

No. 773,562.

PATENTED NOV. 1, 1904.

E. GERRY.
EARTH AND ROCK AUGER.
APPLICATION FILED DEC. 11, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.

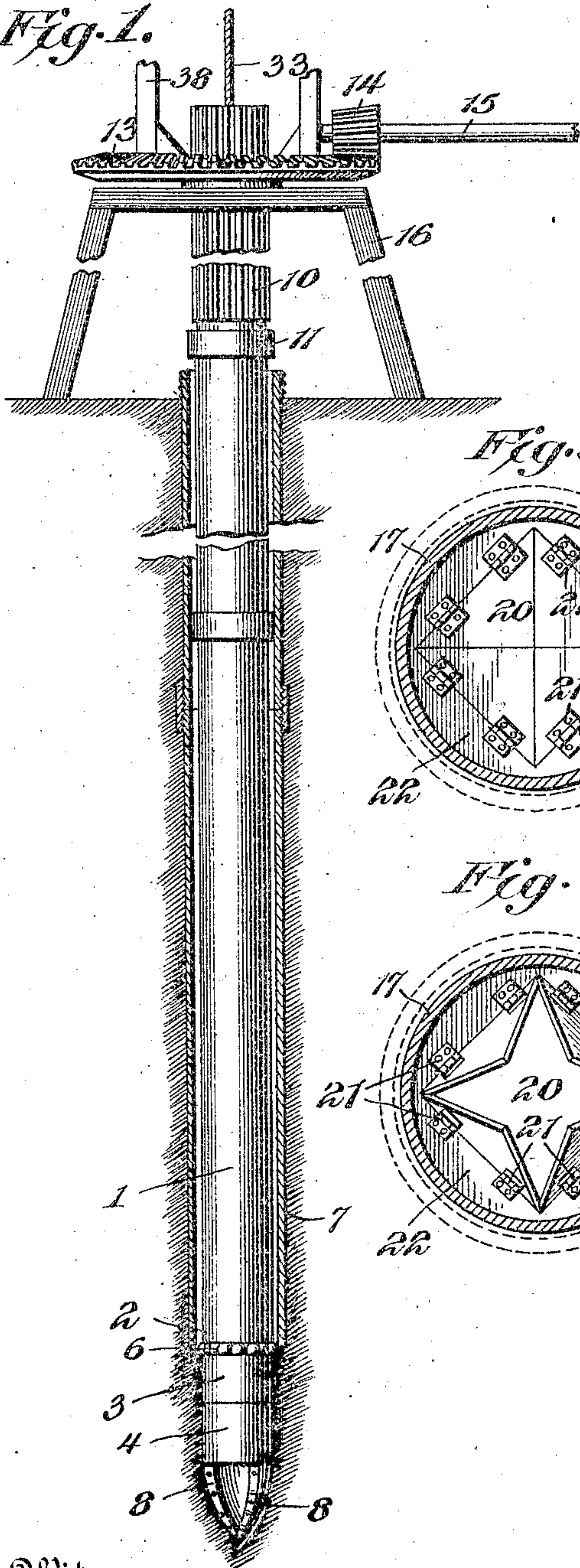


Fig. 2.

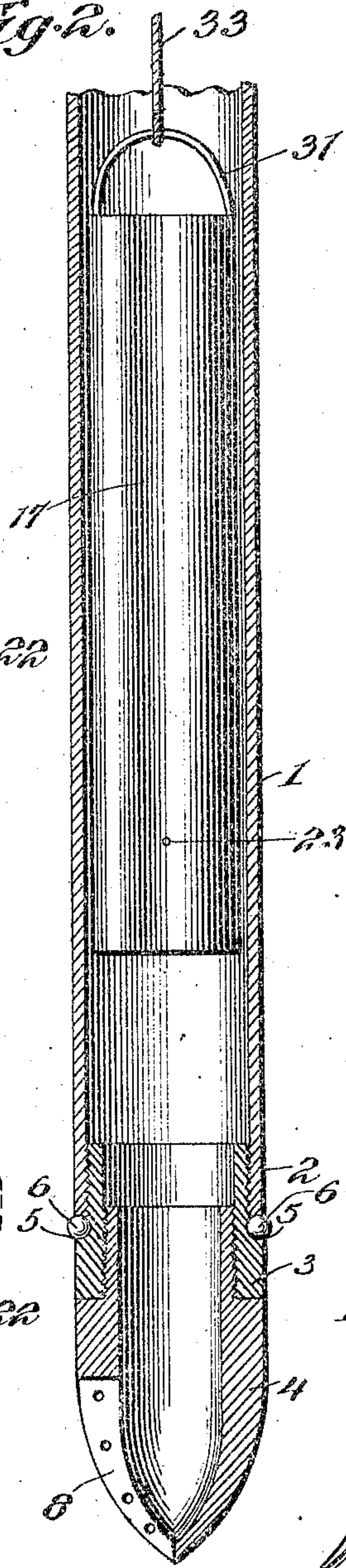


Fig. 5.

