

No. 721,889.

PATENTED MAR. 3, 1903.

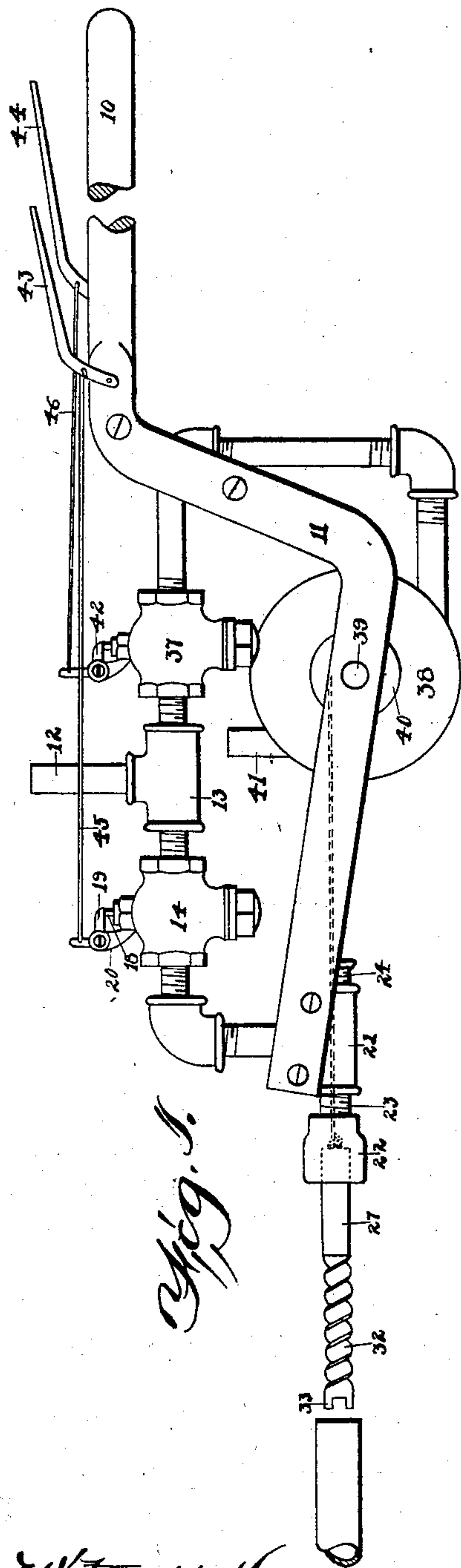
E. O. HENDERSON & J. B. THOMPSON.

BOILER FLUE CLEANER.

APPLICATION FILED MAR. 15, 1902.

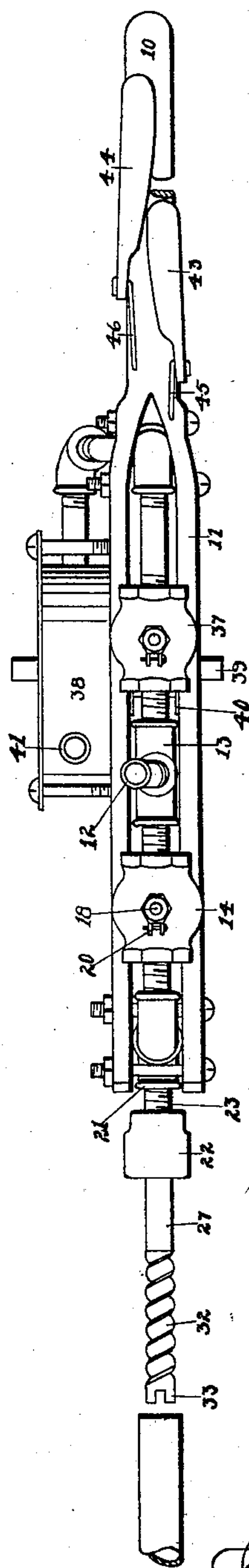
NO MODEL.

2 SHEETS—SHEET 1.



Witnessed:
J. R. Lowry.
R. B. Craig.

Fig. 2.



Inventor's
E. O. Henderson & J. B. Thompson
by Irving Lane Attys.

No. 721,889.

PATENTED MAR. 3, 1903.

