

No. 869,861.

PATENTED OCT. 29, 1907.

J. L. ALSPAUGH.
TOOL FOR REMOVING BUSHINGS.
APPLICATION FILED MAR. 5, 1907.

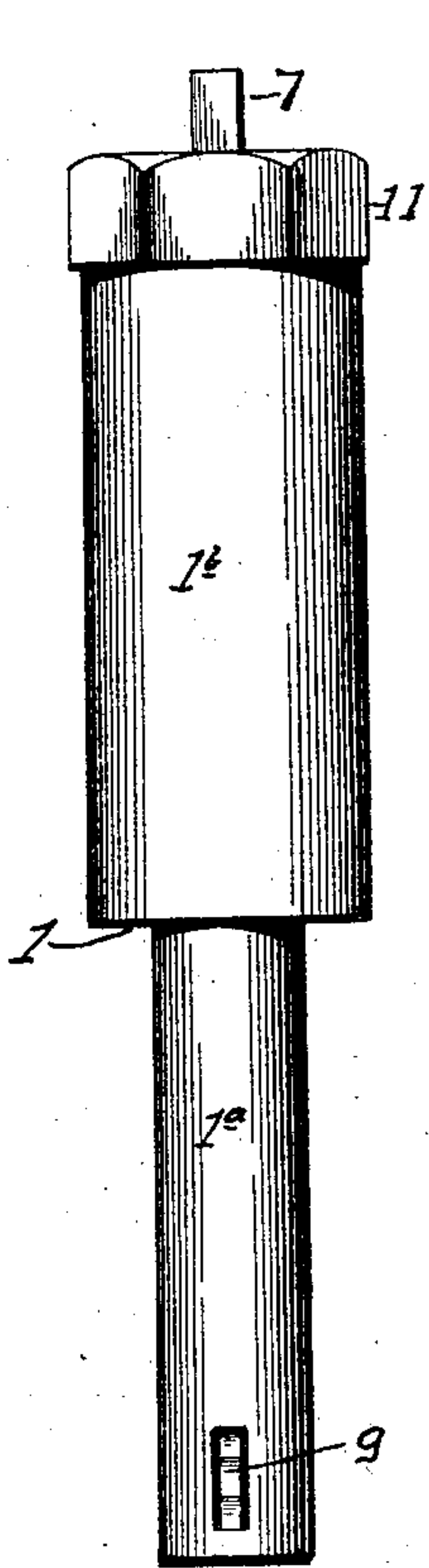


Fig. 1.

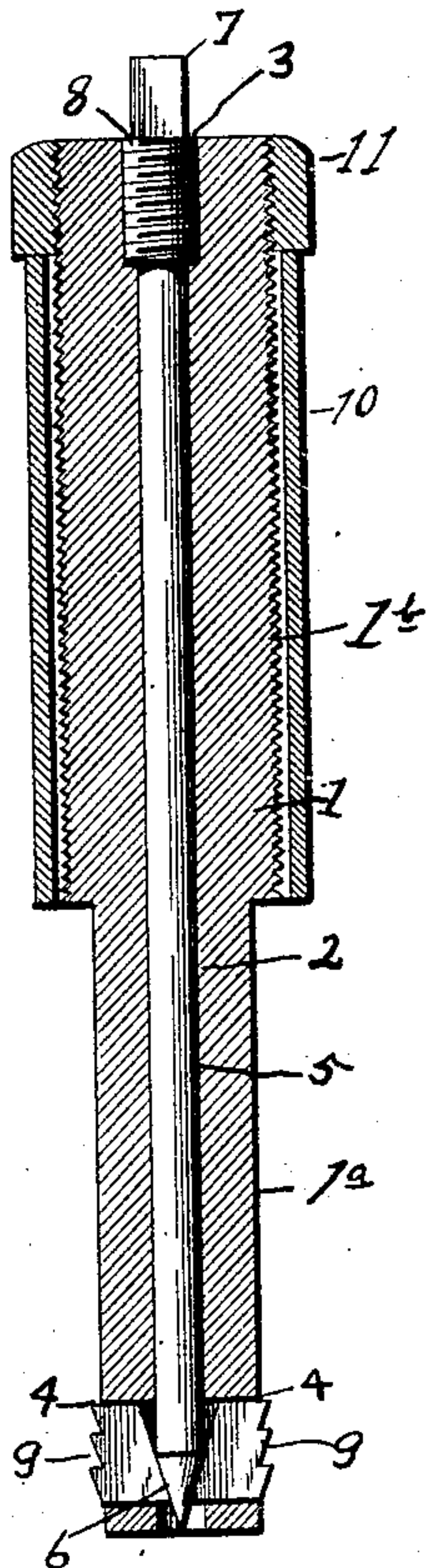


Fig. 2.

