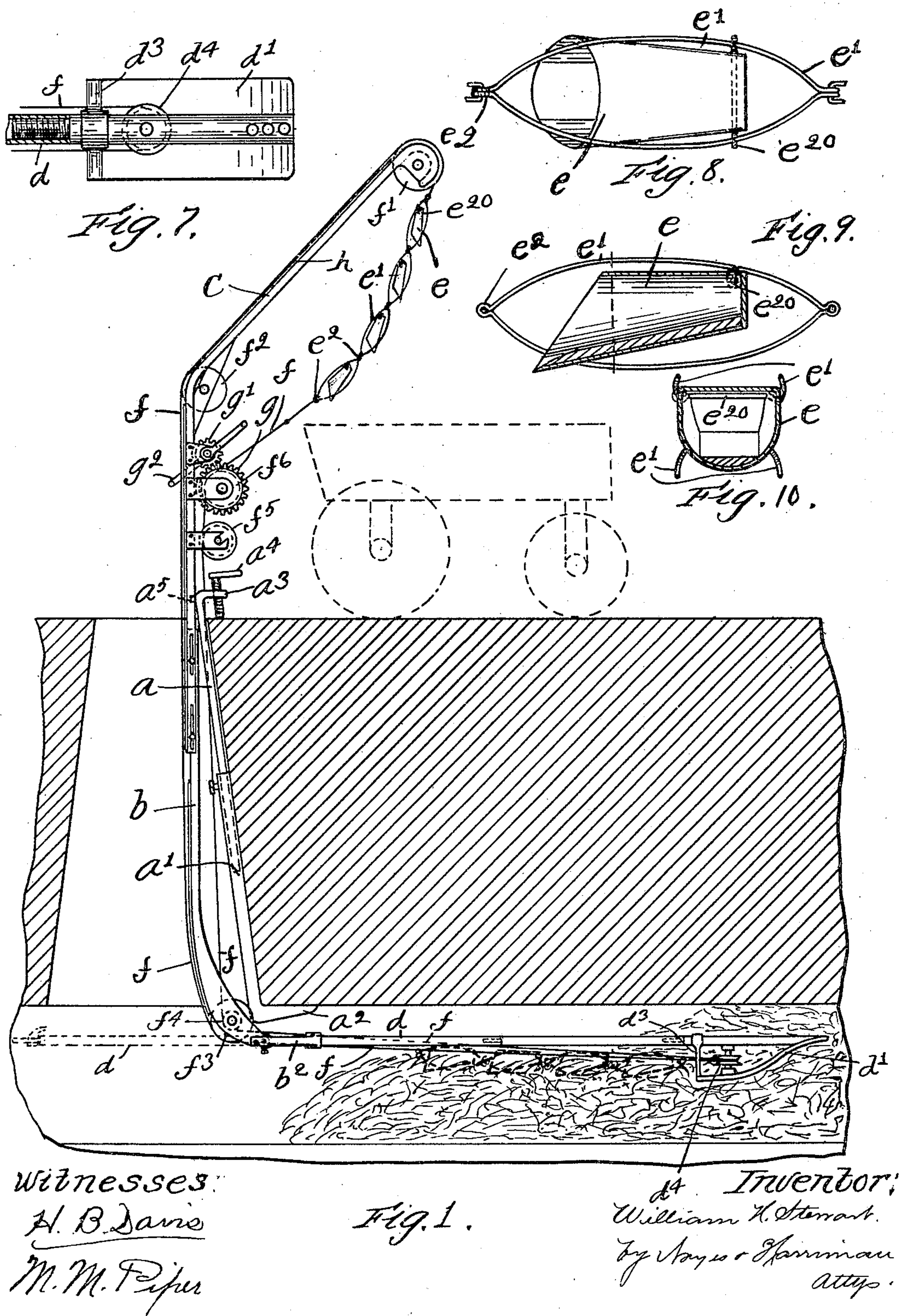


PATENTED AUG. 30, 1904.

