945,334.

A. F. LENT.

RATCHET JACK.

APPLICATION FILED MAY 14, 1908.

Patented Jan. 4, 1910.

2 SHEETS—SHEET 1.

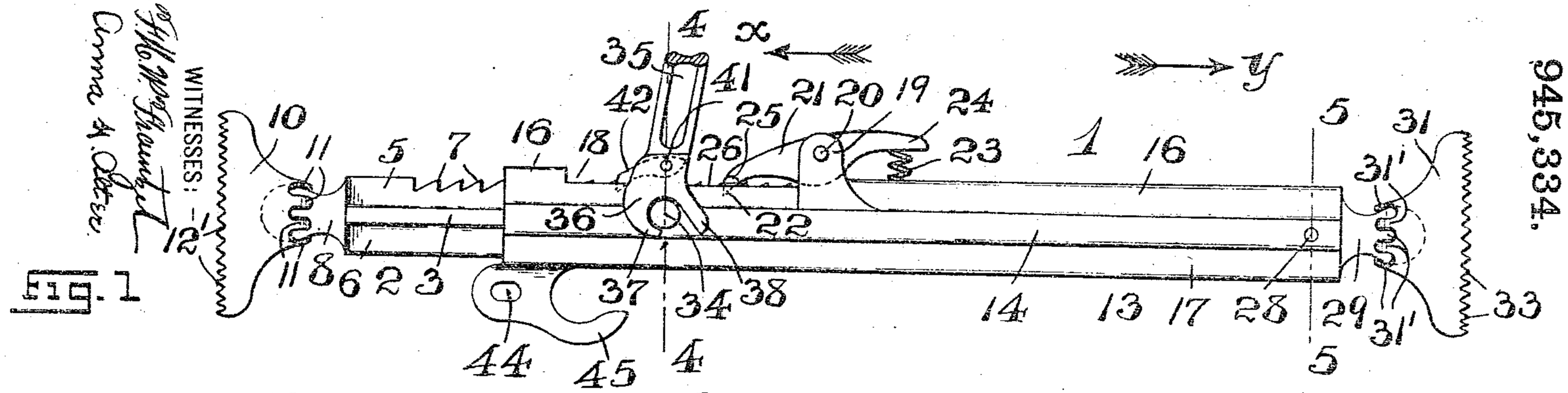

FIG. 1

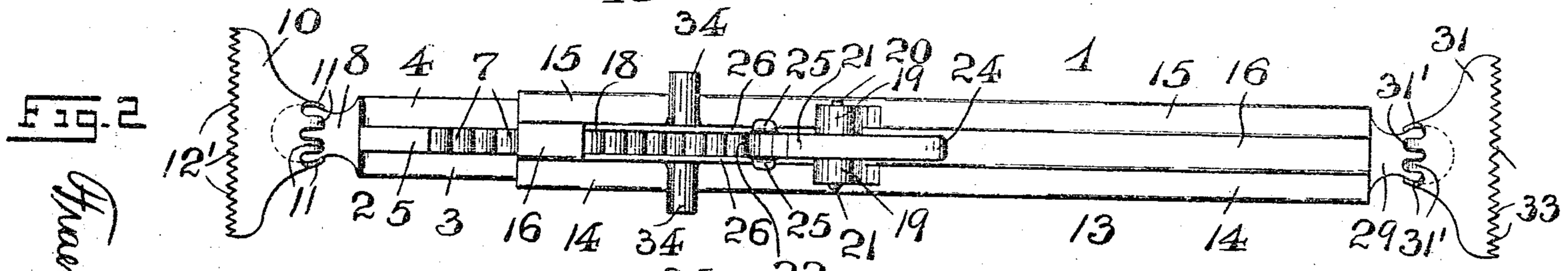

FIG. 2

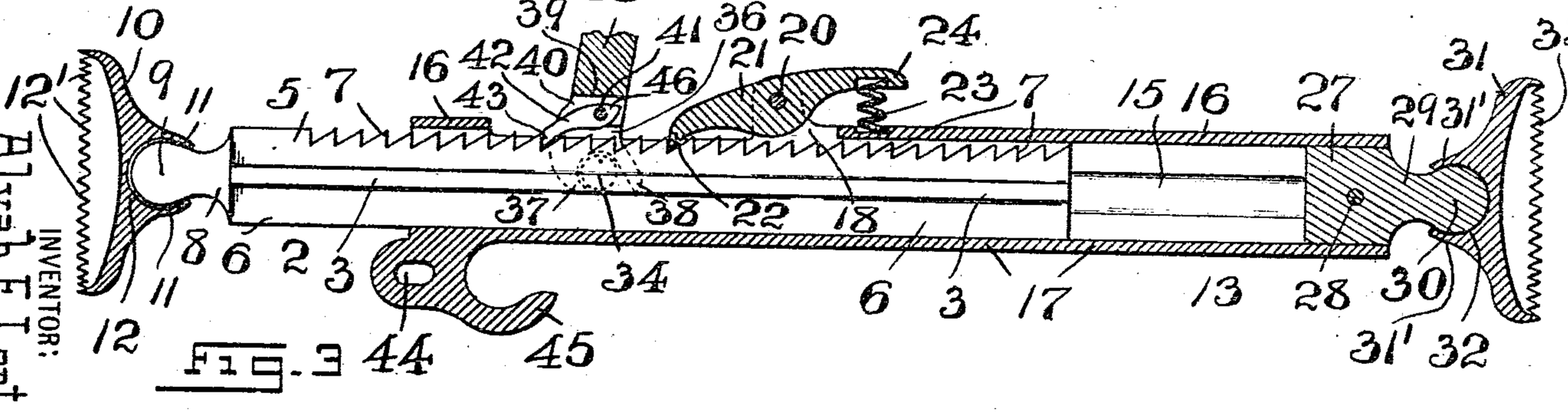

FIG. 3

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2 SHEETS—SHEET 2.