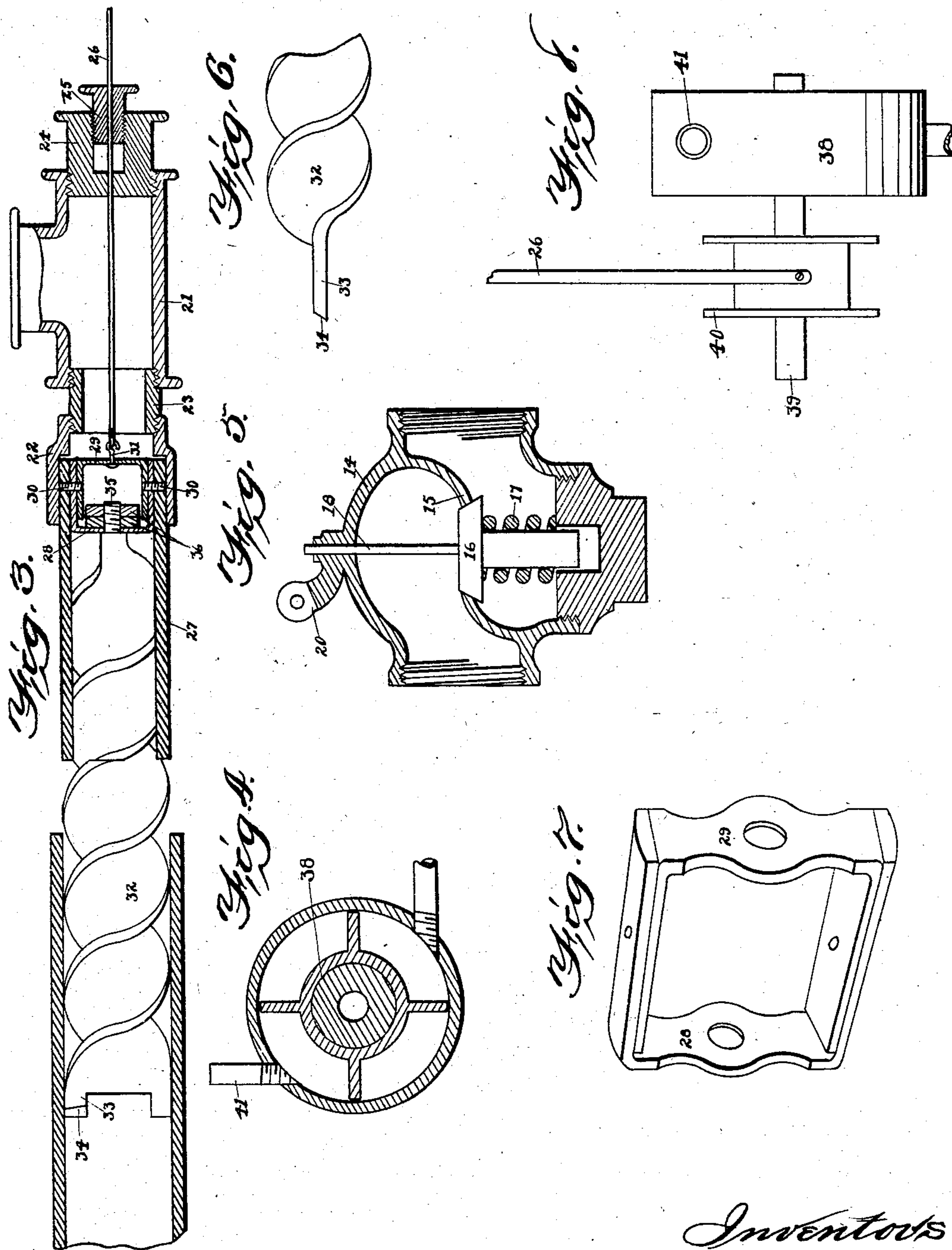
E. O. HENDERSON & J. B. THOMPSON.

BOILER FLUE CLEANER.

APPLICATION FILED MAR. 15, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:
F. R. Lowery.
R. G. Grigg.

Inventors
E. O. Henderson & J. B. Thompson
by Oring Lane Attys.

UNITED STATES PATENT OFFICE.

ELMER O. HENDERSON AND JACOB B. THOMPSON, OF OKOBOJI, IOWA.

BOILER-FLUE CLEANER.

SPECIFICATION forming part of Letters Patent No. 721,889, dated March 3, 1903.

Application filed March 15, 1902. Serial No. 98,341. (No model.)

To all whom it may concern:

Be it known that we, ELMER O. HENDERSON and JACOB B. THOMPSON, citizens of the United States, residing at Okoboji, in the county of Dickinson and State of Iowa, have invented certain new and useful Improvements in Boiler-Flue Cleaners, of which the following is a specification.