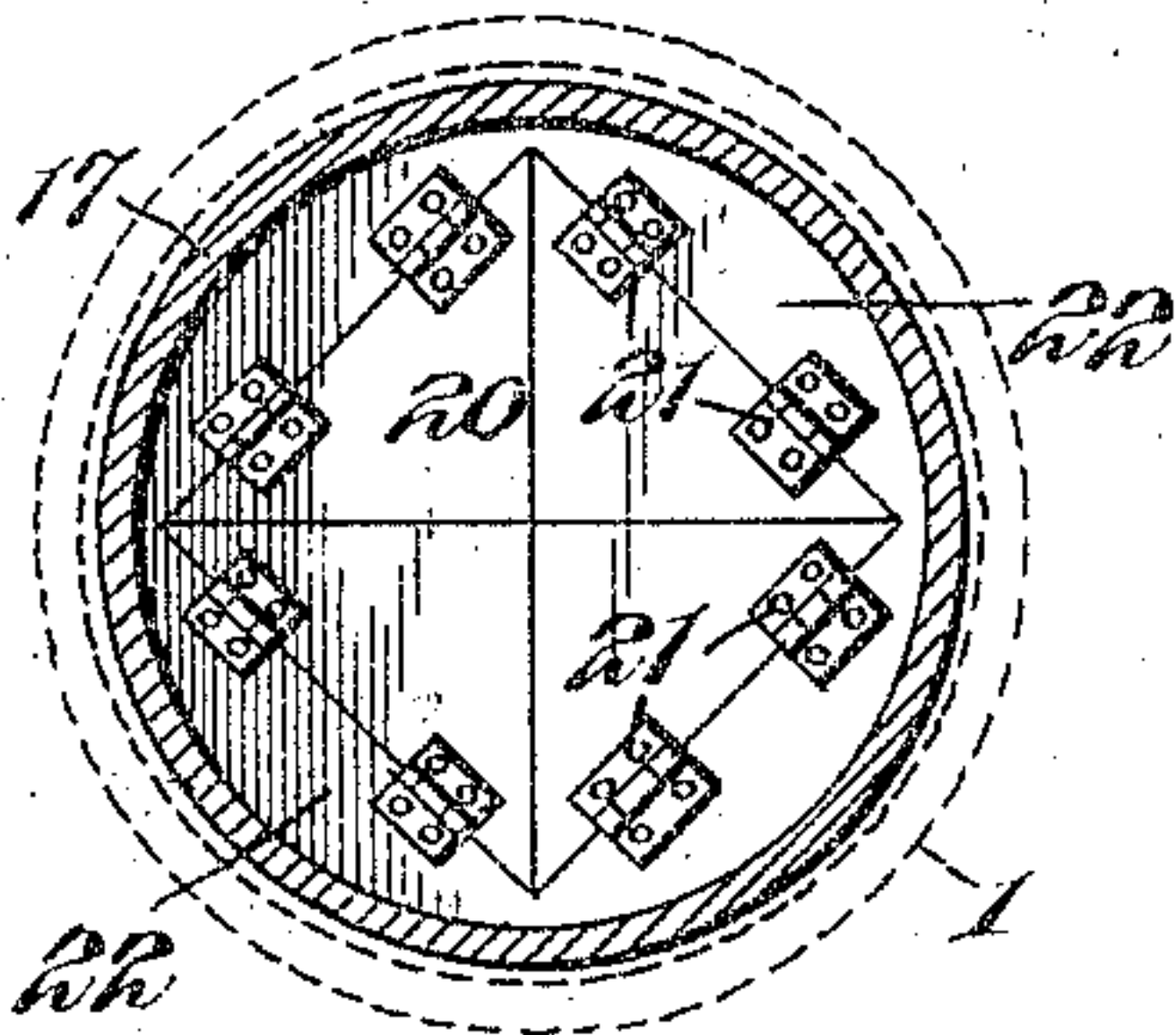


Fig. 6.