35

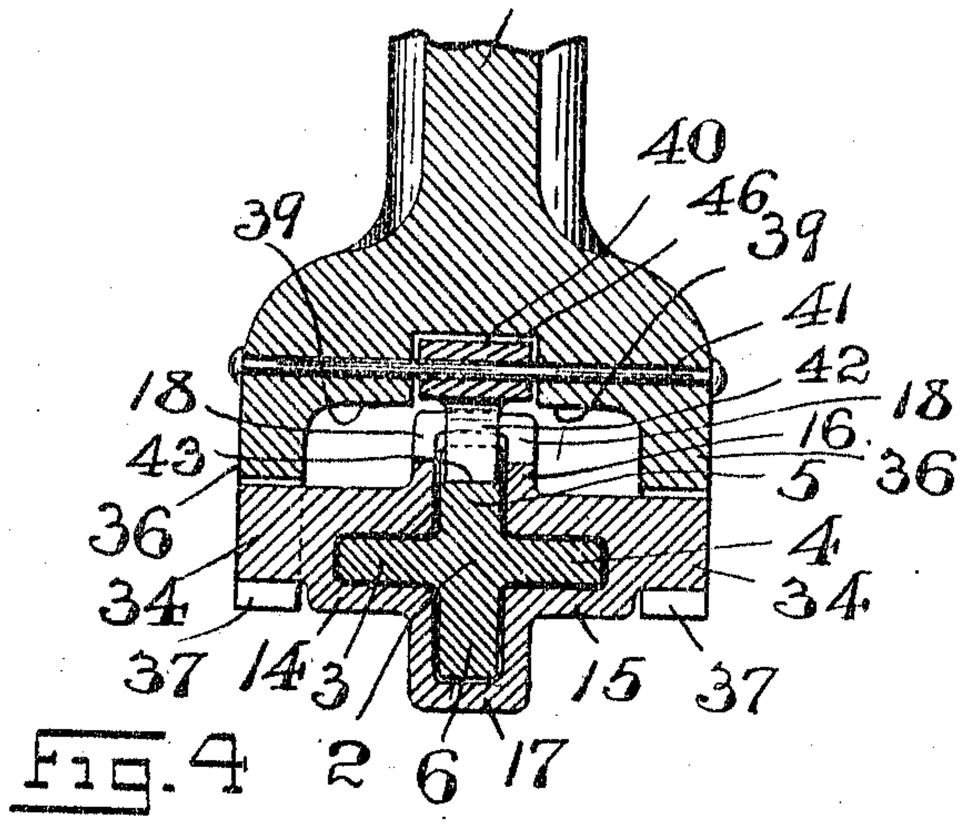

Fig. 4

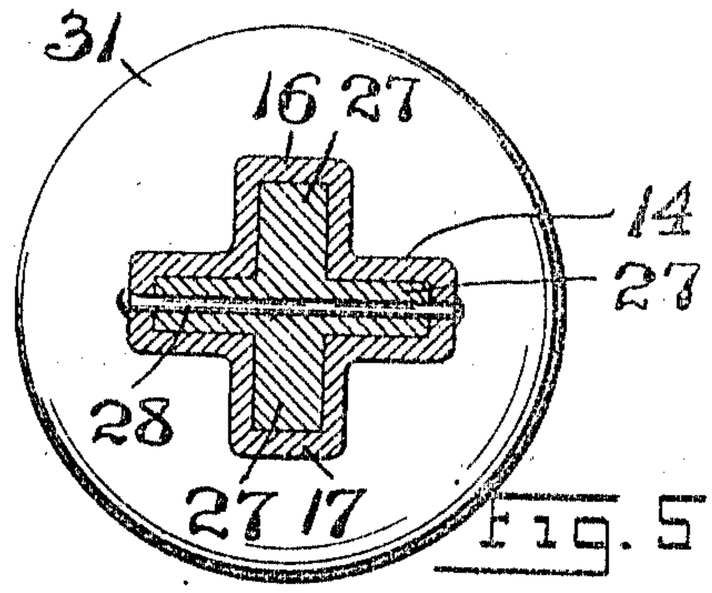

Fig. 5

35

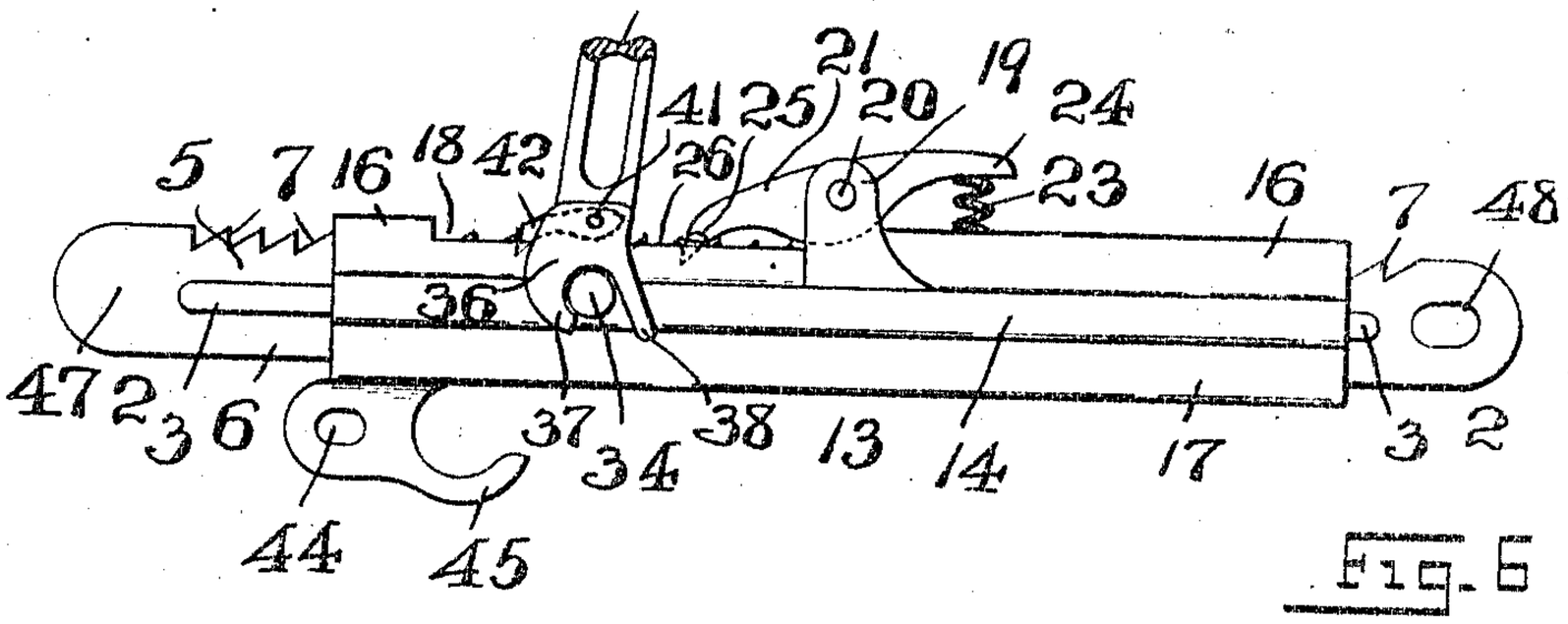

Fig. 6

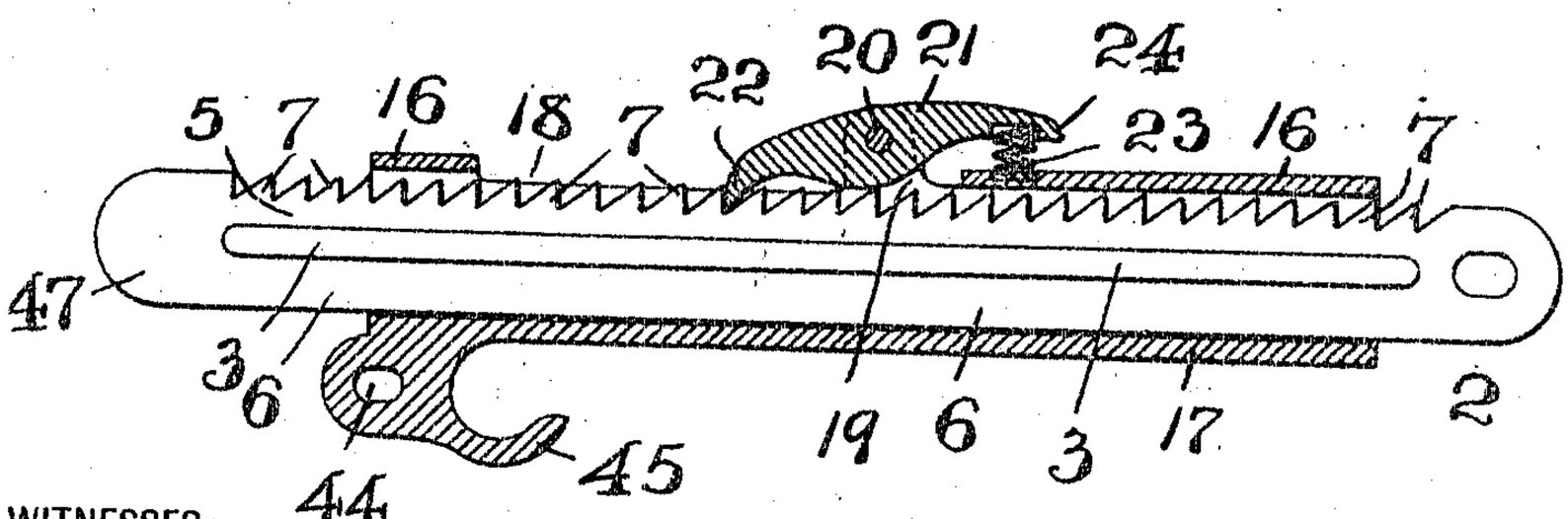

Fig. 7

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UNITED STATES PATENT OFFICE.

ALVAH F. LENT, OF NEWARK, NEW JERSEY.

RATCHET-JACK.

945,334. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed May 14, 1908. Serial No. 432,783.

To all whom it may concern:

Be it known that I, ALVAH F. LENT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Ratchet-Jacks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ratchet-jacks and comprises a jack adapted for use as a sewer jack, or for lifting heavy objects, or for stretching wire, cables or the like, or for other uses for which such jacks are commonly employed.

My said jack comprises two telescopic members of cruciform shape in cross section, one member fitting within the other, the ribs of such inner member fitting within recesses in the outer member formed within the ribs of such outer member, and guided thereby; said inner member having ratchet teeth on one of its ribs, the outer member having an opening opposite a portion of the ratchet toothed rib of the inner member, and having a holding pawl adapted to work through such opening against such teeth, and having also fulcrum-pins adapted to be engaged by a ratchet bar, itself provided with a tooth to engage the said ratchet teeth through the said opening.

