

No. 618,324.

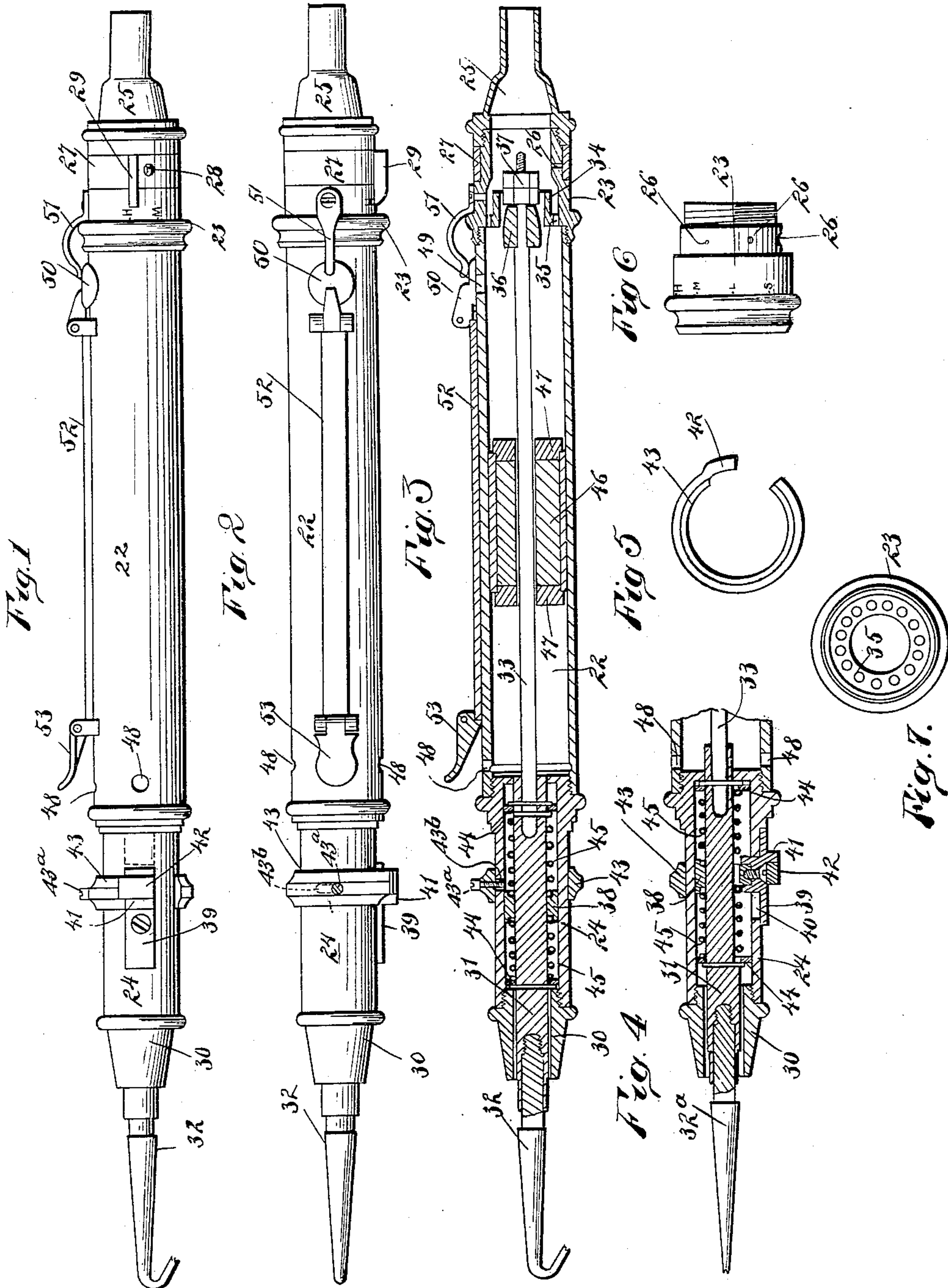
Patented Jan. 24, 1899.