APPLICATION FILED JULY 2, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

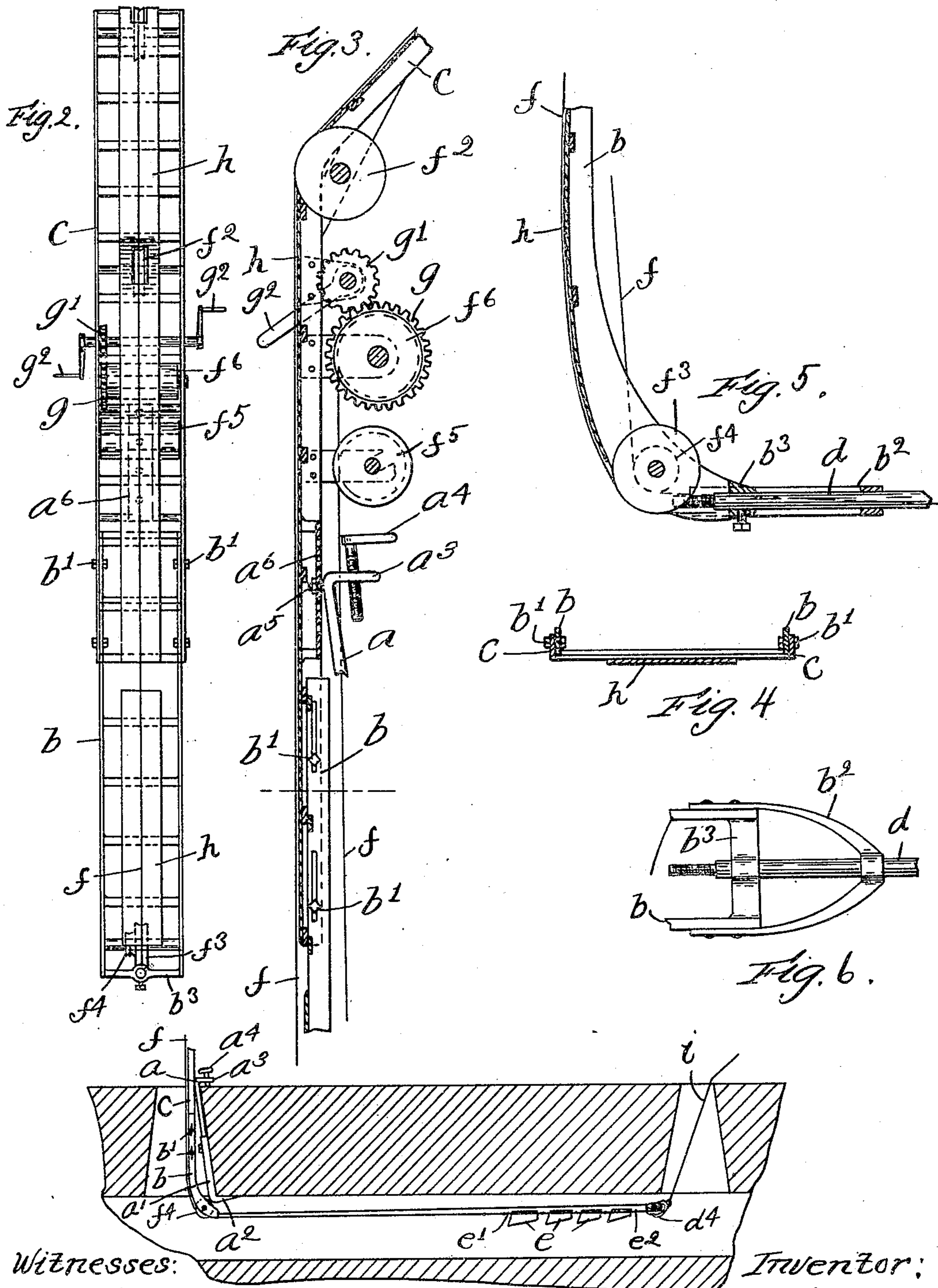


W. H. STEWART.
APPARATUS FOR CLEANING SEWER PIPES.

APPLICATION FILED JULY 2, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:

H. B. Davis.

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Fig. 11.

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UNITED STATES PATENT OFFICE.

WILLIAM H. STEWART, OF MALDEN, MASSACHUSETTS.

APPARATUS FOR CLEANING SEWER-PIPES.

SPECIFICATION forming part of Letters Patent No. 768,867, dated August 30, 1904.

Application filed July 2, 1903. Serial No. 164,013. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. STEWART, of Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in Apparatus for Cleaning Sewer-Pipes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object to construct an apparatus for cleaning sewer-pipes and for conveying the deposit taken from the pipes up through a manhole and for delivering it to a wagon of any suitable description, by which it may be carried away, the apparatus being of a portable character and adapted to be placed in position for operation and properly supported while it is being operated.

