

No. 712,887.

Patented Nov. 4, 1902.

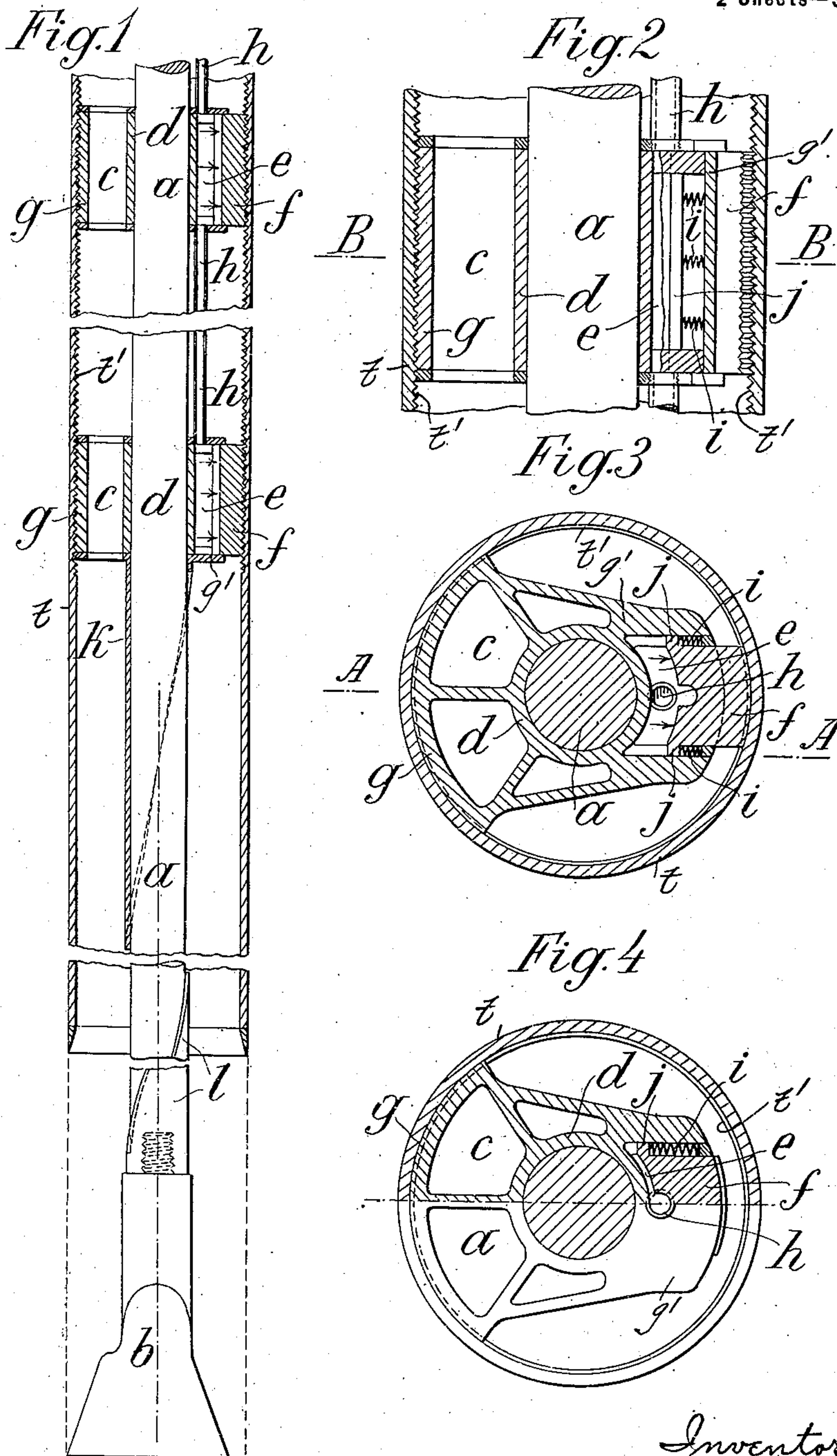
**J. WYCZYNSKI.**

CENTERING AND GUIDING DEVICE FOR DEEP BORING APPARATUS WITH  
ECCENTRIC BORING TOOL.