The objects of our invention are to provide a boiler-flue cleaner of simple, durable, and inexpensive construction, which can be readily, quickly, and easily handled and which is operated by steam, compressed air, or water under pressure, and, further, to provide a device of this class which when placed at the end of a boiler-flue will permit the auger attached to it to be driven at great speed and forced through a boiler-flue by steam, compressed air, or water under pressure to loosen the incrustations or deposits within the boiler-flue. In the event that the auger should stick and movement thereof cease the auger may be readily and quickly returned to its starting-point by the operator pressing upon the lever controlling the motor. When the auger is then advanced and rotated, the auger will strike the obstructions in the boiler-flue with such force as to dislodge the same and carry the deposits with it through the boiler-flue, because a portion of the flue will have been already cleaned at the first insertion and forward movement of the auger. If the deposit has been already-loosened, it will be blown through the flue by the steam, air, or water used to rotate the auger.

A further object is to provide a machine of this class of such light and compact form that it may be easily handled by one operator, and, further, to provide a flue-cleaner in which all of the movements of the auger are actuated by steam, air, or water and in which said auger is controlled by levers which may be easily operated.

Our invention consists in certain details in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of the com-

plete machine ready for use. Fig. 2 shows a top or plan view of same. Fig. 3 shows an enlarged vertical sectional view of the rotary sleeve in which the auger is mounted and the means for connecting the auger with the machine-frame and also a portion of a boiler-flue with the auger admitted therein. Fig. 4 shows an enlarged sectional view of the motor by which the auger is returned. Fig. 5 shows an enlarged sectional view of one of the valves for controlling the flow of the fluid for actuating the auger. Fig. 6 shows an enlarged view of the end portion of the auger, illustrating the manner in which the points at the end of the auger are sharpened. Fig. 7 shows in perspective the frame in which the end of the auger is rotatably mounted, and Fig. 8 shows a top or plan view of the motor-frame and the drum attached to the motor-shaft.

Referring to the accompanying drawings, we have used the reference-numeral 10 to indicate the handle of the machine-frame. The frame proper is composed of two parallel pieces connected with the handle, and the operative parts of the boiler-flue cleaner are mounted in this frame, as will hereinafter appear. These side pieces are indicated by the numeral 11.

The numeral 12 indicates a pipe designed to be connected with a tube leading from a source of supply of fluid under pressure. This pipe communicates with a T-joint 13. Communicating with one branch of the T-joint 13 is a valve-chamber 14, having a partition 15, provided with an opening into which a valve 16 is fitted. This valve is normally held in its closed position by the spring 17, and a valve-stem 18 projects upwardly through the casing and is engaged by the bell-crank lever 19, fulcrumed to a lug 20, formed on or fixed to the valve-casing, so that when the valve-stem 18 is pushed downwardly the valve is open and when the pressure on the valve-stem is removed the valve is automatically closed. The said valve-casing communicates at its other end with a T-joint, as at one end a socket 22, which communicates with the T-joint through the pipe 23. At the other end of this T-joint is a plug 24, having an ordinary packing-box 25, through which

a flat tape 26 is passed. The said socket 22 is substantially the same diameter as an ordinary boiler-flue.

The numeral 27 indicates a short cylinder, one end of which is capable of entering the socket 22. Contained in one end of this cylinder is a frame composed of two parts 28 and 29. These parts are held together and also connected with the cylinder by means of the screws 30. In the part 29 of this frame a bolt 31 is swiveled and the tape 26 is attached to said bolt. In the other part 29 of the frame we have rotatably mounted an auger constructed as follows:

The numeral 32 is used to indicate the body portion of the auger, which is of ordinary construction and is of a size designed to loosely fit the hole of the boiler-tube with which it is designed to work. The outer end of the auger is provided with two outwardly-projecting shoulders 33, sharpened at their outer ends 34. The inner end portion of the auger is made of smaller diameter than the outer end portion, and it fits the interior of the cylinder 27, and at the inner end of the auger is a stem 35, which passes through the part 28, and the locking-nuts 36 are screwed to its inner end on the inside of the part 28. In practical use and assuming that fluid under pressure is passed through the valve 14 it is obvious that this fluid will forcibly strike the auger, and will therefore cause the auger to rotate rapidly relative to the frame to which the stem of the auger is attached, and will also have the effect of advancing the auger, so that the cutting edges of this auger when rotated in the interior of the boiler-flue will engage and loosen any incrustation or other deposit that may be lodged in the flue.

Located at the opposite branch of the T-joint 13 is another valve (indicated by the numeral 37) similar in form to the valve before described, and this valve communicates with a rotary fluid-motor 38 of ordinary construction, which motor is mounted in the machine-frame and is provided with an axle 39, upon which a drum 40 has the tape 26 fixed thereto, and leading from the motor 38 is an exhaust-pipe 41. The valve 37 has a bell-crank lever 42 pivotally connected therewith and in engagement with its valve-stem, and mounted upon the handle 10 are two levers 43 and 44, the former lever being connected with the bell-crank 19 by means of the rod 45 and the latter being connected with the bell-crank 42 by means of the rod 46.