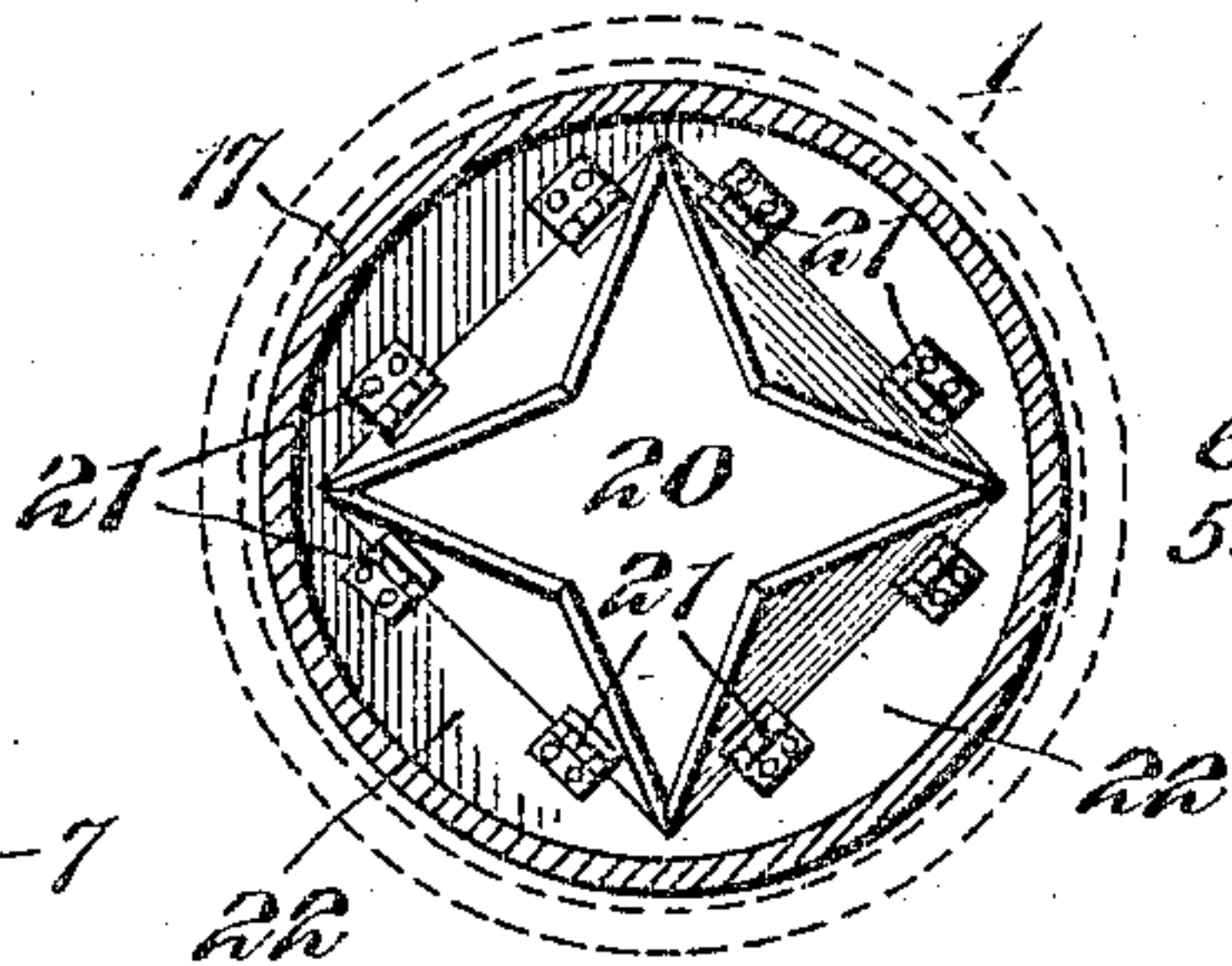
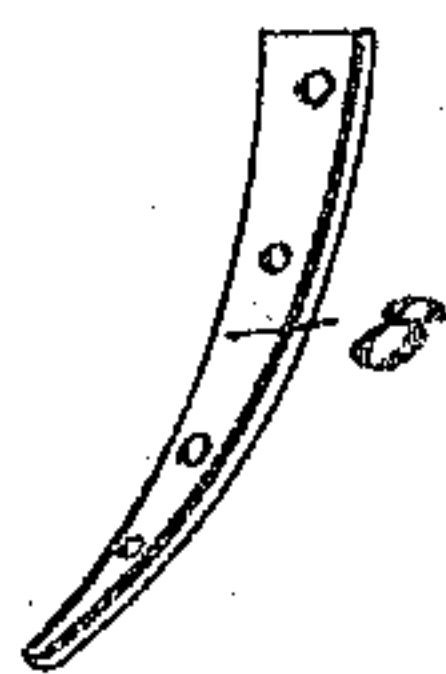


Fig. 9.