My invention further comprises an improved construction of the ratchet bar.

The objects of my invention are to improve the construction of jacks such as referred to, to make such jacks of great strength and stiffness in proportion to the amount and character of metal used, and to make such jacks very simple, easily constructed, easily operated and relatively inexpensive.

I will now proceed to describe my invention with reference to the accompanying drawings and will then point out the novel features in claims.

In said drawings: Figures 1 and 2 are respectively, a side elevation and a front view of one form of my said jack, and Fig. 3 shows a central longitudinal section of such jack on a plane parallel to that of Fig. 1. Fig. 4 shows a transverse section of the jack and the ratchet-bar for operating it, the section being taken on the line 4—4 of Fig. 1, looking in the direction of the arrow *x*. Fig. 5 shows a transverse section of the jack taken on the line 5—5 of Fig. 1, looking in the direction of the arrow *y*; both of these views being on a scale larger than that of Figs. 1–3 inclusive. Fig. 6 is a side view of an alternative form of jack particularly adapted for stretching wires and cables and the like; and Fig. 7 is a central longitudinal section of this alternative form of jack.

The form of the jack shown in Figs. 1–3 inclusive, is a form particularly adapted for use as a sewer jack, or for lifting weights, and similar purposes.

Referring first to Figs. 1–5 inclusive, the jack there shown is designated by the general reference character 1; said jack comprising an inner member 2, of cruciform shape in cross section, and an outer hollow member 13, also of cruciform shape in cross section; the inner space of this member 13 being also cruciform in cross section. Member 2 is arranged to telescope within member 13. By reason of its cruciform shape in cross section, member 2 has ribs 3, 4, 5 and 6 of which rib 5 is provided with ratchet teeth 7. The member 13 has corresponding ribs 14, 15, 16 and 17, which, as shown, are hollow, the sides of the spaces within these ribs forming guides for the ribs 3, 4, 5 and 6 of the member 2. By reason of the cruciform shape in cross section of these two jack members, they are stiffened against flexure in all directions and have maximum strength and stiffness, for the amount and character of material used in their construction. At the same time the forms of these parts are very simple, so that they are readily constructed.

The outer jack member is provided, in its rib 16 opposite the ratchet toothed rib 5 of the other member 2, with an opening 18 through which a pawl of a ratchet bar hereinafter mentioned, may engage the teeth 7; this opening being, preferably, much shorter than the total length of the toothed portion of the rib 5. Jack member 13 also is provided with lugs 19 supporting, by means of a pivot pin 20, a holding pawl 21 having a tooth 22, likewise adapted to project through opening 18 into engagement with one or another of the teeth 7; a spring 23 being provided which engages the rear or handle end 24 of this pawl 21, said spring tending

to press said rear portion of the pawl outward, so as to hold the tooth 22 in engagement with the jack member 2.

For opening the jack, I provide a removable ratchet bar or lever 35, provided with a forked end 36 slotted at its end, as shown, to fit over fulcrum pins 34 projecting from the side-ribs 14 and 15 of jack member 13; said fulcrum pins lying within the main lateral width of member 13 measured in a direction at right angles to the axis of these fulcrum pins 34, so that in this jack I have avoided the use of the extending lugs to support a fulcrum pin, with which most ratchet jacks are provided, which lugs usually extend so far outward as to be much in the way and to add considerably to the weight of the jack, besides making the jack more difficult to construct. The lower lugs 37 of the ratchet bar have a curved bearing surface with respect to the fulcrum pins 34, so that when the ratchet bar is in use the pressure is distributed well over the surfaces of these fulcrum pins. The inner edges of the upper lugs 38 of the ratchet bar are preferably straight, as this facilitates the passing of the ratchet bar over the fulcrum pins.

Within the forked end of the ratchet bar there is a pawl 42, pivoted to said ratchet bar by pin 41, and adapted to engage the teeth 7 through the opening 18. The location of this pawl 42, within the forked end of the ratchet bar, is such that said pawl is practically protected against breakage when the bar is removed from the jack, said bar being then in effect a simple, practically-straight bar, free from projecting parts which complicate the construction of the bar and which are apt to be broken off.

