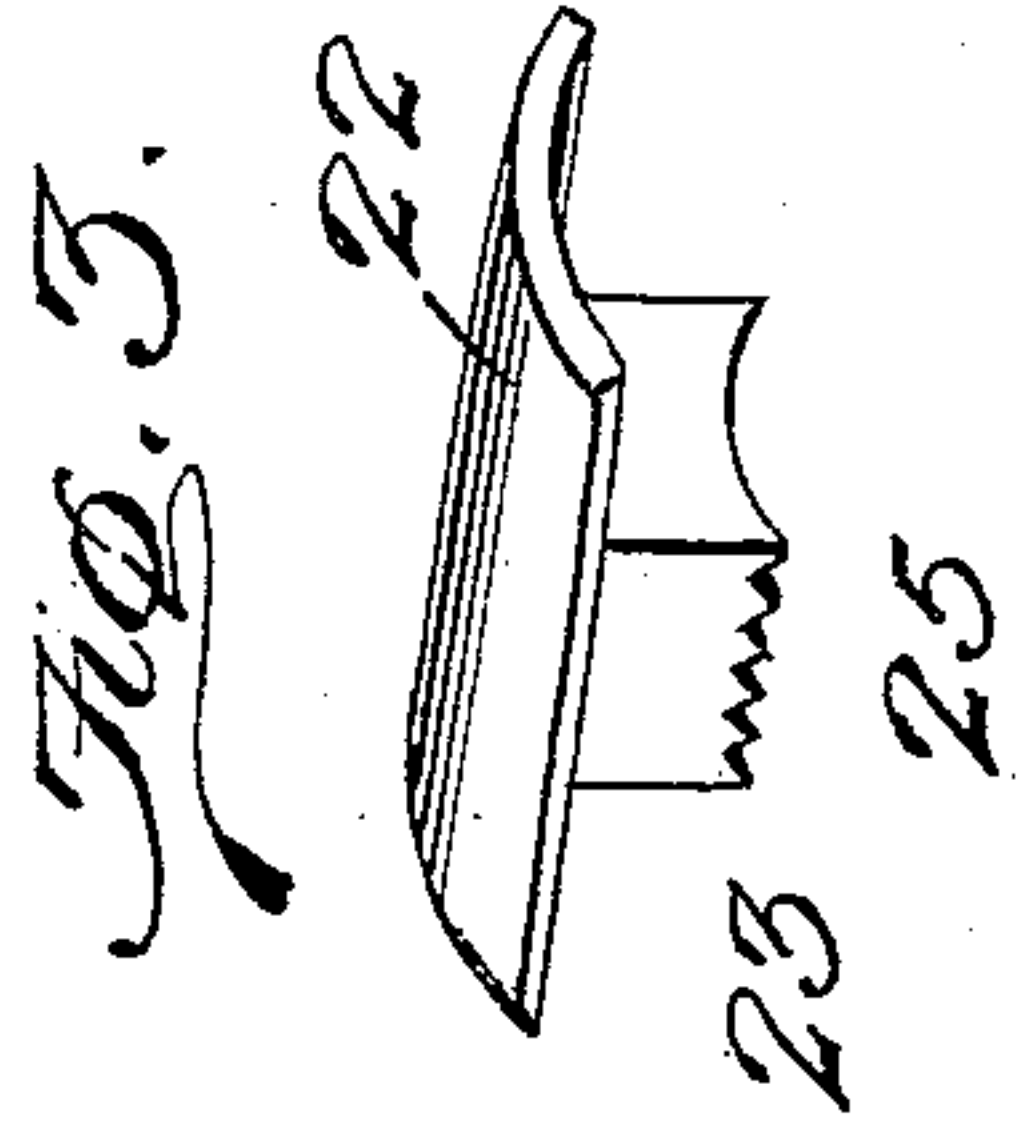