Witnesses

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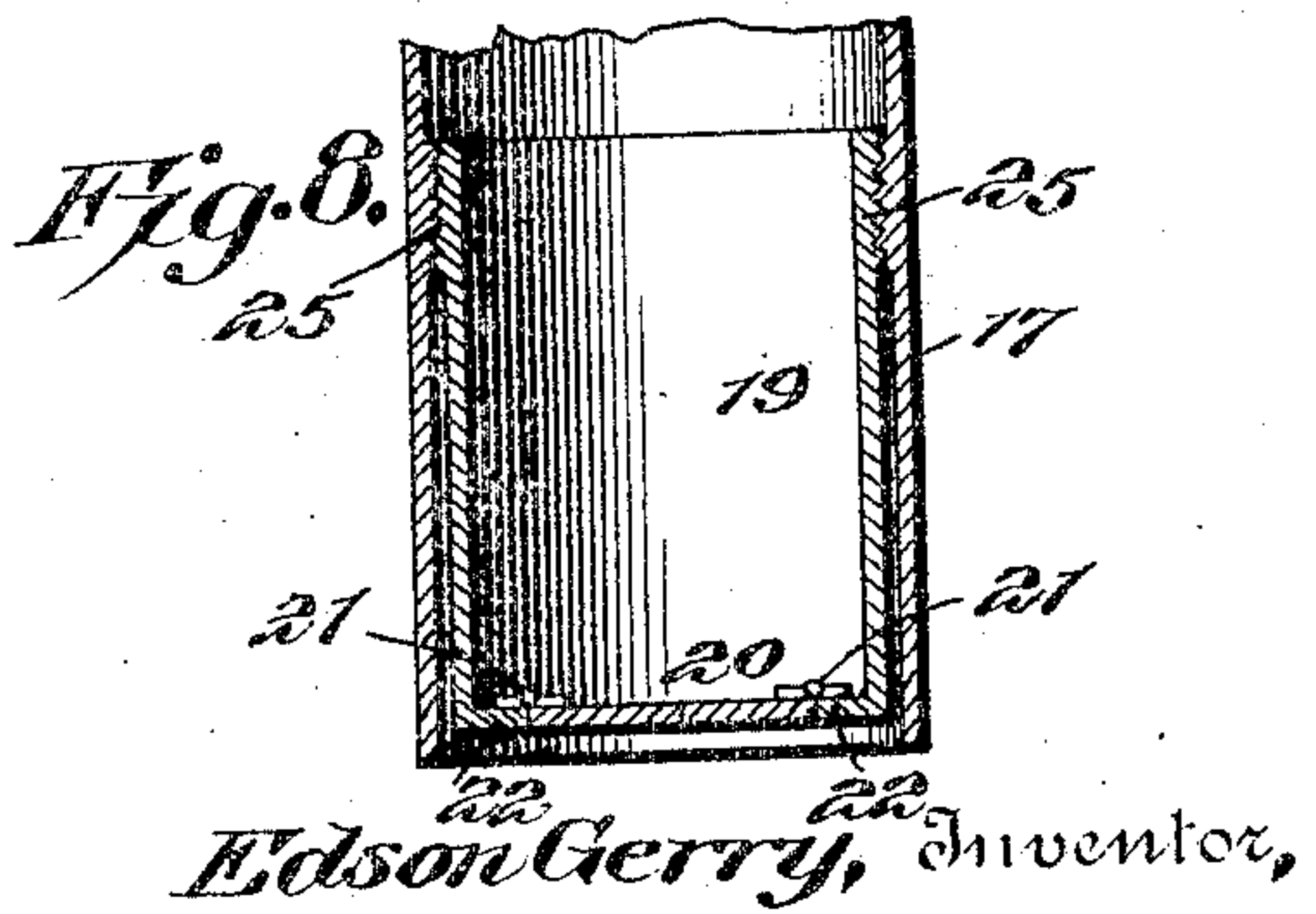