The jack may be provided with various forms of end pieces to adapt it for various uses. In the form shown in Figs. 1–3 inclusive I have shown it provided with base pieces 10 and 31, on its opposite ends, connected to the members 2 and 13 respectively, by ball-and-socket joints, comprising ball-shaped ends 9 and 30, respectively, embraced by ears 11 and 31′ respectively of the base pieces 10; and I have shown these base pieces provided with teeth or serrations, 12′ and 33; but the particular construction of the base pieces is optional. Since the member 13 is hollow, its ball-shaped end comprises a body 27 adapted to fit within the end of the member 13 and held therein by suitable means, as for example by a transverse pin 28. The jack as so constructed may be used as an ordinary ratchet jack, for lifting weights or for bracing the sheathing of sewer trenches, and for like uses. I have also shown the member 13 provided on its rear side, with a hook 45 provided with an eye 44, which hook, or eye, or both, may be used for the attachment for the end of a cable, chain, wire or the like, when the jack is to be used for drawing taut a chain, or cable, or wire, or the like.

In the alternative construction shown in Figs. 5 and 6, I have shown the member 2 of the jack provided at its end with the eye 48, and have shown this member 2 as of a length adapting it to project from both ends of the jack member 13; this construction being particularly suitable when the jack is to be used simply for drawing taut cables, chains and the like.

This jack is to be used in the usual manner and therefore no special description of such method of use is required. It will be observed that the ratchet bar 35 is readily attached or detached, and when the jack has once been adjusted, this ratchet bar will customarily be removed so that it is at once out of the way and not liable to be broken.

The holding pawl 21 is provided near its tooth 22, with laterally projecting lips 25 adapted to ride upon the sides 26 of the opening 18, and thereby to prevent the tooth of said pawl from dropping too far between the teeth 7. These ribs also prevent the spring 23 from working loose.

In order that the pawl 42 may never move to a position such that it will interfere with placing the ratchet bar 35 on the jack, said pawl is provided with a rearward projection 46 which prevents said pawl from moving into line with the ratchet bar itself.

What I claim is:—

1. A ratchet jack comprising two members of cruciform-shape in cross section, one member adapted to slide within the other, its ribs guided by the sides of recesses formed in the ribs of the other said member, said inner member provided on one of its ribs with ratchet teeth, the corresponding rib of the other member having an opening; said outer member provided with a holding pawl adapted to engage said teeth through said opening, and having on its side ribs, laterally projecting fulcrum pins adapted for engagement by a ratchet bar.

2. A ratchet jack comprising a tubular member and another member adapted to slide back and forth within said tubular member, said tubular member of cruciform shape in cross section inside and outside, the channels within its ribs forming guides for the inner member, said inner member also cruciform in cross section, one of the ribs of said inner member provided with ratchet teeth, the corresponding rib of the outer member having an opening; said outer member provided with a spring actuated holding pawl adapted to engage said teeth through said opening, and having on its side ribs laterally projecting fulcrum pins lying within the width of said outer member measured in a direction at right angles to the axis of said fulcrum pins, said pins adapted for engagement by a ratchet bar.

3. In a ratchet jack, the combination, with telescopic jack-members, one of which is provided with ratchet teeth and the other with laterally projecting fulcrum-pins, of a forked ratchet-bar having the ends of its fork slotted to fit over and engage said fulcrum pins and having within its fork a pawl adapted to engage the said ratchet teeth.

4. In a ratchet jack, the combination, with telescopic jack-members, one of which is provided with ratchet teeth and the other with laterally projecting fulcrum-pins, of a forked ratchet-bar having the ends of its fork slotted to fit over and engage said fulcrum pins and having within its fork a pawl adapted to engage the said ratchet teeth, said pawl provided with a rearward projection adapted to engage the back of the forked portion of said bar and thereby prevent said pawl from moving into line with the fork.

5. In a ratchet jack, the combination with two telescopic members adapted to fit one within the other, said inner member provided with ratchet teeth, of a holding pawl pivoted to the outer member and adapted to engage said ratchet teeth, and having laterally projecting lips arranged to engage the sides of said outer member and regulate the extent of movement in one direction of said pawl, and a spring for pressing said pawl into engagement with said teeth.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 13th day of May 1908.

ALVAH F. LENT.

Witnesses:
FREDK. C. FRAENTZEL,
ANNA H. ALTER.