Figure 1 shows in side elevation a sewer-cleaning apparatus embodying this invention. Fig. 2 is a left-hand end elevation of the apparatus shown in Fig. 1. Figs. 3 to 10, inclusive, are enlarged details of parts of the apparatus to be referred to; and Fig. 11 is a modification to be referred to.

The main support of the apparatus comprises, essentially, an upright frame adapted to be placed in a manhole and to be disposed therein so as to occupy a position against the vertical wall thereof, said upright being composed of two bars a a' , telescopically connected together to provide for longitudinal adjustment, the lowermost bar a' having at its lower end a foot a^2 , which projects from the manhole into the sewer-pipe and engages the top wall thereof, and the uppermost bar a having at its upper end an ear a^3 , through which a set-screw a^4 passes, which is adapted to bear upon the upper edge of the manhole or upon the surface of the street. When the set-screw a^4 is turned down, the upright frame will be clamped in position and adapted to support the operating parts, and when said set-screw is turned in the opposite way said upright frame may be removed. The upper bar a has projecting from it a lug a^5 , (see Fig. 3,) which is preferably threaded to receive upon it a suitable nut, and said lug is designed and intended to project through any

one of a series of holes in a plate a^6 , which is supported by or forms a part of the framework of the apparatus. The framework of the apparatus is thus detachably connected to the main support.

The main framework of the apparatus comprises, essentially, two telescopically-connected open-work structures b c , which are herein shown as ladders—that is to say, they each comprise a pair of upright side bars and horizontally-connecting cross-bars or rounds. The ladder b has at its upper end bolts b' , which pass through slots c' , provided at the lower end of the ladder c , to provide for longitudinal adjustment of the framework. The longitudinal adjustment of the framework and also of the main support is provided to accommodate the apparatus to manholes of different depths. The plate a^6 , having the holes through which the lug on the main support passes, is secured to the lower end portion of the ladder c . By making the framework as a ladder it will be seen that provision is made for a person to descend to the bottom of the manhole for the purpose of adjusting the apparatus, as will be hereinafter described, and while I prefer to make both parts of the framework as ladders yet it will be understood that my invention is not limited to a framework of this construction.

The ladder b has at its lower end a suitable support for a section rod or bar, which is herein shown as a yoke b^2 , attached to the lower end of the ladder, and a cross-bar b^3 , which is also connected to the lower end of the ladder inside of the said yoke, said cross-bar and yoke having holes through them which are disposed in alinement, and thereby adapted to receive one end of the section-rod d and to support said section-rod in a horizontal position, so that it may be projected into the sewer-pipe. The section-rod d may be of any desirable length, being composed of a number of like sections fitted together, and if a greater or less length is required a greater or less number of sections will be employed. The endmost section of the rod has attached to its under side a shoe d' , (see Figs. 1 and 7,) one end of which is attached to the end of the rod

and the other end to a bracket d^3 , depending from the rod, and between said shoe and rod a support is provided for a pulley or sheave b^4 . The section-rod is projected any suitable distance into the sewer-pipe by the workman who stands at the bottom of the manhole and slides the rod along through the holes in the support, and as it is projected into the sewer-pipe the shoe rides over the deposit in said pipe. No connection is thus made with the next manhole. Several scoops or buckets e are attached to an endless chain or cord, there being four such scoops or buckets herein shown as attached to the endless chain or cord. These scoops or buckets may be made of any suitable shape, preferably having one open end and a transversely-curved bottom, as represented in Figs. 8, 9, and 10. Each scoop or bucket e is attached to and contained within an open-work structure or cage which comprises four wires e' , curved in the direction of their length and joined together at their opposite ends. As herein shown, each uppermost wire is or may be formed integral with the wire under it, and an eye e^2 is formed at each end of the wires to receive a link which loosely connects the several cages together, and the uppermost wire has an eye which receives the end of a cross-bar e^{20} , which is attached to the scoop or bucket. The cross-bar is located at the rear end of the scoop or bucket, and the forward end of the scoop or bucket projects down through the bottom of the cage and rests on the two lowermost wires of the cage. As the scoops or buckets are thus supported, it will be seen that the forward end projects a short distance from the cage and that the wires forming the cage serve as runners and guard the scoop or bucket, and thereby prevent the scoop or bucket from striking any projecting joints in the pipes. The opposite ends of this series of scoops or buckets are attached to the endless chain, and when the series is connected therein it forms a part of said endless chain.