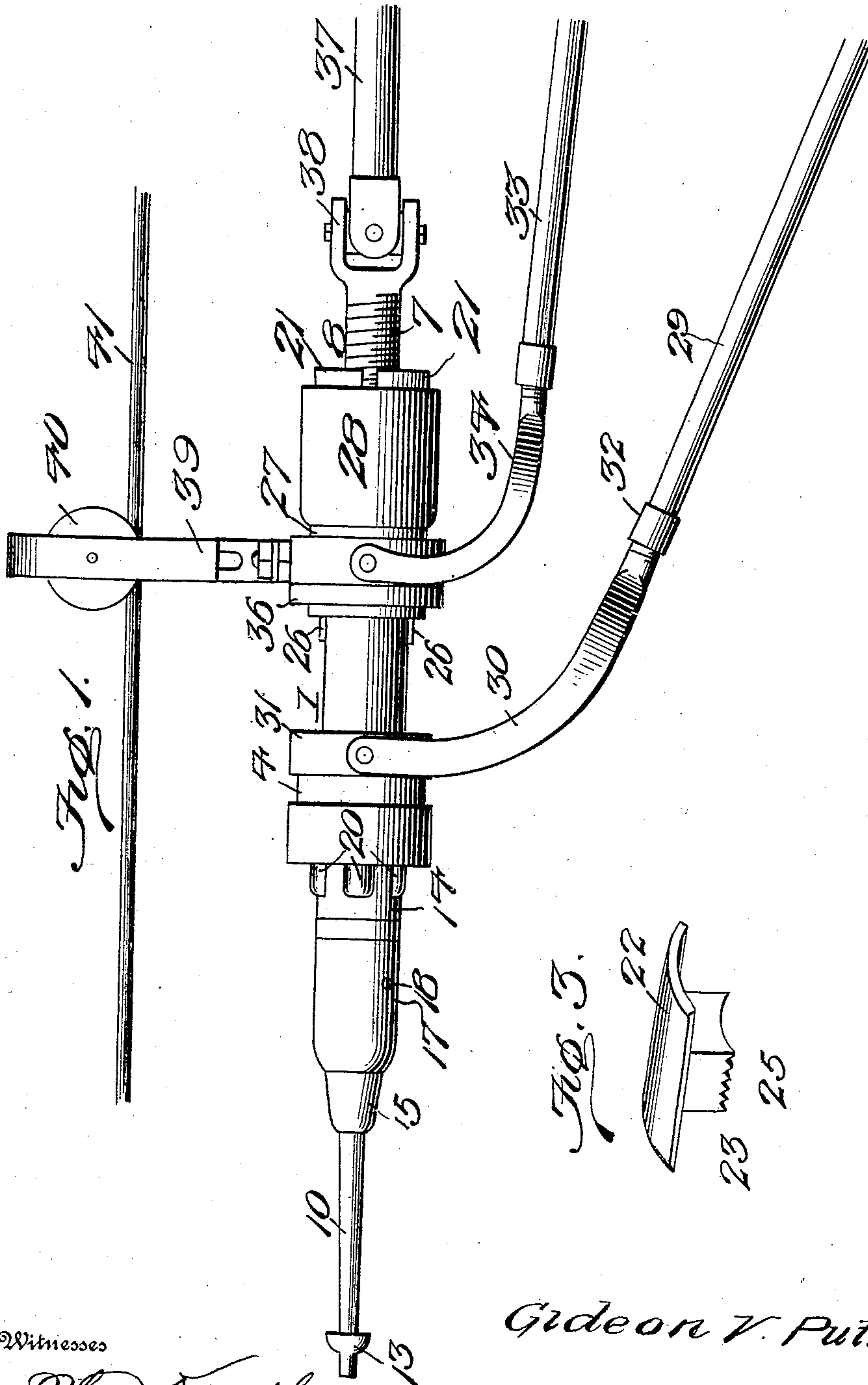