R. BLUM.  
DENTAL PLUGGER.

(Application filed Dec. 9, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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Fig. 8

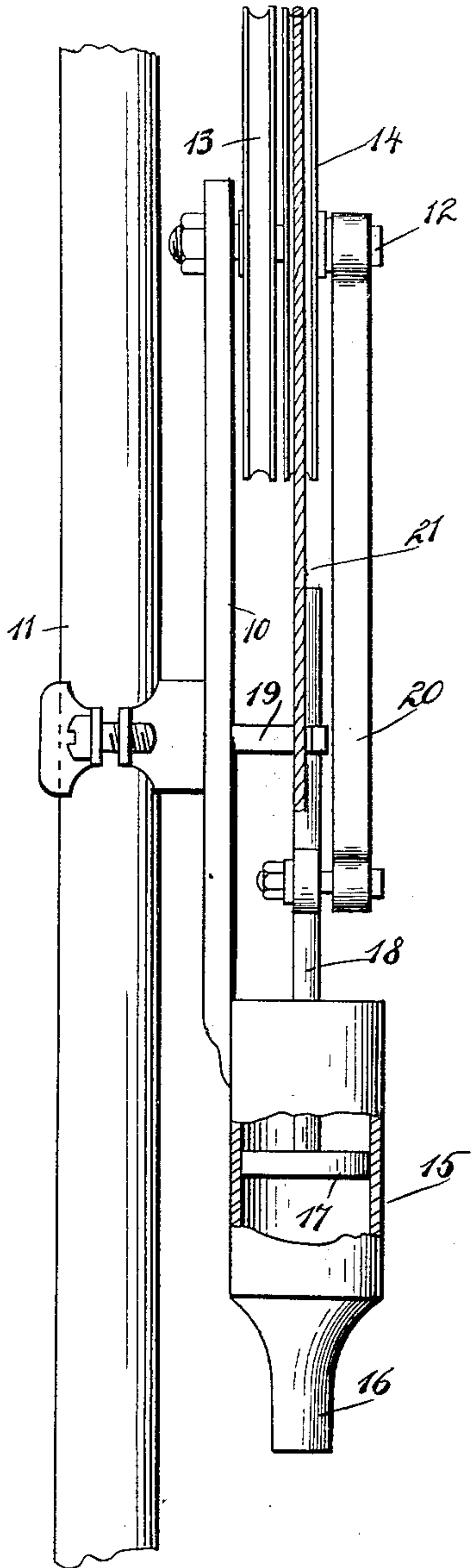
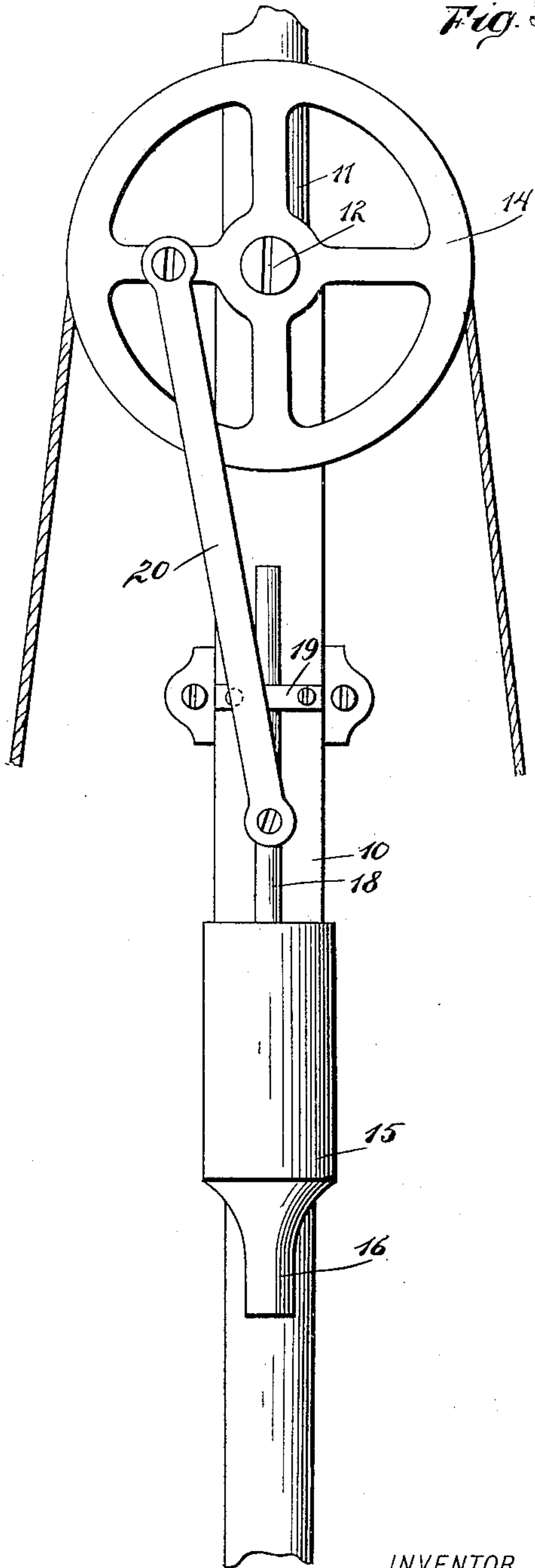


Fig. 9



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# UNITED STATES PATENT OFFICE.