f represents the endless chain, and said chain leads from the series of scoops or buckets over a pulley or sheave f' , which is supported at the upper end of the framework, thence over a pulley or sheave f^2 , likewise supported by the framework about midway the height of the upper part of the framework, thence over a pulley or sheave f^3 , which is supported at the lower end of the lower part of the framework, thence around the pulley or sheave d^4 , which is supported at the extremity of the section-rod, thence returning over the pulley or sheave f^4 , which is supported at the lower end of the lower part of the framework, thence over a roll f^5 , which is idly supported in suitable bearings in the upper part of the framework, making several turns on said roll, thence over a winch f^6 , making several turns thereon, and thence to

the opposite end of the series of scoops or buckets. The winch f^6 is the driving-roll, and for the purpose of driving it a toothed gear g is secured to the shaft of said roll, which is engaged by a pinion g' , secured to a shaft bearing a hand-crank g^2 . As the winch f^6 is revolved the endless chain will be moved and the series of scoops or buckets conveyed from the point shown in full lines, Fig. 1, to the point represented by dotted lines, Fig. 1, and as the scoops or buckets are thus moved the cage will slide along on the track h , which is provided on the framework, said track supporting the cage in such position as to enable the scoops or buckets to pass along freely. When the endless chain is operated and the scoops or buckets brought into the dotted-line position shown in Fig. 1, the direction of rotation of the roll f^6 is reversed and the endless chain operated and the scoops or buckets thereby caused to return to the full-line position shown in said figure. As the scoops or buckets are moved into the dotted-line position they will pass over the deposit in the sewer-pipe, and as said scoops or buckets return they will scoop up the deposit and convey it along the sewer-pipe and up the manhole to the street-level and then up over the top of the framework, and as the scoops or buckets descend upon the opposite side of said framework their position is reversed and the deposit drops into a suitable wagon by which it is carried away. The upper part of the framework is bent at a suitable angle to extend over the wagon to provide for thus delivering the deposit to the wagon. The weight of the scoops or buckets causes the chain to sag between the pulley or sheave f' and the winch f^6 , which enables the deposit to be delivered to the wagon as the scoops or buckets descend. The outer end of the section-rod which projects into the sewer-pipe will have a tendency to fall by gravity, so that the shoe which rests on the deposit will settle as soon as the scoops or buckets are operated. Furthermore, the scoops or buckets will also sag in the sewer-pipe by their own weight, and as said scoops or buckets have a transversely-curved bottom wall they will easily collect the deposit and deliver it to the wagon.

Instead of employing a section-rod, as shown in Fig. 1, the pulley or sheave d^4 may be supported at the end of a cord or chain, as i , (see Fig. 11,) which is drawn up through the next manhole, and in such event said pulley or sheave will be held by said cord or chain i while the endless chain is being operated.

It will be understood that while the bucket-carrying chain is endless yet it is operated first in one and then in the opposite direction and is therefore a reciprocating chain, as contrasted to one moving continuously in the same direction.

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

1. In an apparatus for cleaning sewer-pipes, 5
a bucket-carrying chain, buckets carried by it, supports for said chain, means for operating said chain, a framework bearing said supports which extends from approximately the bottom of the manhole to a point above said 10
manhole, a section-rod projecting from the lower end of said framework bearing at its extremity one of the supports of said chain, substantially as described.

2. In an apparatus for cleaning sewer-pipes, 15
a bucket-carrying chain, buckets carried by it, supports for said chain means for operating said chain, a framework bearing said supports which extends from approximately the bottom of the manhole to a point above said 20
manhole, a section-rod projecting from the lower end of said framework bearing at its extremity one of the supports of said chain, and also bearing a shoe, substantially as described.

25 3. In an apparatus for cleaning sewer-pipes, a bucket-carrying chain, a support therefor,

means for moving said chain, buckets carried by said chain, and a cage inclosing said buckets, substantially as described.

4. In apparatus for cleaning sewer-pipes, a 30
bucket-carrying chain, a support therefor, means for moving said chain, buckets carried by said chain, and a cage inclosing said buckets consisting of a plurality of wires to which said buckets are connected, substantially as 35
described.

5. In an apparatus for cleaning sewer-pipes, a bucket-carrying chain, a support therefor, means for moving said chain, a series of connected cages forming a part of said chain, a 40
bucket loosely connected to and inclosed by each cage, the forward end of which projects down through the bottom of the cage, substantially as described.

In testimony whereof I have signed my name 45
to this specification in the presence of two subscribing witnesses.

WILLIAM H. STEWART.

Witnesses:

B. J. NOYES,
H. B. DAVIS.