G. V. PUTMAN.
FLUE EXPANDER.
APPLICATION FILED AUG. 30, 1907.

908,497.

Patented Jan. 5, 1909.

2 SHEETS—SHEET 1.



Witnesses

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Hugo P. Donch

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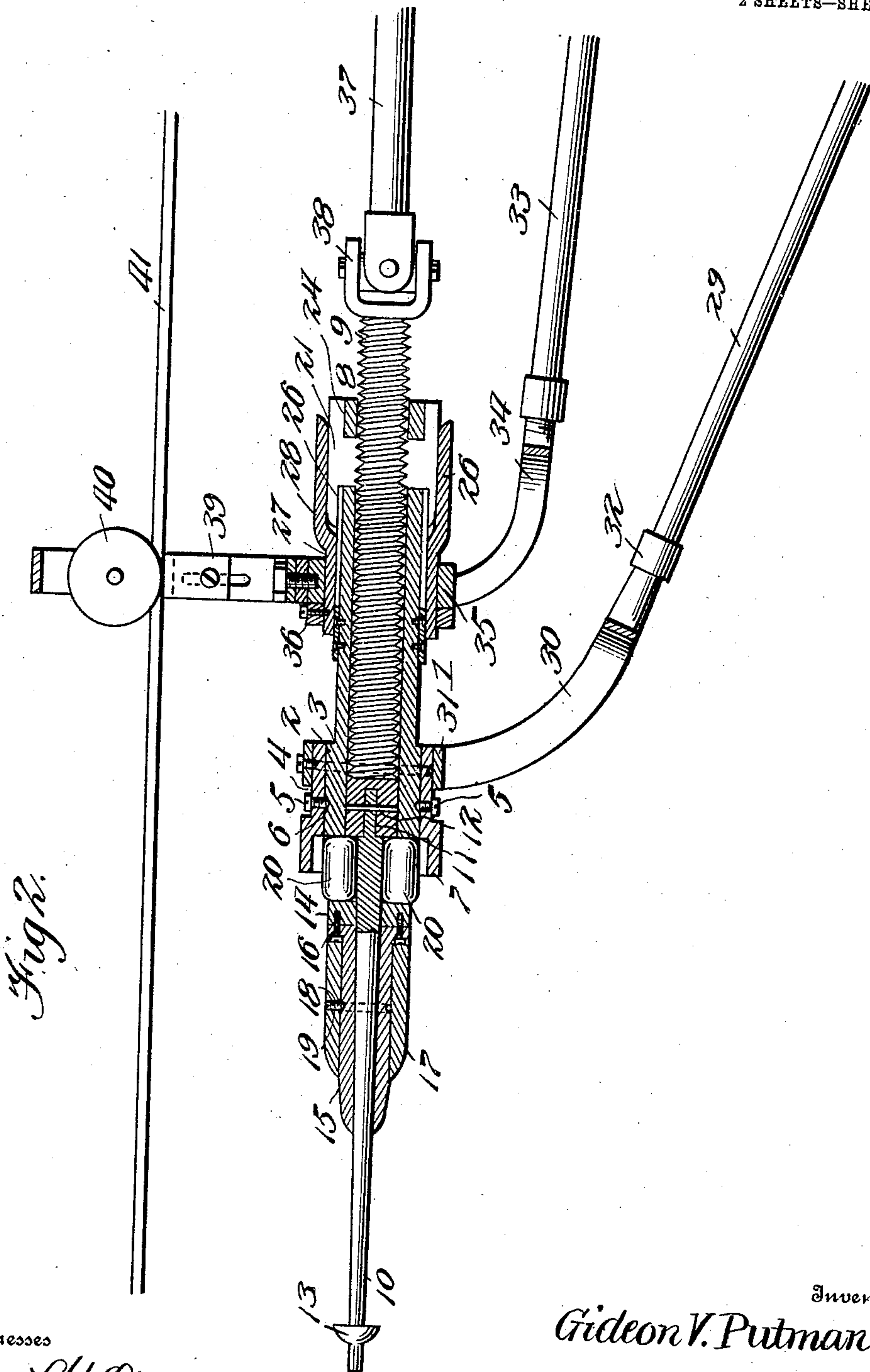
Attorney

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

GIDEON V. PUTMAN, OF GLOVERSVILLE, NEW YORK, ASSIGNOR TO JAMES D. ROGERS, OF JOHNSTOWN, NEW YORK.