(Application filed May 9, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
B. L. Summers  
Henry [unclear]

Inventor:  
Josef Kyczynski  
by  Murray M. Latimer

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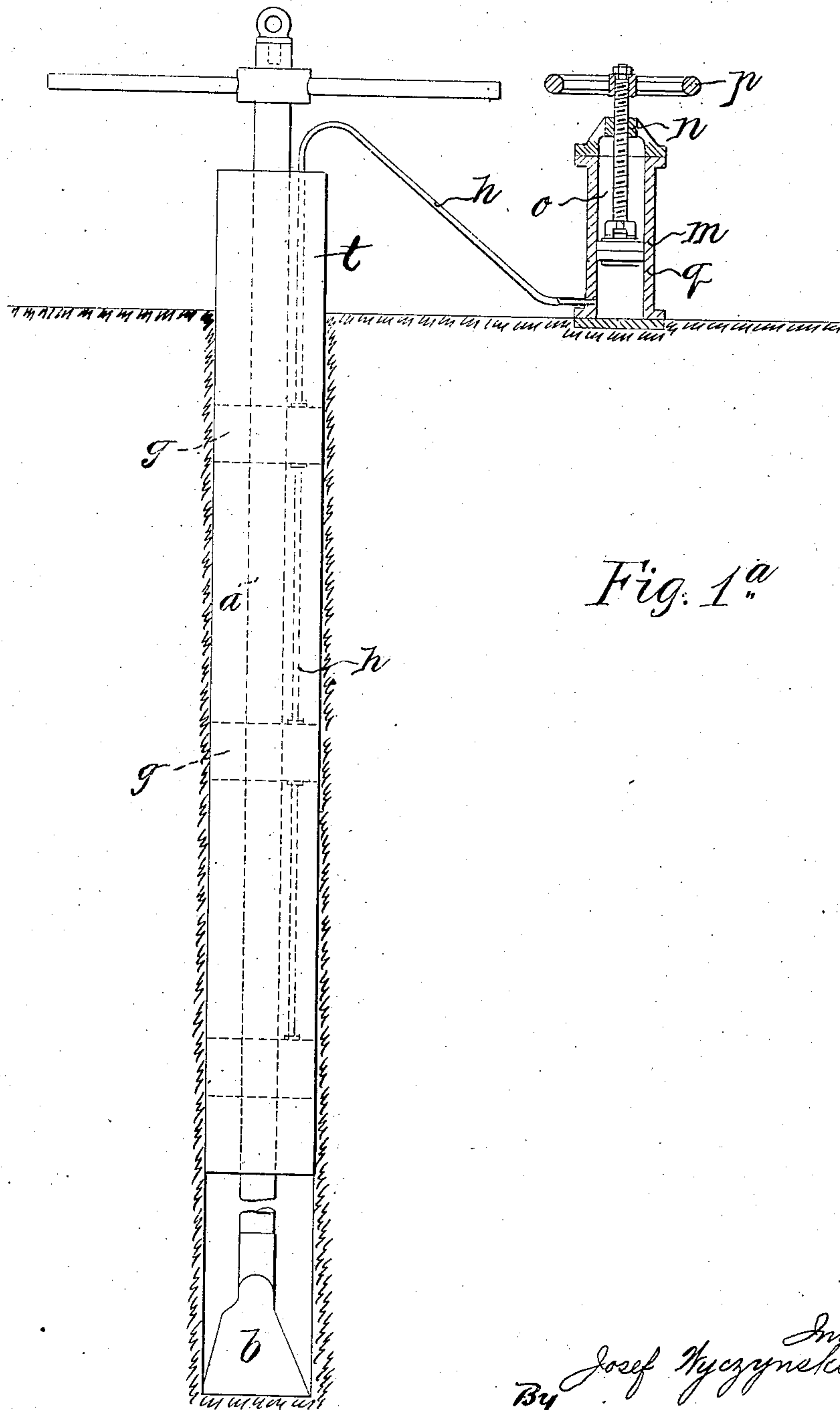