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## DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 618,324, dated January 24, 1899.

Application filed December 9, 1897. Serial No. 661,250. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT BLUM, of Corpus Christi, in the county of Nueces and State of Texas, have invented a new and Improved Dental Plugger, of which the following is a full, clear, and exact description.

This invention relates to dental pluggers of that class in which the tool or plugger point is operated to deliver either a forward or backward blow by the action of a mallet-block adapted to slide in the casing or handpiece, the same being propelled by a pneumatic engine or pump which produces a pulsating or alternately expansive and exhaustive action on the body of air within the chamber of the handpiece of the plugger.

This specification is the disclosure of one form of my invention, while the claims define the actual scope of the invention.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the dental plugger. Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal section taken through the plugger. Fig. 4 is a fragmentary longitudinal section showing the plugger adjusted for a stroke different from that incident to the adjustment in Fig. 3. Fig. 5 is a fragmentary elevation of the lock-ring employed to effect the adjustment shown in Figs. 3 and 4. Fig. 6 is a detail view of the head-cap. Fig. 7 is an end elevation thereof. Fig. 8 is an edge elevation of the dental engine with a part broken away, and Fig. 9 is a side elevation thereof.

The engine for producing the pulsating or alternately expansive and exhaustive action on the air has a body plate or frame 10, that is clipped to a suitable support 11, and has a stub-shaft 12 secured to its upper portion and carrying two loose sheaves 13 and 14. The lower end of the plate 10 carries a cylinder 15, having the upper end open to the atmosphere and the lower end to a nozzle 16, with which a flexible tube is to be connected. Working in the cylinder 15 is a valveless piston 17, having its rod 18 sliding in a guide 19, carried by the plate 10. The rod 18 is connected with the sheave 14 by means of a pitman 20. The sheave 14 is driven by a belt 21, running from a treadle or other source of primary movement. By shifting the belt

21 to the sheave 13 the action of the engine may be restrained, because the sheave 13 is a loose sheave.

The dental plugger has a cylindrical casing 22, to the inner end of which a hollow inner section or head-cap 23 is screwed and to the opposite end of which an outer section 24 is screwed. The head-cap 23 has a nozzle 25 screwed to its outer end. This nozzle may be connected with the tube leading from the nozzle 16. The head-cap 23 is provided with a series of dissimilar vent-orifices 26, and around the head-cap at the point of these orifices 26 an annular band 27 is arranged to move circumferentially. The band 27 is provided with a single large orifice 28, (for which see Fig. 1,) capable of registering with any one of the openings 26. The band 27 has an indicator 29, projecting over the head-cap 23 and reading on letters marked on the head-cap, so that the band may be adjusted to place the opening 28 in registry with any one of the three dissimilar openings 26 and so that the band may be adjusted to close all of said openings. By these means the force of the pulsating current acting on the mallet-block may be graded according to the work that is to be performed.

The outer section 24 has at its outer end a screw-cap 30. Sliding through the screw-cap 30 and through the outer section 24 is an elongated block 31, to the outer end of which the dental tool 32 is screwed. The inner end of the block 31 is rigidly connected with a rod 33, extending centrally through the casing 22 and having its inner end extending through a boss 34, formed around an opening in the foraminated web 35, which forms part of the head-cap 23 and is located at the inner end thereof. The upper end of the rod 33 carries an abutment-block 36 for receiving the blow of the mallet when the apparatus is adjusted for backward strokes, and the block 36 is held by nuts 37, screwing on the rod 33. When the apparatus is adjusted for forward blows, the block 36 is moved into the boss 34, so as not to project downward therefrom, and as a result of this action the elongated block 31 is moved past the inner end of the section 24, so as to receive the blow of the mallet-block, which thereby effects the forward blows of the plugger.