FLUE-EXPANDER.

No. 908,497.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed August 30, 1907. Serial No. 390,813.

To all whom it may concern:

Be it known that I, GIDEON V. PUTMAN, a citizen of the United States, residing at Gloversville, in the county of Fulton and State of New York, have invented new and useful Improvements in Flue-Expanders, of which the following is a specification.

The invention relates to an improvement in flue expanders, comprehending specifically a tool constructed and arranged for tightening locomotive boiler flues without the necessity of removing the fire from the fire box or relieving the steam pressure.

The main object of the present invention is the production of a flue expander and tightener so constructed as to permit its convenient movement as a whole in initially adjusting the expanding members, and the utilization of the screw principle in forcing the expanders to their work.

The invention will be described in the following specification, reference being had particularly to the accompanying drawing, in which:—

Figure 1 is a view in elevation illustrating a flue expander constructed in accordance with my invention, Fig. 2 is a similar view with a portion of the expander shown in longitudinal central section, Fig. 3 is a perspective of one portion of the clamp nut.

Referring particularly to the drawings, my improved flue expander and tightener comprises a cylindrical body 1 of sleeve-like form, the relatively forward portion of which is circumferentially enlarged at 2 to form in rear of said enlarged portion an abrupt shoulder 3. A guide ring 4 is movably secured upon the enlarged portion of the body, being secured against independent longitudinal movement through the means of lock pins 5 seated in the guide ring and entering a circumferential groove 6 in the body. The guide ring extends beyond the forward end of the body in the form of a laterally offset circumferential flange 7, designed in the use of the device to bear against the crown sheet surrounding the flue being operated upon.

Mounted within the body is a spindle 8, made up of a threaded stem 9, forming the rear end of the spindle, and a guide extension 10, forming the forward portion of the spindle, said guide extension having a rearwardly extending centrally disposed projection 11 adapted to seat in a slotted opening in the end of the stem 9 and be secured there-

in by a transverse pin 12. This construction provides for the ready disconnection of the parts when required for repair or renewal.

The spindle extension 10 is, for the greater portion of its length, of tapering rod-like form, being provided adjacent the forward end with a guide abutment 13. The forward portion of the body, as 14, is arranged to provide the forward support for the expanding rollers, as shown in Fig. 2. A body extension 15 encircles the rear portion of the reduced section of the spindle extension, being secured to the enlarged portion of said extension by screws 16. A bearing ring 17 encircles the body extension, being held against independent longitudinal movement and permitted free revoluble movement thereon through the medium of pins 18 passing through the ring and taking into a circumferential groove 19 in the body extension 15, the ring thus serving in the nature of an antifriction roller in the use of the implement.

Expanding members, as rollers 20, are mounted for free revoluble movement in openings formed in and immediately adjacent the end of the body 1, the peripheral surfaces of said rollers extending beyond the plane of the enlarged portion of the spindle extension, but being spaced from the inner surface of the flange 7 of the guide ring.

The rear end of the body 1 is provided with a clamp nut made up in two sections 21, each comprising a head plate 22 conforming to and adapted to bear against the outer surface of the body 1, and an offset block 23 arranged to project through an opening 24 in the body and having the relatively inner edge threaded to cooperate with the threaded stem 9. The respective sections of the clamp nut are maintained in spread or inoperative position through the medium of leaf springs 26 secured to the body 1 and terminally bearing beneath the plates 22 of each section.

The sections of the clamp nut are forced into operative position through the medium of a clamping sleeve 27 formed at the relatively forward portion to slidably encircle the body 1, and at the relatively rear portion with a circumferentially enlarged clamping section 28 adapted in the rearward movement of the clamping sleeve to engage the outer surfaces of the plates 22 and force the clamping sections 21 of the clamping nut

inward to dispose the blocks 23 in a position to cooperate with the threaded stem 9 of the spindle.