Fig. 1a

Witnesses:  
Attest  
C. H. Sommer

Inventor:  
By Josef Wyczynski  
Attest



# UNITED STATES PATENT OFFICE.

JOSEF WYCZYNSKI, OF TRUSKARVIEC, NEAR DROHOBYCZ, AUSTRIA-HUNGARY.

CENTERING AND GUIDING DEVICE FOR DEEP-BORING APPARATUS WITH ECCENTRIC BORING-TOOL.

SPECIFICATION forming part of Letters Patent No. 712,887, dated November 4, 1902.

Application filed May 9, 1900. Serial No. 16,080. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEF WYCZYNSKI, a subject of the Emperor of Austria-Hungary, residing at Truskarviec, near Drohobycz, in the Province of Galicia, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Centering and Guiding Devices for Deep-Boring Apparatus with Eccentric Boring-Tool; 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 letters of reference marked thereon, which form a part of this specification.

This invention has relation to well or shaft boring appliances, and more particularly to that type in which the tool is so constructed that the diameter of the well or shaft will be greater than that of the bore tube or casing with a view to facilitating the lining of the well or shaft.

My invention has for its object the provision of means for centering the boring-tool, the provision of means for removing said centering device or devices with the tool and the rod or rods connected therewith, and the provision of means for moving the movable gripping-jaws of the centering devices simultaneously, or substantially so, into engagement with the bore tube or casing.

That my invention may be fully understood, I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a fragmentary vertical sectional view of so much of a boring apparatus as will be necessary to an understanding of my invention. Fig. 1<sup>a</sup> shows a side elevation of a bore-tube, showing the boring mechanism in dotted lines, and a vertical sectional view of a cylinder for compressing a fluid through the medium of which the movable jaw of the centering device or devices is moved into engagement with the bore tube or casing. Fig. 2 is a fragmentary sectional view on line A A of Fig. 3, which latter is a section on line B B of said Fig. 2; and Fig. 4 is a part plan and part section on line B B of Fig. 2, showing

the movable jaw of a centering device retracted.

Referring to Figs. 1, 2, 3, and 4, *t* indicates the bore tube or casing, hereinafter referred to as the "bore-tube," which has its inner periphery serrated or corrugated circumferentially, as shown at *t'*, and *d* indicates the tool-carrier or lower section of the bore-rod carrying the boring-tool *b*. As shown in Fig. 1, one half of the effective or boring edge of the tool *b* is of greater and the other half of less radius than the internal radius of the bore-tube, so that the diameter of the bore will be slightly greater than the external diameter of said tube, whereby the feeding down of the latter is greatly facilitated.

The guide and centering devices *c*, of which I have shown two, though a greater number may be or are used, according to the depth of the well or shaft, comprise a guide-bearing *d*, in which the tool-carrier or boring-rod, or sections thereof, and hereinafter generically referred to as the "boring-rod," is free to revolve and slide up and down. The said bearing *c* has secured thereto or preferably formed integral therewith, as shown, a sectoral gripping-jaw *g* of the same radius as the internal radius of the bore-tube and whose outer or gripping face is serrated or corrugated to engage or mesh with the circumferential serrations or corrugations *t'* on the inner periphery of the bore-tube *t*. Diametrically opposite the rigid jaw *g* the bearing *c* has formed thereon a sectoral chambered member *g'* of less radius than the internal radius of the bore-tube, in the chamber *e* of which is fitted to slide fluid-tight, or substantially so, a sectoral gripping-jaw *f*, whose outer face is likewise provided with serrations or corrugations adapted to engage or mesh with the serrations or corrugations *t'* in bore-tube *t*.

