S. A. TITUS.

PNEUMATIC DRILL.

APPLICATION FILED DEC. 31, 1908.

955,924.

Patented Apr. 26, 1910.

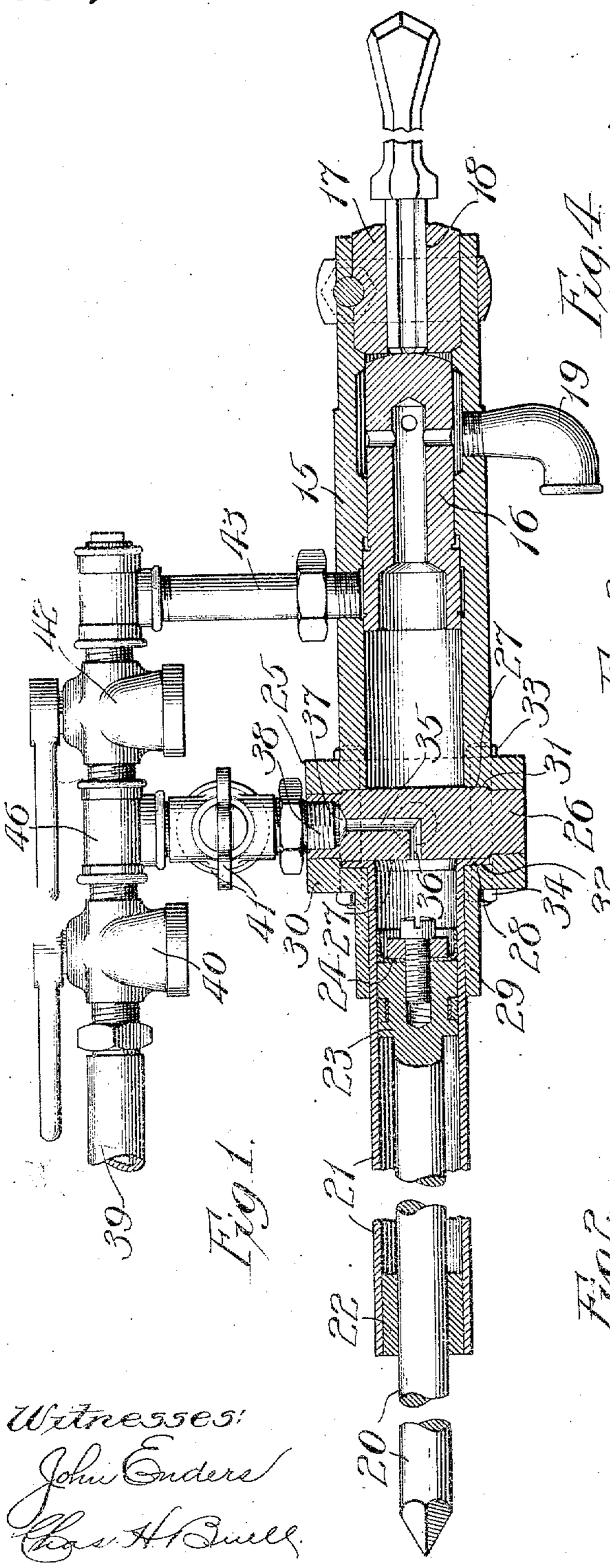

Fig. 1.

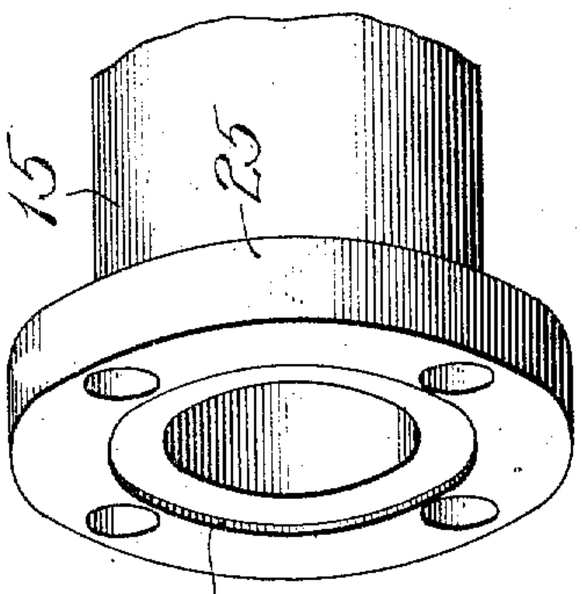

Fig. 4.