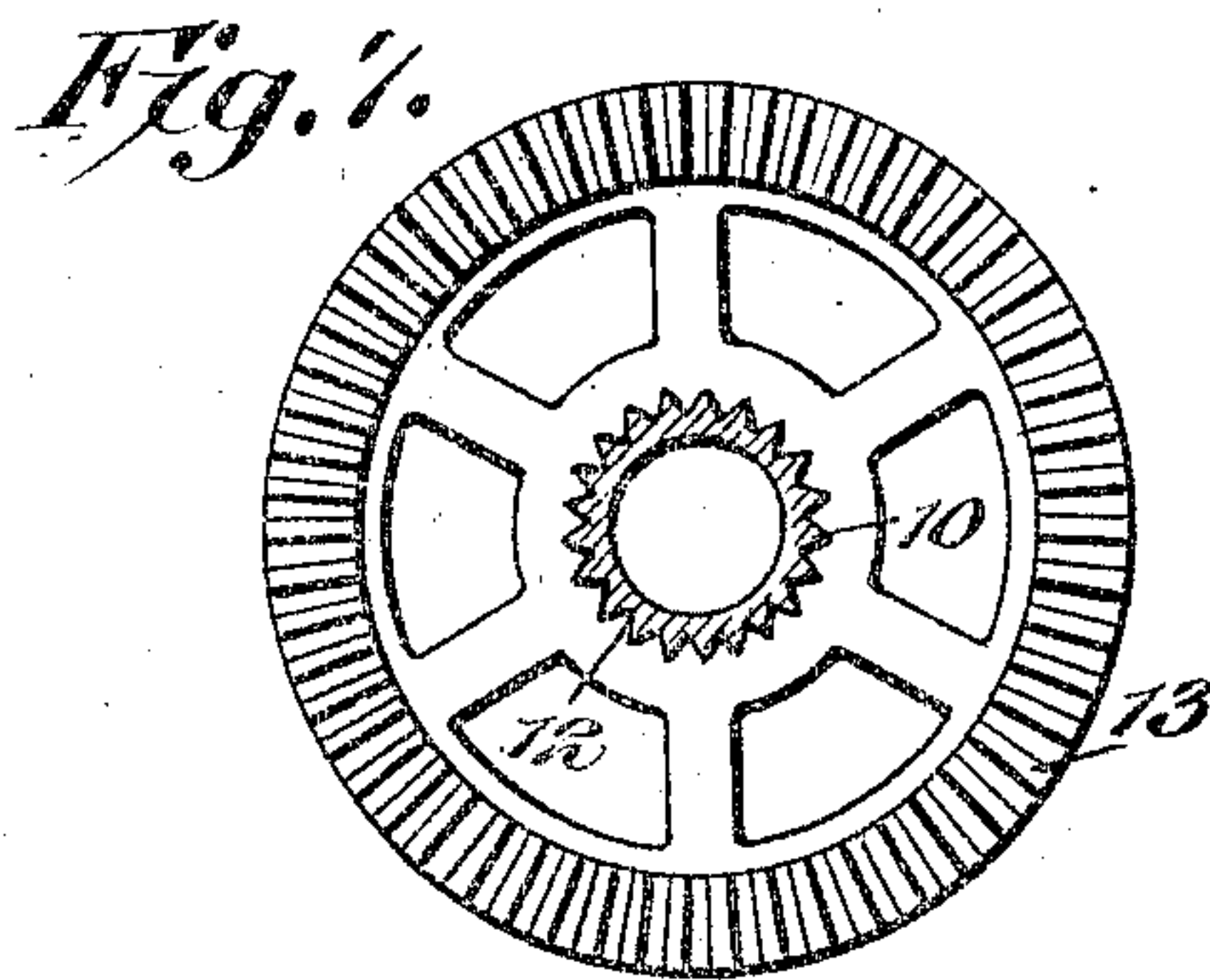
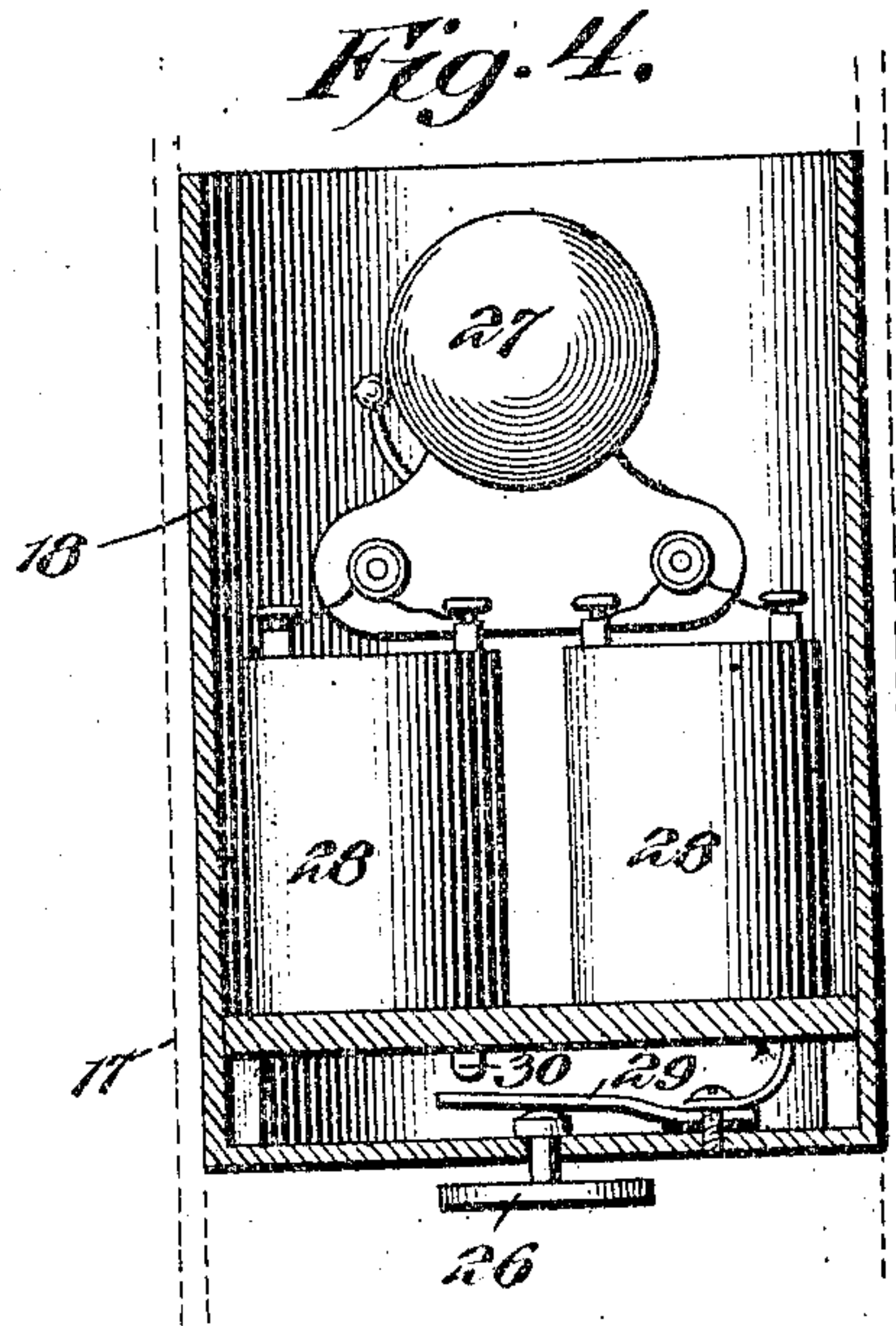
