

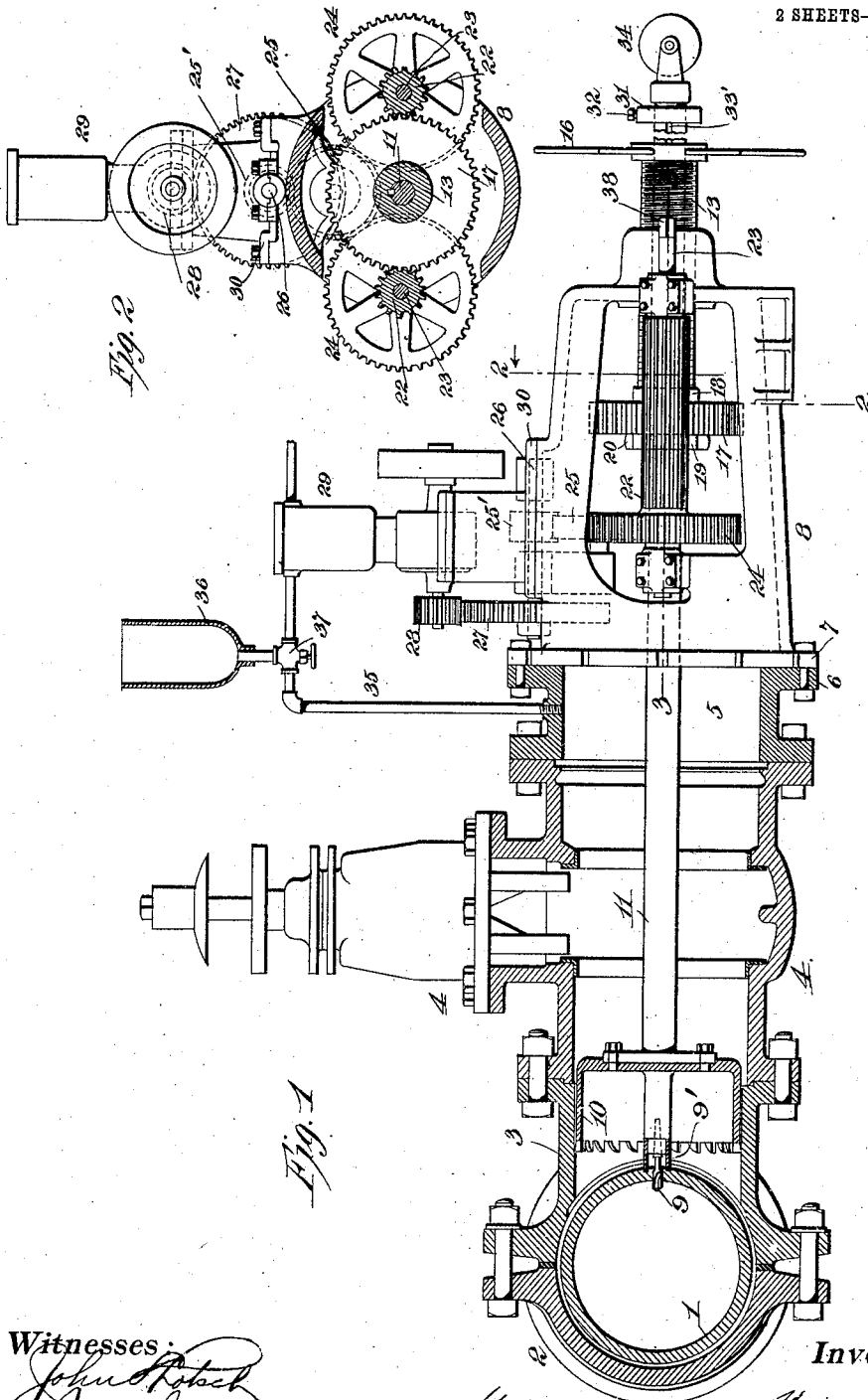
No. 845,830.