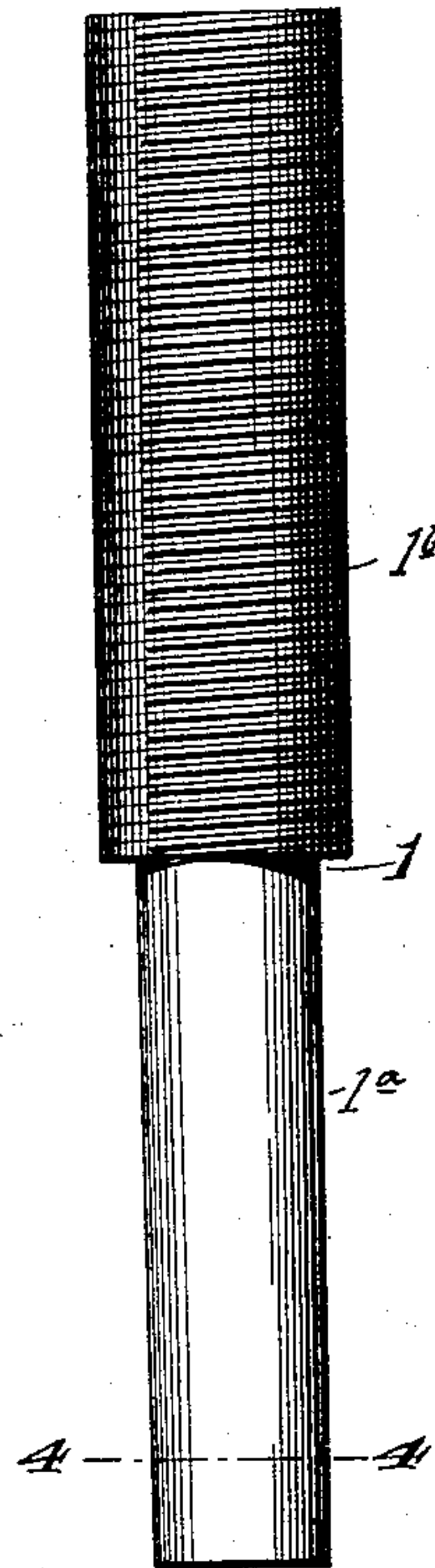
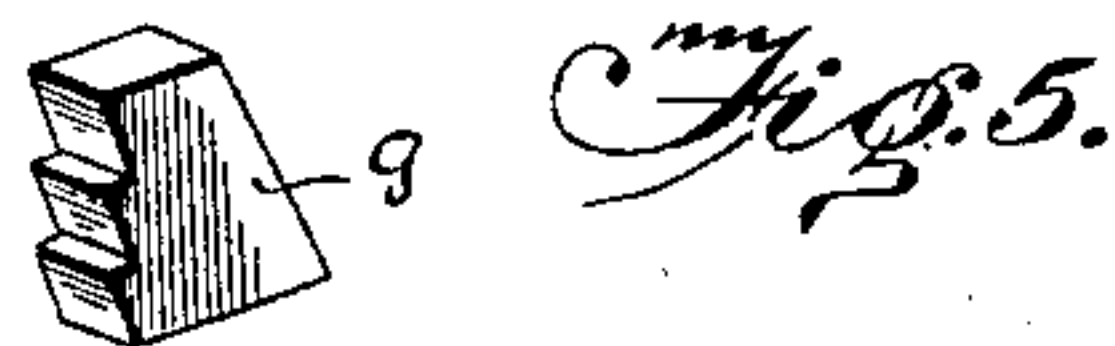
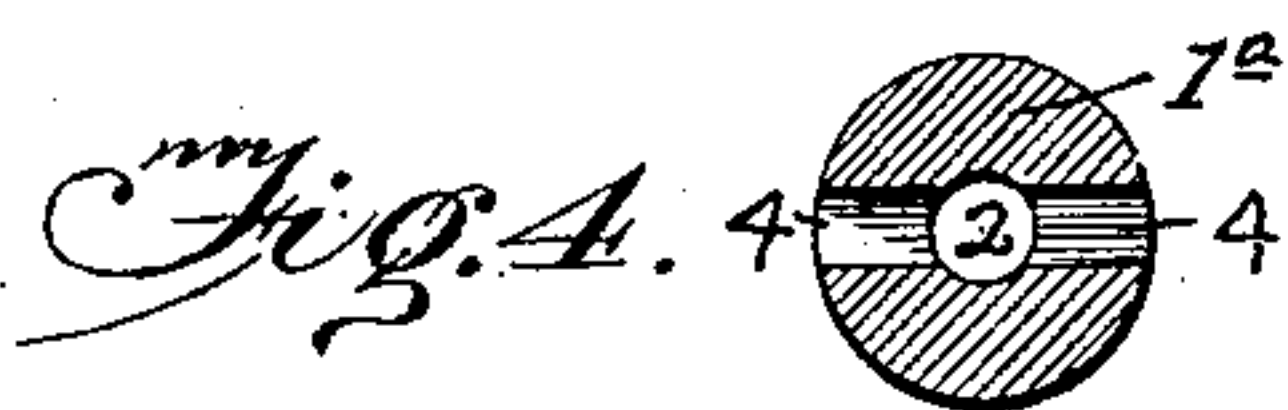