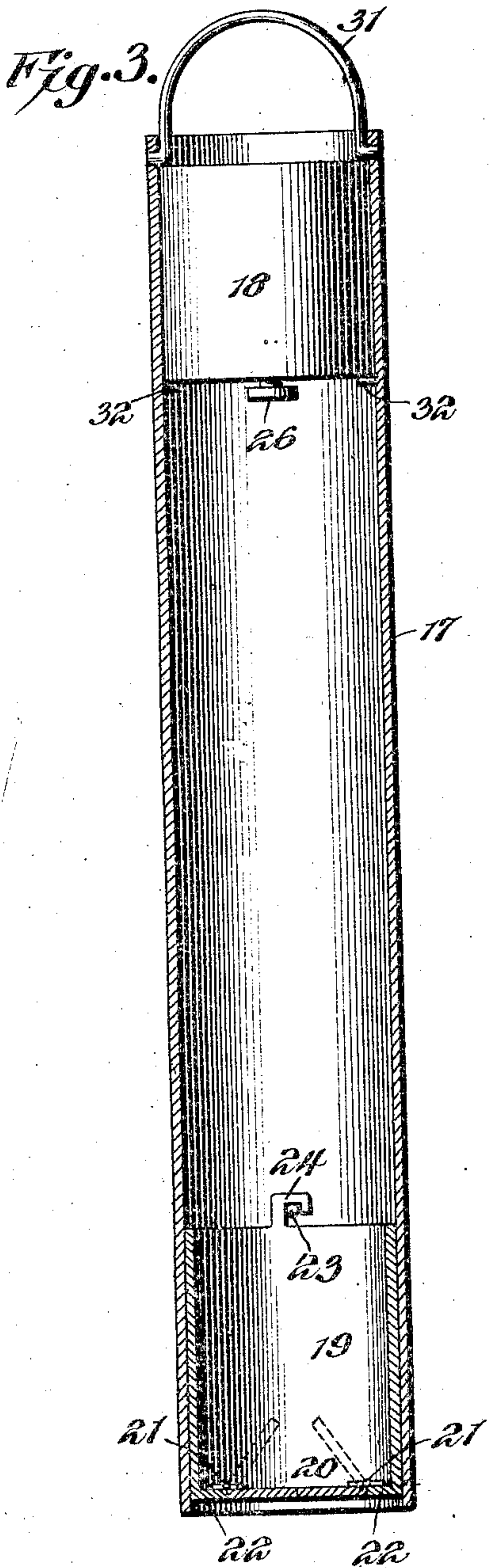
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3 SHEETS--SHEET 2.