PATENTED MAR. 5, 1907.

W. H. VAN WINKLE.
APPARATUS FOR TAPPING MAINS.

APPLICATION FILED OCT. 30, 1905.

2 SHEETS—SHEET 1.



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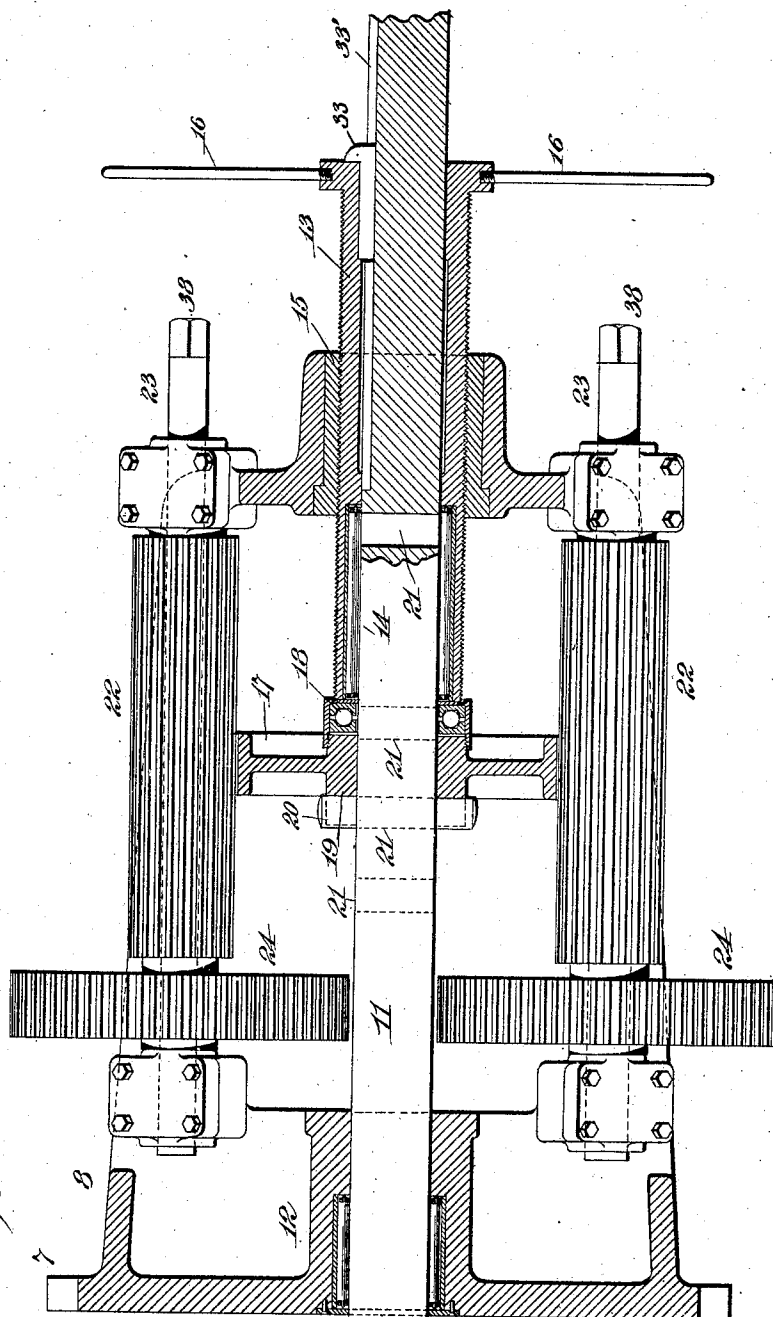


Fig. 3

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UNITED STATES PATENT OFFICE.

WALTER H. VAN WINKLE, OF NEWARK, NEW JERSEY.

APPARATUS FOR TAPPING MAINS.

No. 845,830.

Specification of Letters Patent.

Patented March 5, 1907.

Application filed October 30, 1905. Serial No. 284,942.