The adjustment for regulating the forward



and backward blows of the plugger is effected by means of a ring 38, sliding in the section 24 and connected with a lock-plate 39, which slides on the outer side of the said section 24, the locking-plate having a portion projected through a slot 40 in the outer section, so as to engage the ring 38, and such portion is fastened thereto by means of a screw, as shown in Fig. 4. The locking-plate 39 has a projecting lug 41, which is designed to be engaged by the finger 42 on the locking-ring 43. The ring 43 is mounted on the outer section 24, so as to have turning movement thereon, such movement being limited by a screw 43<sup>a</sup>, held on the ring 43 and working through a transverse slot 43<sup>b</sup> in the section 24. Two stop-rings 44 are fast on the elongated block 31 and are so arranged as to permit said block a slight movement in the section 24, such movement being equivalent to the blow of the plugger. Bearing, respectively, against the stop-rings 44 are expansive spiral springs 45, which are located one on each side of the ring 38 and which bear, respectively, against the same, thereby actuating the block 31 in both directions. By shifting the locking-plate 39 throughout the limit of the slot 40 the ring 38 is moved correspondingly. When the ring 38 is moved outward, the device is adjusted for backward blows, since the block can then move only inward, and when the ring 38 is held inward by the action of the parts 39 and 43 the block can only move outward and is therefore adjusted for forward blows. The backward blows are administered against the abutment-block 36 and the forward blows are administered against the upper end of the elongated block 31.

The mallet-block 46 delivers the blows aforesaid, and this element slides in the cylindrical casing 22 and has packing on its sides, so that the block may act as a piston in the cylindrical casing. The block may also be provided with yielding head-pieces 47 for administering the blows. The outer end of the casing 22 is provided with a series of vent-orifices 48, so that the space between the outer section 24 and the mallet-block 46 will always be open to atmospheric pressure. The upper portion of the casing 22 is provided with an orifice 49, closed by a valve 50, which valve is pressed to its seat by a spring 51, carried by the head-cap 23. The valve 50 may be moved against the spring to uncover the orifice 49 by means of a push-plate 52, sliding on the outer side of the cylindrical casing 22 and actuated by a finger-plate 53 at the forward portion of the casing 22.

The operator in using the apparatus adjusts the plate 39 for forward or backward blows, as desired, and upon operating the engine the alternately expansive and exhaustive pulsations of the air acting in the cylindrical casing 22 causes the mallet-block 46 to move rapidly forward and backward in the casing. According to the adjustment of the

apparatus one of the blocks 31 or 36 will be struck and the dental tool will be actuated forward or backward in accord with such adjustment. The action of the plugger may be stopped instantly by pressing on the finger-piece 53, whereupon the valve 50 is raised and the pulsations of the current of air above the block 46 are destroyed. The air passes through the foraminated web 35 on its way from the head-cap to the casing. According to the opening 26, that is placed in communication with the atmosphere by means of registry with the opening 28 in the ring 27, the force of the blow of the mallet-block will be great or small. This force may be increased to the maximum by closing up completely the openings 26, or it may be reduced to the minimum by placing the opening 28 in registry with the smallest of the openings 26.

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

1. In a dental plugger, the combination of a cylindrical casing, pneumatically-operated means within the casing for driving the dental tool, a spring-pressed valve commanding an orifice in the casing, a push-plate mounted to slide longitudinally on the casing and engaging the valve to open the same, and a finger-piece mounted to swing on the casing and engaging the push-plate to throw the valve.

2. In a dental plugger, the combination of a hollow outer section having a slot therein, a block mounted to move back and forth in the outer section, a ring encircling the block, two expansive springs encircling the block and bearing against opposite sides of the ring, a sliding lock-plate having a portion projected through the slot of the outer section and connected with the ring of the block, and a ring mounted to turn on the outer section and capable of engaging the lock-plate to hold the same.

3. In a dental plugger, the combination of a cylindrical casing, means for carrying the dental tool, such means being supported by the casing, a mallet movable through the casing and having hermetic connection with the interior walls thereof, so that an alternate current of air in the casing at one side of the mallet will cause the mallet to be thrown back and forth in the casing whereby to drive the said means for carrying the dental tool, the casing being provided with an orifice in each end, and a hand-operated valve commanding one of the orifices whereby the interior of the casing at one side of the mallet is continually in communication with the atmosphere, and whereby the interior of the casing at the other side of the mallet is normally out of communication with the atmosphere.

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Witnesses:

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