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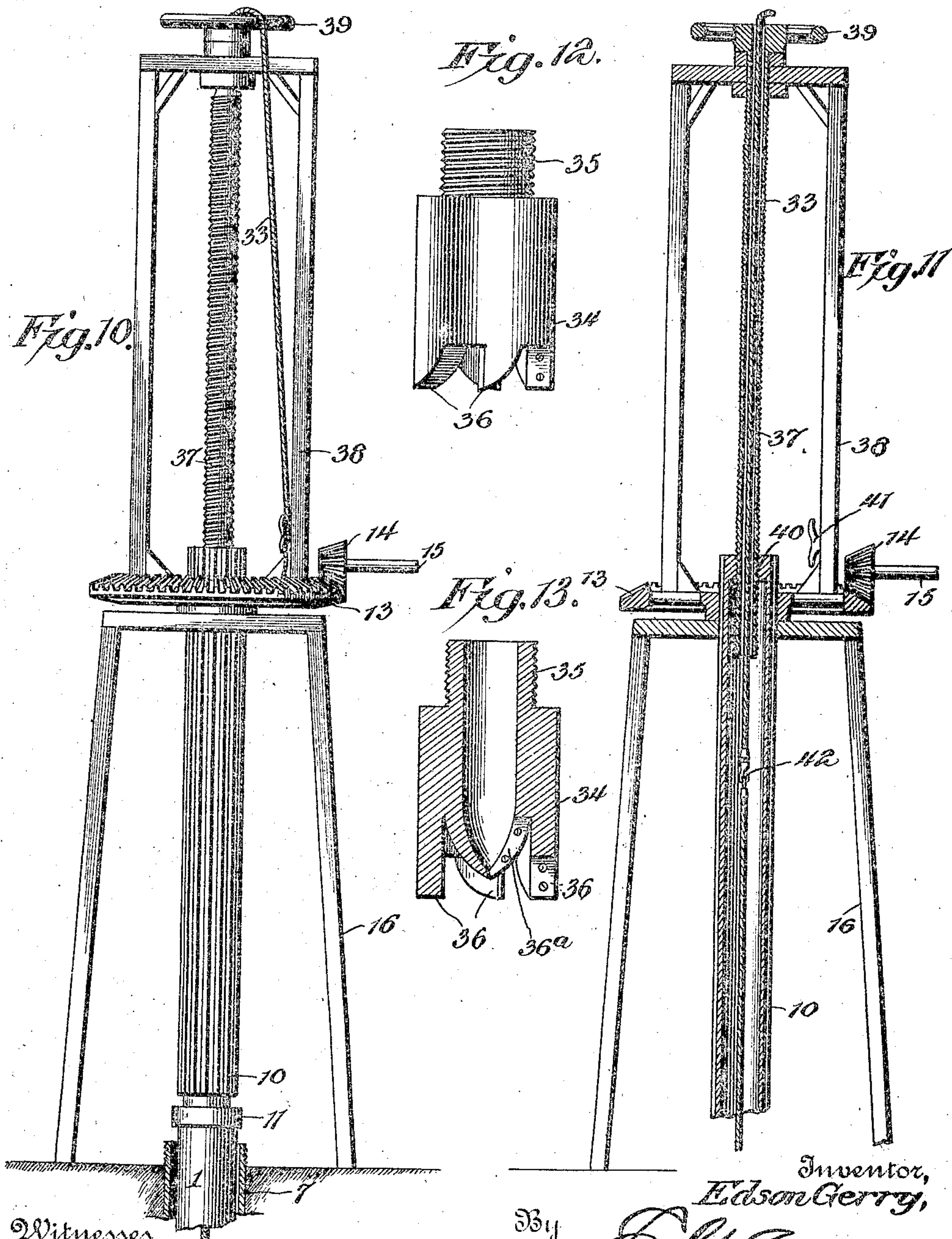
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NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