An operating handle 29 is secured to the guide ring 4 through the medium of a connector 30 including spaced arms engaging a ring 31 secured to the guide ring, said connector being provided with a threaded socket 32 to receive the end of the handle 29. A clamping handle 33 is similarly connected through the medium of a connector 34 and a ring 35 with the clamping sleeve 27, said ring encircling the reduced portion of said sleeve and being held in place by a check ring 36. A spindle handle 37 is connected to the rear end of the stem 9, preferably through the medium of a universal connection 38.

A supporting member is secured to the ring 35, comprising a plurality of bars 39 adjustably connected for longitudinal extension through the medium of a slotted pin connection, the upper bar carrying a circumferentially grooved pulley 40 arranged to engage and travel longitudinally of a support rod 41.

In operation the supporting rod 41 is loosely inserted into a flue above the one to be operated upon. The pulley 40 is then engaged with the rod, the clamp sleeve 27 released from engagement with the clamp nut section and the spindle moved rearwardly until the expanding rollers 20 engage the end of the body. The handle 33 is operated to move the sections of the clamp nut into cooperation with the stem of the spindle, and the entire tool is then moved on the guide rod 41 to dispose the spindle extension and cooperating parts within the flue to be tightened. The handle 29 is secured in this position by any suitable fastening means, the clamp sleeve again released and the spindle forced manually forward as far as possible. The clamp sleeve is again operated to force the clamp nut sections to operative position and the spindle handle 37 is turned forcing the spindle into the flue through engagement of the threaded stem 9 and the clamp nut section, the expanding rollers 20 serving their normal and usual function during this movement. When the flue has been sufficiently tightened the spindle handle is operated in the reverse direction to withdraw the expanding members, and the tool withdrawn.

It is to be particularly noted that the clamp nut section may be engaged with or released from the threaded portion of the spindle at will, thereby permitting the free longitudinal movement of the spindle in initially adjusting the parts and the utilization of the screw principle only when directly op-

erating the expanding members for their particular purpose.

Having thus described the invention what is claimed as new, is:—

1. A flue tightener comprising a body, a spindle mounted for movement therein, a portion of said spindle being threaded, a sectional clamp nut operating through the body to engage the threaded portion of the spindle, means for normally maintaining the sections of the clamp nut in inoperative position, manually operable means for forcing said sections into operative position, a guide ring movably connected to the body, and implement holding means connected directly to the guide ring.

2. A flue tightener comprising a body, a spindle mounted for movement therein, a portion of said spindle being threaded, a sectional clamp nut operating through the body to engage the threaded portion of the spindle, means for normally maintaining the sections of the clamp nut in inoperative position, a manually operable clamping sleeve for forcing said sections into operative position, and supporting means for the flue tightener connected to the clamping sleeve.

3. A flue tightener comprising a body, a guide ring movably mounted on the forward end of the body, a handle directly connected to said ring, a spindle mounted for movement therein, a portion of said spindle being threaded, a sectional clamp nut operating through the body to engage the threaded portion of the spindle, means for normally maintaining the sections of the clamp nut in inoperative position, manually operable means for forcing said sections into operative position, and a handle connected to the spindle.

4. A flue tightener comprising a body, a guide ring mounted on the body, a spindle mounted for movement therein, a portion of said spindle being threaded, an expanding roller carried by the spindle and normally housed partly within the guide ring, a sectional clamp nut operating through the body to engage the threaded portion of the spindle, means for normally maintaining the sections of the clamp nut in inoperative position, a manually operable clamping sleeve for forcing said sections into operative position, a ring encircling said sleeve, a handle connected to the ring, and a tool supporting member rising from the ring.

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

GIDEON V. PUTMAN.

Witnesses:

W. H. DAILEY,
LEIGHTON ALLEN HALL.