In practical use with our improved machine the operator carries the machine to the point where it is to be used and then simply places the auger in one end of the boiler-flue. Then he manipulates the lever 43 so as to open the valve 16, thus permitting the fluid under pressure to engage and rotate in advance of the auger. Obviously the fluid will pass through the boiler-flue beyond the auger, and in so

doing will tend to carry away all of the deposits that have been loosened by the auger. Assuming, however, that the incrustation or deposit is so thick as to stop the movement of the auger, then the operator simply releases the lever 43 and depresses the lever 44. This has the effect of directing the flow of the fluid through the valve 37 and into the motor 38, and as the motor is rotated the tape 26 will be wound upon the drum 40 and the auger will be quickly withdrawn from the boiler-tube, and when the fluid is again permitted to pass through the boiler-tube the auger will be given a considerable momentum before striking the obstruction in the boiler-flue, so that the work will be greatly facilitated. Then when the flue has been cleaned it is only necessary to wind the tape upon the drum by an operation of the lever 44 and the auger will be returned into the socket 22 and the machine will be in very compact form, so that it may be easily transported.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In a boiler-flue cleaner, the combination of a pipe for receiving fluid under pressure, an auger rotatably mounted at one end of said pipe, a valve for controlling the passage of fluid for returning the auger, and means for controlling the flow of the fluid whereby it may be directed either to the auger or to the auger-returning mechanism, for the purposes stated.

2. In a boiler-flue cleaner, the combination of a pipe, a rotatable auger at one end of the pipe and a fluid-motor at the other end of the pipe, a winding-drum connected with the fluid-motor, a tape attached at one end of the drum and at its other end to the auger, spring-closed valves controlling the passage-way toward the opposite ends of the pipe, and means for independently opening the said valves, for the purposes stated.

3. An improved boiler-flue cleaner comprising in combination a machine-frame, a pipe supported in the machine-frame and having one end open, a fluid-motor communicating with the other end of the pipe and having a winding-drum connected therewith, means for introducing fluid under pressure between the ends of said pipe, valves on said pipe for controlling the passage-way toward the ends of the pipe, means for independently operating said valves, a frame at the open end of said pipe, a tape connected with said frame and wound upon the said drum, and an auger rotatably connected with said frame, for the purposes stated.

4. In a machine of the class described, the combination of a small cylinder open at both ends, a frame mounted in one end of the cylinder, an auger rotatably mounted in the frame passed through the cylinder and some distance beyond it and being of larger diam-

eter at the end beyond the cylinder, and having cutting-points at its free end, for the purposes stated.

5 In a machine of the class described, an auger designed to enter a boiler-flue and loosely fit the interior thereof, beveled cutting-points at the outer end thereof, an open-ended cylinder surrounding the inner end of the auger and of the same exterior diameter
10 of the body portion of the auger, and a frame mounted at the other end of the cylinder and having the auger rotatably connected therewith.

6. In a machine of the class described, the
15 combination with a supply-pipe, a T-joint connected with the supply-pipe, a packing-box at one end of the T-joint, a tape passed through the packing-box, a socket connected with the other end of the T-joint, an open-
20 ended cylinder capable of entering a socket, a frame in the open-ended cylinder, means for rotatably connecting the tape with the frame, and an auger rotatably connected with the frame, for the purposes stated.

25 7. An improved boiler-flue cleaner, comprising in combination a machine-frame, a pipe supported by the machine-frame, a T-joint

between the ends of the pipe, a fluid-supply pipe entering one branch of the T, valves on the said pipe at opposite sides of the T, springs 30 for normally closing the valves, bell-crank levers for opening the valves against the pressure of the springs, levers fulcrumed to the machine-frame and rods connecting the said levers with the bell-crank levers for control- 35 ling the valve, a T-joint at one end of said pipe, a packing-box at one end of the T, a tape passed through the packing-box, a socket at the other end of the T, an open-ended cylinder, an auger in the open-ended 40 cylinder and capable of rotation relative to the cylinder, means for connecting said tape with the cylinder, a motor communicating with the opposite end of the pipe, a drum connected with the motor and having said tape 45 wound upon it, arranged and combined substantially as and for the purposes stated.

Des Moines, Iowa, February 15, 1902.

ELMER O. HENDERSON.
JACOB B. THOMPSON.

Witnesses:

FRANK D. TERWILLIGER,
JOHN RICHARDSON.