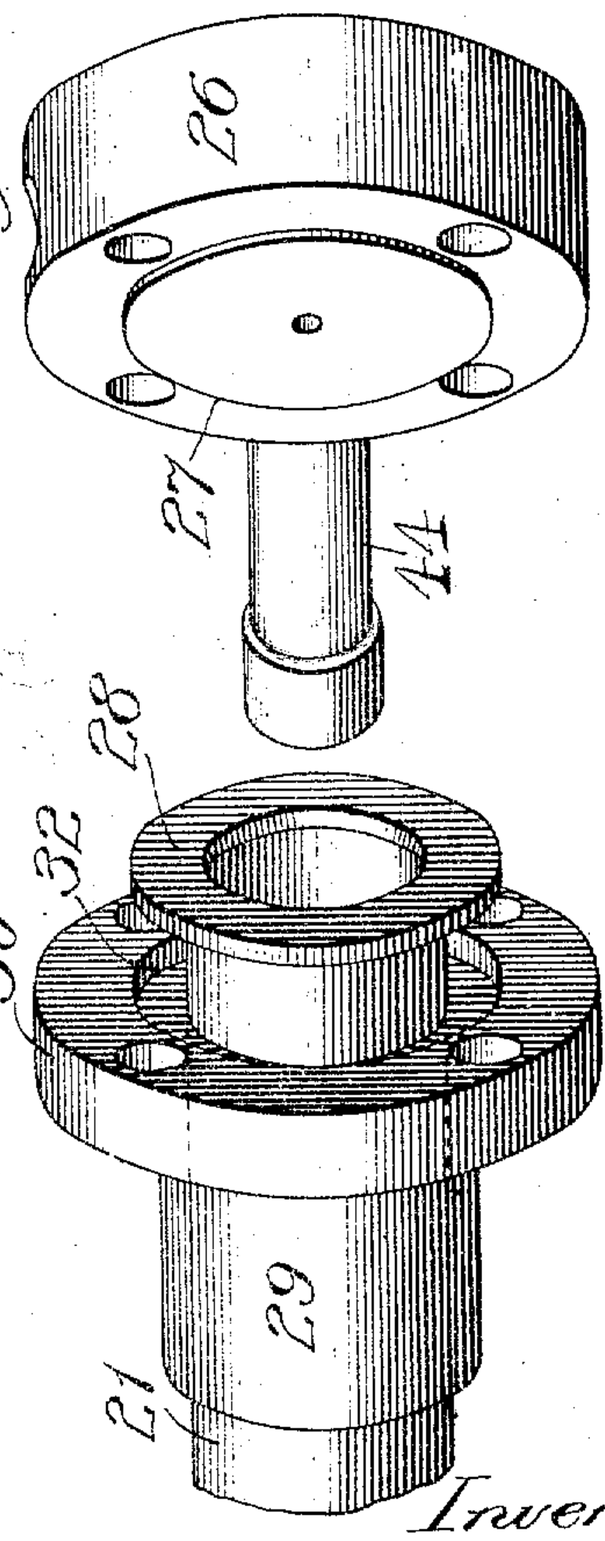

Fig. 3.

Fig. 2.

Witnesses:

John Enders

Chas. H. Bull.

Inventor:

Samuel A. Titus.

By Sheridan & Wilkinson.

Attys.

UNITED STATES PATENT OFFICE.

SAMUEL A. TITUS, OF CANANEA, MEXICO.