Fig. 3.



Witnesses:
J. H. Harrison
G. H. Harrison

Inventor:
Jesse L. Alspaugh
by Edward A. Lawrence,
his Attorney.

UNITED STATES PATENT OFFICE.

JESSE L. ALSPAUGH, OF GEORGETOWN, COLORADO.

TOOL FOR REMOVING BUSHINGS.

No. 869,861.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed March 5, 1907. Serial No. 360,797.

To all whom it may concern:

Be it known that I, JESSE L. ALSPAUGH, a citizen of the United States, residing at Georgetown, in the county of Clear Creek and the State of Colorado, have invented
5 a new and useful Chuck-Bushing Machine for Removing Worn-Out Chuck-Bushings from Compressed-Air Rock-Drilling Machines.

My invention consists of certain new and useful improvements in devices intended for the removal of
10 chuck bushings and similar purposes. Devices for these purposes now in use are uniformly complicated and therefore costly and tend to get out of repair and at the same time are unsatisfactory and unreliable in operation.

15 My device is very simple in construction and is therefore of small first cost and less likely to get out of order. Its action is positive and effective in obtaining the desired results.

Generally speaking, my invention consists of a cylindrical member, one portion of which is of less diameter to be inserted into the chuck and the other of greater diameter and exteriorly threaded. In the central bore of said member is located a spindle capable of longitudinal movement by its threaded engagement with a
20 portion of the bore and operating to expand, by means of its tapered or pointed lower extremity, the engaging dogs carried in slots in the said cylindrical member. A sleeve loosely surrounds the larger threaded portion of the member and is adapted to be forced down against the
25 machine or chuck, from which the bushing is to be removed, by means of a force nut bearing against the outer end of said sleeve and engaging the exterior threads on said member. The forcing down of said sleeve draws the member outwardly, bringing with it
30 the bushing firmly gripped by the engaging dogs.

I also show a novel arrangement and construction of parts which will appear from the following description.

In the accompanying drawings, Figure 1 is a side elevation of my device complete; Fig. 2 is a vertical
40 cross section thereof taken at right angles to Fig. 1 and showing the dogs and spindle in full lines for the sake of clearness; Fig. 3 is a side elevation, taken at right angles to Fig. 1 and showing the outer sleeve and force nut removed for the sake of clearness; Fig. 4 is a cross
45 section along the line 4—4 in Fig. 3, the dogs being omitted for the sake of clearness, and Fig. 5 is a perspective of the form of dog preferably used.

The following is a description of the drawings:—

1 is the central stock or cylindrical member whose
50 lower portion, 1^a, is of sufficiently small diameter to enter the chuck or other construction from which the bushing is to be removed. Its upper or outer portion, 1^b, is of greater diameter and exteriorly threaded for purposes to be described.

2 is the central bore of stock 1 running from end to
end and at its upper extremity counter sunk to a larger diameter and interiorly threaded as at 3.

4, 4, represent two or more vertical slots through the wall of stock 1 adjacent to its lower end and communicating with the central bore 2. In said central bore 2 is
60 located a spindle 5 whose lower end is tapered or pointed as at 6 and whose upper end is squared for the engagement of a wrench or other tool, as at 7. Adjacent to its upper end, the diameter of said spindle is enlarged to provide a threaded section 8 adapted to fit into and
65 engage the threads in the threaded portion 3 of the bore 2. It is thus evident that a rotation of the spindle 5 by means of a wrench will move said spindle longitudinally in said bore 2.

9—9 represent two or more dogs, preferably provided
70 with serrated biting surfaces as shown, adapted to be seated in slots 4—4 and, when engagement with a bushing is desired, to be forced outwardly by the downward movement between said dogs of the pointed end 6 of
75 spindle 5. The rear edges of said dogs are preferably inclined upwardly as shown to facilitate their movement and assist the pointed end of the spindle, by giving a firm and even bearing between the spindle and dogs.

10 is a sleeve fitting loosely over the threaded portion
80 1^b of stock 1 and adapted to bear with its lower end against the chuck or other construction from which the bushing is to be drawn.