The chambers *e* in the members *g'* of the guide and centering devices *c* are connected together by pipes *h*, the chamber of the uppermost centering device being connected by a pipe *h'* with any suitable fluid-compressor or device for supplying a fluid under pressure to said chambers. In Fig. 1, I have shown a cylinder *m* open at its upper end, in which works a piston *q*, carried by a screw-spindle *o*, in



that works in a threaded bearing *n* in the upper cylinder-head and carries a hand-wheel *p*.

When the boring apparatus is in operation, the chambers *e*, pipes *h* and *h'*, and part of the cylinder *m* are filled with a compressible fluid, as air or other gas, for instance, or with a non-compressible fluid, as water, so that when the piston *q* is screwed into the cylinder the pressure on the movable jaws *f* will force them against the stress of the retracting-springs *i* into engagement with the bore-tube, thereby centering the bore-rod and tool and at the same time guiding the said bore-rod in its rotary and vertical movements. Should it be desirable or necessary to hoist the bore-rod and centering devices out of the bore-tube *t*, the pressure on the jaws *f* can be relieved by simply screwing the piston *q* in cylinder *m* in a reverse direction, as will be readily understood, and said jaws will be automatically retracted by the springs *i*.

Of course any other means may be employed for moving the jaws *f* into engagement with the bore-tube *t* by the pressure of a fluid and for relieving the pressure on said jaws.

With a view to affording means for the ready removal of the diluting-water and the solid spoils through the bore-tube the jaws *g* of the centering devices have vertical passages formed therein, similar passages being formed along the bearing *d* by bracing or strengthening webs, which connect the rigid jaw *g* to the sectoral member *g'*.

In order that the bore-rod and tool, together with the centering devices, may be hoisted out of the bore-tube *t*, it is necessary that the half of said tool which is of greater radius than the internal radius of the bore-tube be in line with the radius of the rigid jaw *g*, so that when the movable jaws are retracted the bore-rod and centering devices may have room to move or swing laterally in the bore-tube, and thereby move the point of the aforesaid half of the edge of greater radius than the inner radius of the bore-tube clear of the inner wall of the latter. With a view to avoid the necessity of rotating the bore-rod to bring the tool into the desired position by the means usually provided for this purpose I have provided means whereby this is automatically effected whenever the bore-rod is raised sufficiently. To this end the lowermost centering device has secured to its under side a sleeve or tube *k*, cut away bias longitudinally or at an angle to its axis, with the point downward, through which tube the bore-rod *a* passes freely, and said rod is provided with a corresponding projection *l*, tapering upwardly and engaging one or the other inclined edge of the tube, whereby said rod is rotated and the tool always brought into the required position. This done, the movable gripping-jaws are relieved of pressure, and the bore-rod and guide and centering devices can be hoisted out of the bore-tube, as will be readily understood.

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

1. In a well or shaft boring apparatus, the combination with the bore tube or casing provided with an internal circumferential gripping-face and the tool-rod; of a guide and centering device comprising a guide-bearing for said rod having formed thereon a sectoral rigid gripping-jaw of the same radius as the internal radius of the gripping-face of the bore-tube, and carrying a sectoral radially-sliding gripping-jaw diametrically opposite said rigid jaw and means for moving the sliding jaw into and out of engagement with the internal gripping-face of the bore-tube, for the purpose set forth.

2. In a well or shaft boring apparatus, the combination with the bore tube or casing provided with an internal circumferential gripping-face and the tool-rod; of a guide and centering device comprising a guide-bearing for said rod having formed thereon a sectoral rigid gripping-jaw of the same radius as the internal radius of the gripping-face of the bore-tube and carrying a sectoral radially-sliding gripping-jaw diametrically opposite said rigid jaw, means for projecting the sliding jaw into engagement with the gripping-face of the bore-tube and means operating automatically to move said jaw out of engagement with said tube, for the purpose set forth.