PNEUMATIC DRILL.

955,924. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed December 31, 1908. Serial No. 470,235.

To all whom it may concern:

Be it known that I, SAMUEL A. TITUS, a citizen of the United States, residing at Cananea, in the country of Mexico, have invented certain new and useful Improvements in Pneumatic Drills, of which the following is a specification.

The principal object of my invention is to provide a new and improved drill of the type intended to be actuated by the pressure of an elastic fluid.

A further object of my invention is to provide a drill in which the pressure of an elastic fluid, such as air, is used both for the purpose of reciprocating the drill hammer and also for feeding the drill up against its work.

Still another object of my invention is to provide a stoping drill having a fluid pressure actuated telescope joint for feeding the drill up to its work.

My invention resides partly in certain details of construction that will become apparent on reading the following specification and claims, taken in connection with the accompanying drawings, in which—

Figure 1 is a longitudinal section of the drill, and Fig. 2 is a perspective view of the end of a pressure feed pipe which forms a part of the device. Fig. 3 is a perspective view of a disk which normally lies adjacent to the end of the pressure feed pipe shown in Fig. 2. Fig. 4 is the end of the piston cylinder which normally lies adjacent to the disk shown in Fig. 3.

In the particular embodiment of my invention which I have chosen to illustrate in the accompanying drawings, the drill comprises a cylinder 15 having a single acting piston and hammer 16 therein. At the end of the cylinder 15 is an inside bushing 17, through the hole 18 of which the shank of the drill is adapted to be introduced, so as to receive hammer blows from the piston hammer 16. The air exhaust outlet is indicated by the reference numeral 19. The arrangement of the air passages by which reciprocation of the piston 16 is effected forms no part of my present invention, and inasmuch as it is old and well known in the art I do not enter upon a description of it here. At the opposite end of the structure is a rod 20 having a head 23 with packing 24 on the end thereof. This packing 24 makes a tight fit with the inside of the pipe 21, within which is the head 23. An inside ring 22 at the end of the pipe 21 forms a stop to prevent complete withdrawal of the shaft 20 from the pipe 21. It will be observed that the pipe 20 and shaft 21 are united by the telescope joint. The remote end of the shaft 20 is adapted to engage an abutment, and then the drill will be fed to its work by extension of the described telescope joint.

At its end the cylinder 15 terminates in a wide thick flange 25 having a shallow annular groove 31 cut in its face. Lying adjacent to this flange 25 is the disk 26 having a slightly projecting shoulder 27 fitting with the said annular groove 31. On its opposite face this disk 26 has a similar shoulder 27. The adjacent end of the long pipe 21 is turned in an outwardly directed flange 28, which lies against the said shoulder 27. The slidable sleeve 29 surrounds the pipe 21 and ends in an outwardly directed flange 30, matching the flange 25. This flange 30 has an annular groove 32 of sufficient depth to accommodate the pipe flange 28 and the adjacent shoulder 27. The bolts 33 and the corresponding nuts 34 serve to clamp the disk 26 tightly between the two opposed flanges 25 and 30, and at the same time to clamp the pipe flange 28 between the sleeve 29 and the disk 26. A hole 35 is drilled radially into the disk to the center thereof, where it is met by the axial hole 38, the two together forming a duct which leads from the periphery of the disk to the side face thereof, connecting with the pipe 21. On the periphery of the disk this duct ends in a screw threaded socket 37, in which is fitted the pipe 38.

A compressed air supply pipe 39 is controlled by the valve 40, beyond which point, at 46, the pipe branches, one branch controlled by the valve 41 leading to the duct 35—36 and the other branch controlled by the valve 42 leading through the pipe 43 to the piston cylinder 15.

A short length of pipe 44 is screwed radially into the periphery of the disk 26; this is to serve as a handle for manipulating the drill.