To all whom it may concern:

Be it known that I, WALTER H. VAN WINKLE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Apparatus for Tapping Mains, of which the following is a description.

The object of the present invention is to provide a machine for tapping water-mains and the like and make branch connections therewith without withdrawing the pressure from such mains, which will be more effective and economical in use. I attain these objects by the mechanism in the accompanying illustration, in which—

Figure 1 is a side elevation, partly in longitudinal section, of the complete machine embodying the invention. Fig. 2 is a sectional view thereof, taken on the lines 2 2 of Fig. 1 and looking in the direction of the arrow. Fig. 3 is a large horizontal section taken on the lines 3 3 of Fig. 1.

In all of the views like parts are designated by the same reference characters.

1 is the main which it is desired to tap without removing pressure from the fluid thereof.

2 is the sleeve formed of two parts clamped around the main in the desired position and having a branch 3. Means is provided for preventing leakage at the joints between the grooves of the surfaces abutting against the two. A convenient and satisfactory means for doing this is disclosed in my copending application for patent filed October 30, 1905, Serial No. 284,943.

To the branch 3 is bolted or otherwise secured the valve-casing 4, having a valve therein. To the valve-casing 4 is attached an extension-coupling 5. This coupling is provided with a flange 6, which is bolted to a corresponding flange 7 on the frame 8 of the drilling-machine. The extension-coupling 5 may be formed in different sizes to accommodate different-sized mains. By making the flange 6 of such coupling of the same size as the flange 7 of the drilling-machine one size of drilling-machine may be employed to act with different sizes of mains. The drilling-machine comprises a pilot-drill 9, a somewhat larger hollow drill 9', and a saw 10, the drill 9' being for the purpose of first making an incision into the main to serve as a support for the piece which is being cut out by the saw 10. These parts are mounted upon a shaft

11, which may be extended through the coupling 5, the valve-casing 4, and the branch 3, so as to cause the cutting instruments to engage with the main. The shaft passes through a stuffing-box (not shown) and is supported by the bearing 12 at its forward end. This bearing is preferably a roller-bearing, as shown. The shaft 11 also passes through a sleeve 13, which sleeve may be provided with a bearing 14. This bearing may also be a roller-bearing.

The periphery of the sleeve 13 is threaded, as shown, and engages within a nut 15, carried by the frame 8. The sleeve 13 is provided with handle-rods 16, by means of which it may be rotated and the drills set forward. A driving spur-gear 17 is loosely journaled on the shaft 11 and has secured to its hub a thrust-bearing 18, with which the end of the sleeve 13 coacts. This bearing is preferably a ball-bearing and is so constructed that the gear 17 cannot be moved forward longitudinally upon the shaft 11 except by the movement of the sleeve 13. The gear 17 is provided with an elongated hub 19, having notches therein. These notches are adapted to engage with the pin 20, which may be passed through one of the several holes 21, formed in the shaft 11. This provides a connection between the gear 17 and the shaft 11 for rotating the latter. The gear 17 is adapted to engage with the elongated pinions 22, carried by the shafts 23, mounted on each side of the shaft 11 and carried by bearings on the frame 8. These shafts are rotated by means of spur-gears 24, which are engaged by a gear 25, which is engaged by a pinion 25'. This pinion is carried by a shaft 26. Upon the shaft 26 is a spur-gear 27, engaging with the pinion 28. The pinion 28 is mounted upon the driving-shaft of a gasolene-motor 29. The motor 29 is secured to a foundation-plate 30, secured to the frame 8. The system of spurs and pinions produces a speed-reduction gearing by means of which the relatively high speed of rotation on the engine-shaft may be transmitted to the relatively slow movement of the shaft 11 in order to secure the proper cutting effect on the main 1. The shaft 11 is provided with a collar 31, which may be secured in place by means of a bolt 32. The collar 31 is for securing the shaft against movement during shipping. It is brought into action by sliding the shaft back until the head carrying the saw comes into contact

with the front bearing 12. Then the collar is slid along the shaft until it comes into contact with the bearing 15. The collar is then secured by the set-screws. The outer end of the shaft 11 is provided with a pulley 34.