11 is a force nut adapted to screw down on portion 1^b
of the stock against the outer end of sleeve 10, thus,
85 owing to the immobility of said sleeve, drawing the stock outwardly and bringing with it the bushing gripped by dogs 9—9.

The operation of my invention is as follows:—The force nut 11 and sleeve are first preferably removed
90 from stock 1. The lower end of said stock is then inserted into the chuck or other construction from which the bushing is to be removed, the extremity of said stock extending into the bore of the bushing. The spindle 5 is now moved inwardly or downwardly by rotating said spindle by means of a wrench engaging the squared end 7 of said spindle, thus forcing the pointed
95 end 6 of said spindle down between the inclined rear edges of dogs 9—9, forcing said dogs outwardly into the desired firm engagement with the bushing. The sleeve
100 10 is now slipped down over portion 1^b of stock 1, its lower end resting against the chuck or other construction from which the bushing is to be removed. The force nut 11 is now adjusted on the threads of portion 1^b
105 and by means of a wrench or other tool screwed downwardly on said portion 1^b, thus, because of the inability of the sleeve 10 to advance, drawing the stock 1 bodily, outwardly away from the chuck. However, as the

bushing is now firmly gripped by the dogs, said bushing travels outwardly with said stock and is thus drawn out of the chuck. After the force nut 11 and spindle 5 have been unscrewed the device is ready for another operation as above.

It will be seen from the above that, although my tool is light and portable, a firm and sufficiently effective grip is readily obtained on the bushing and, once said grip is obtained, the bushing may readily be removed by screwing up the force nut. The degree to which the dogs 9—9 are to be advanced outwardly will of course depend upon the diameter of the bushing, making the tool adjustable to use within wide limits.

What I desire to claim is:—

1. In a tool for the removal of bushings, a stock having a central bore and adapted to be inserted into said bushing, dogs seated in recesses in said stock, a spindle capable of longitudinal movement in said bore and having a pointed end adapted to engage said dogs and force them outwardly into firm engagement with the bushing and means for withdrawing said stock from the chuck.

2. In a tool for the removal of bushings, a stock having a central bore, a spindle located within said bore and having a threaded section of larger diameter adjacent to the outer end thereof, a countersunk portion of said bore adapted to be engaged by said threaded section of said spindle whereby the rotation of said spindle acts to move the same longitudinally in said bore, dogs seated in recesses adjacent to the end of said stock, a pointed end to said spindle adapted to force said dogs outwardly into firm engagement with the bushing to be removed and means for imparting longitudinal movement to said stock whereby said bushing is drawn out of said chuck, substantially as described.

3. In a tool for the removal of bushings, a stock having a central bore and adapted to be partially inserted in said bushing and its chuck, a spindle located within said bore and having a threaded section of larger diameter adjacent to the outer end thereof, a countersunk portion of said bore adapted to be engaged by said threaded section of

said spindle whereby the rotation of said spindle acts to move the same longitudinally in said bore, dogs having inclined inner faces seated in recesses adjacent to the end of said stock, a pointed end to said spindle adapted by its downwardly motion to force said dogs outwardly into firm engagement with said bushing by contact with the inner inclined faces thereof and means for withdrawing said stock with the bushing attached thereto, substantially as described.

4. In a tool for the removal of bushings, a stock having a central bore and adapted to be inserted into said bushing, dogs seated in recesses in said stock, a spindle capable of longitudinal movement in said bore and having a pointed end adapted to engage said dogs and force them outwardly into firm engagement with the bushing, a sleeve adapted to be slipped over the outer portion of said stock and bear against the chuck or other construction from which the bushing is to be removed and a force nut adapted to be screwed down on said stock against the outer end of said sleeve whereby said stock is drawn outwardly with said bushing attached, substantially as described.

5. In a tool for the removal of bushings, a stock having a central bore and adapted to be inserted into said bushing, dogs seated in recesses in said stock and having inclined rear faces, a spindle located within said bore and having a pointed lower end adapted to be forced down between said dogs to force the same outwardly into close engagement with the bushing to be removed, a counter sunk and threaded portion of said bore, a portion of said spindle of enlarged diameter and threaded to engage said countersunk and threaded portion of said bore whereby the rotation of said spindle moves the same longitudinally in said bore, a sleeve adapted to be slipped over the protruding end of said stock and bear against the chuck or other construction in which said bushing is held and a force nut adapted to be screwed down on the outer end of said stock against said sleeve whereby said stock is drawn outwardly with the bushing secured thereto, substantially as described.

JESSE L. ALSPAUGH.

Witnesses:

B. J. SUTTON,
JAS. ALSPAUGH.