The drill shank having been introduced in the hole 18 in the bushing 17 and the remote end of the shaft 20 having been placed against an appropriate abutment the valves 40—41 may be opened. This will permit air to pass through the pipe 39 and duct 35—36 into the pipe 21, where its pressure acting between the face of the disk 26 and the head

23 will push these members apart, thus feeding the drill up against its work. The piston hammer may be set in operation by opening the valve 42, which will admit air from the feed pipe 39 through the branch 43 to the cylinder 15, thus reciprocating the piston 16 in the usual manner. If at any time it is desired to stop the hammer without releasing the pressure feed thereof, this may be accomplished by closing the valve 42. If, on the other hand, it is desired to release the pressure feed without stopping the reciprocation of the hammer, this may be accomplished by closing the valve 41.

The structure of the disk 26 and its associated elements constitute an important feature of my invention. It will be seen that the only screw threads employed in this joint about the disk 26 are those on the bolts 33 and nuts 34, which of course can be very readily replaced if they become damaged. The bolts 33 are all at a considerable distance from the axis of the drill, and therefore they give a strong firm joint bracing the structure firmly against side thrusts at intermediate points. Whenever it is desired to dismount the drill in order to obtain access to the cylinder 15 or the pipe 21 or both of these chambers, this can readily be accomplished by removing the nuts 34 and withdrawing the bolts 33. Thereupon the sleeve 29 may be slipped back upon the pipe 21 as indicated in Fig. 2 and ready access may be had to all the parts. In this way the drill may be opened up so as to remove the piston 16 if that is desired.

It will be seen that I have invented an improved pneumatic drill in which the parts are assembled in a simple and durable manner, and in such a way that the drill can be conveniently taken apart and put together by an unskilled person whenever desired. Moreover, my improved drill affords convenient independent controlling means for the piston driving cylinder and the pressure feed.

I claim:—

1. In a pneumatic drill, a cylinder having a reciprocatory piston therein, a flange on one end of said cylinder, a disk across the end of the cylinder adjacent to said flange, a pressure feed pipe having a flange at its end adjacent to the other side of the disk, a sleeve surrounding said pipe, a flange on said sleeve adapted to overlie the flange on the pipe, and means to clamp the said parts together.

2. In a pneumatic drill, a cylinder having a reciprocatory piston therein, a flange on the end of said cylinder, a disk adjacent to said flange, a pressure feed pipe having a small flange at its end adjacent to the other side of the disk, a sleeve on said pipe having a large flange on one end thereof, said large flange having an annular groove in which the said small flange fits, and means to clamp the said parts together.

3. In a pneumatic drill, a cylinder having a reciprocatory piston therein, a flange on the end of said cylinder, a disk adjacent to said flange, a pressure feed pipe having a small flange at its end adjacent to the other side of the disk, a shoulder on the face of the disk adjacent to said small flange and of the same size, a sleeve surrounding said pipe, a large flange on one end of said sleeve, said large flange having an annular groove adapted to receive the said small flange and shoulder, and means to clamp the said parts together.

4. In a pneumatic drill, a cylinder having a reciprocatory piston therein, a disk across the end of the cylinder, a pressure feed pipe having a flange at its end adjacent the other side of the disk, a ring around said pipe beyond the flange thereon, and means to clamp the ring to the disk.

5. In a pneumatic drill, a cylinder having a reciprocatory piston therein, a flange on one end of said cylinder, a disk across the end of said cylinder adjacent said flange, a pressure feed pipe on the other side of the disk, a flange associated with the end of said pressure feed pipe, and longitudinal bolts through the said flanges and the edge of the disk lying between the flanges.

6. In a pneumatic drill, a cylinder having a reciprocatory piston therein, a disk across the end of the cylinder, a pressure feed pipe having a flange at its end adjacent the other side of the disk, a ring around said pipe beyond the flange thereon, and bolts through the ring, the edge of the disk and the flange on the end of the pressure feed pipe.

In testimony whereof, I have subscribed my name.

SAMUEL A. TITUS.

Witnesses:

BLAINE BOWMAN,

JAS. R. CONTRERAS.