3. In a well or shaft boring apparatus, the combination with the bore tube or casing provided with an internal peripheral gripping-face and the tool-rod; of a guide and centering device, comprising a bearing for the tool-rod, provided with a rigid segmental gripping-jaw of the same radius as the internal radius of the bore tube or casing and with a radially-movable jaw working in a pressure-chamber of said bearing, and means for supplying a fluid under pressure to said chamber to project said jaw into engagement with the aforesaid gripping-face of the bore tube or casing, for the purposes set forth.

4. In a well or shaft boring apparatus, the combination with the bore tube or casing provided with an internal peripheral gripping-face, and the tool-rod; of a guide and centering device comprising a bearing for the tool-rod, provided with a rigid segmental gripping-jaw of the same radius as the internal radius of the bore tube or casing and with a radially-movable jaw working in a pressure-chamber of said bearing, means for supplying a fluid under pressure to said chamber to project said jaw into engagement with the aforesaid gripping-face of the bore tube or casing and means operating automatically to retract the jaw when relieved of pressure, for the purposes set forth.

5. In a well or shaft boring apparatus, the combination with the bore tube or casing provided internally with peripheral gripping-faces, and the tool or bore rod; of a plurality of guide and centering devices at different



elevations, each comprising a bearing for the tool or bore rod, provided with a sectoral gripping-jaw of the same radius as the internal radius of said bore tube or casing and diametrically opposite with a sectoral gripping-jaw movable in a pressure-chamber on said bearing, and means for supplying pressure simultaneously or substantially so to the several chambers to project the sliding jaws into engagement with the bore-tube, for the purposes set forth.

6. In a well or shaft boring apparatus, the combination with the bore tube or casing provided internally with peripheral gripping-faces, and the tool-rod; of a plurality of guide and centering devices at different elevations, each comprising a bearing for the tool-rod, provided with a rigid sectoral gripping-jaw of the same radius as the internal radius of said bore tube or casing and diametrically opposite with a radially-movable sectoral gripping-jaw working in a pressure-chamber on said bearing, pipe connections between the several chambers, and a pipe from the upper chamber to the surface for supplying fluid under pressure to the several chambers to project the movable jaws into engagement with the aforesaid gripping-surfaces, for the purposes set forth.

7. In a well or shaft boring apparatus, the combination with the bore tube or casing provided with internal circumferential corrugations or screw-threads, and the tool-rod; of a guide and centering device comprising a correspondingly corrugated or threaded sector-shaped gripping-jaw of the same radius as the internal radius of said bore tube or casing and provided with an axial bearing for the tool-rod, and a similar gripping-jaw having sliding motion in guides in said axial bearing,

means for moving the sliding jaw into engagement with the gripping-face of the bore-tube and means operating automatically to move said sliding jaw out of engagement with said gripping-face, for the purpose set forth.

8. In a well or shaft boring apparatus, the combination with the bore tube or casing provided with internal circumferential gripping-faces, the tool-rod provided with a spiral rib *l*, and the boring-tool having one half of its boring or cutting edge of less, and the other half of greater radius than the internal radius of said tube or casing; of a guide and centering device comprising a sector-shaped gripping-jaw of the same radius as the internal radius of the bore tube or casing and provided with an axial bearing for the tool-rod extended beyond said jaw and cut away on a bevel to engage the aforesaid rib *l* on said tool-rod, said parts so arranged that when the tool-rod is lifted one or the other edge of the beveled portion of the bearing extension will engage the rib *l* and revolve the tool-rod and position the tool with its greater radius in line with the aforesaid gripping-jaw, a second gripping-jaw having radial motion toward and from the bearing of the first-named jaw, means controllable from above ground to project the movable jaw into engagement with the gripping-face of the bore tube or casing, and means for automatically retracting said jaw, for the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOSEF WYCZYNSKI.

Witnesses:

JOSEF RUBRESCH,  
AUGUST FUGGER.