The water-jacket of the motor 29 is connected, by means of a pipe 35, to the extension-coupling 5, so that water in the coupling 5 may pass through the pipe 35 and through the water-jacket. Means is provided for supplying water to the water-jacket before the coupling 5 becomes filled, which means may consist of a reservoir 36, connected to the pipe 35. Situated in the pipe 35 is a three-way valve 37, which may allow communication between the reservoir 36 and the water-jacket of the motor and cut off the connection between the extension-coupling and the water-jacket, or the valve may be so set as to allow communication between the extension-coupling and the water-jacket and cut off that between the reservoir and water-jacket.

The operation of the apparatus is as follows:
 25 The sleeve 2 having been attached to that portion of the main 1 which it is desired to tap, and the branch 3 being located in the proper position, the sleeve is secured in place and the joints properly calked. The valve-casing 4 is then bolted to the branch, the extension-coupling 5 is bolted on the valve-casing, and the drilling-machine frame 8 is bolted to the coupling. The shaft 11 is then pushed inward until the bit 9 comes into engagement with the main. The sleeve 13 is then rotated until it is moved to the extreme rearmost position. The pin 20 is then introduced through one of the openings 21 in the shaft 11 between the slots on the hub of the gear 17. The motor is then started, and by means of the gearing comprising the pinions and spurs 28, 27, 25', 25, 24, 22, and 17 the shaft 11 is rotated at the proper speed. The bit is fed against the work by manually rotating the sleeve 13 through the agency of the thrust-bearing 18, and the connection between the gear 17 and the shaft 11 will advance the latter and cause the bit to engage with the work. After the twist-drill 9 and hollow drill 9' have entered the pipe and the saw begins to act a key 33 is driven into a keyway 33' of the shaft and into a corresponding keyway in the screw 13, thereby securing the screw and the shaft together and making the feed automatic. As soon as the main is perforated the water will escape through the opening and will enter and fill the branch 3, the valve-casing 4, and the extension-coupling 5. The

water can then escape through the pipe 35 and through the water-jacket on the motor. The amount of escaping water can be regulated by properly proportioning the size of the pipe 35 or by the manipulation of the cock 37. The rotation of the engine will be continued until the saw 10 has removed the piece of pipe which is being cut out. The motor will then be stopped. A rope will be passed around the pulley 24 and one end secured and the other hauled upon it, so as to relieve the pressure upon the pin 19. This pin being taken out, the pressure of the fluid within the main 1 will force out the saw 10, and with it the shaft 11, and the rope may be used to control the outward movement of the shaft 11. The valve in the casing 4 may be then closed, the coupling 5 unbolted, and the branch main attached.

If it is desired or necessary to avoid the use of a gas-engine, the drills may be manually rotated by applying wrenches to the shaft 23. The ends of these shafts are squared at 38 for the attachment of such wrenches.

The employment of a gasoline-engine attached to the frame of a drilling-machine is particularly advantageous, as it produces an extremely portable apparatus and one which will be self-contained. The pit may be the minimum size and the cutting operation greatly facilitated. The water-jacket may be kept cool during the preliminary drilling operation and before the water is allowed to escape into the extension-coupling 5 by means of a small amount of water which may be supplied by buckets into the reservoir 36. Instead of a gasoline-engine any other form of internal-combustion engine may be employed.

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

In an apparatus for tapping mains, the combination with the coupling, and parts connected thereto, of a drill-shaft, drill, and an annular saw, a frame for supporting the same, an internal-combustion engine mounted upon the frame, gears between the engine and shaft for rotating the latter, and a connection between the coupling and water-jacket of the engine, to admit water after the saw has been brought into action.

This specification signed and witnessed this 3d day of October, 1905.

WALTER H. VAN WINKLE.

Witnesses:

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