EDSON GERRY, OF WHATCOM, WASHINGTON.

EARTH AND ROCK AUGER.

SPECIFICATION forming part of Letters Patent No. 773,562, dated November 1, 1904.

Application filed December 11, 1903. Serial No. 184,800. (No model.)

To all whom it may concern:

Be it known that I, EDSON GERRY, a citizen of the United States, residing at Whatcom, in the county of Whatcom and State of Washington, have invented a new and useful Earth and Rock Auger, of which the following is a specification.

The invention relates to earth and rock augers.

The object of the present invention is to improve the construction of earth and rock augers and to provide a simple, inexpensive, and efficient one designed especially for prospecting mining-ground and adapted to collect the borings automatically and capable of permitting the same to be readily raised to the surface of the ground and removed without necessitating the removal of the auger.

A further object of the invention is to provide an auger of this character in which a continuous alarm will be automatically sounded when the receptacle containing the borings is filled and which will permit the borings to be readily removed from the receptacle after the same has been lifted from the drill-tube of the auger.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation, partly in section, of an auger or drill constructed in accordance with this invention. Fig. 2 is an enlarged sectional view of the lower portion of the auger, the removable receptacle for the borings being illustrated in side elevation. Fig. 3 is a vertical sectional view of the receptacle for the borings, the lower removable cup or member being in section and the upper cup or member being in elevation. Fig. 4 is an enlarged sectional view of the upper removable cup or member.

Figs. 5 and 6 are detail views of the lower removable cup or member, illustrating the construction of the automatically-opening valves and showing the same both closed and open. Fig. 7 is a plan view, partly in section, illustrating the construction of the horizontal gear for actuating the drill-tube. Fig. 8 is a detail sectional view illustrating another construction for securing the lower cup or member of the receptacle in position. Fig. 9 is a detail view of one of the detachable blades. Fig. 10 is an elevation of the upper portion of the auger, illustrating the construction for controlling the feed. Fig. 11 is a vertical sectional view of the same. Fig. 12 is a detail view of the rock-boring drill-point. Fig. 13 is a sectional view of the same.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a drill-tube, which may be of any desired diameter and length and which is designed to be constructed in the usual manner of sections and to be increased in length as the hole deepens. The lower end 2 of the lower section of the drill-tube is interiorly threaded to receive a tubular drill-head 3, and the latter is interiorly threaded at its lower portion to receive a drill-point 4. The upper portion of the drill-head is exteriorly threaded and screws into the lower end of the lower section of the drill-tube, the upper portion of the drill-head being preferably reduced, as shown in Fig. 2. The shoulder 5, formed by reducing the upper portion of the drill-head, is adapted to receive a series of antifriction-balls 6, which are interposed between the said shoulder and the lower end of the drill-tube, as shown. The shoulder 5 and the lower end of the drill-tube are grooved to provide a ball-race, and the space between the parts at the outer face of the drill-tube is less than the diameter of the balls, whereby the latter are retained in the ball-race. The balls are adapted to engage the lower ends of a well-casing 7 to facilitate the operation of the auger when it is desired to leave a well-casing in the hole and when such well-casing is fed downwardly with the auger.

While the auger is especially designed for prospecting in mineral lands, it is also adapted for drilling wells, and the latter may be supplied with well-casings or not, as desired.

5 These antifriction-balls are adapted to prevent the well-casing from retarding the drill-tube by binding against the same.

The drill-point 4 is preferably tapered or conical, as shown in Figs. 1 and 2, with one
10 or more sections or portions cut away to form upright edges, to which blades 8 are preferably secured. These blades are detachable and are adapted to be removed when worn for sharpening and also for permitting sharp
15 blades to be substituted for them. The shape of the auger and the amount of cutting edge presented may be changed to adapt it to the character of the land to be bored.

The drill-tube is connected with a corrugated section 10, provided at its lower end with a threaded collar 11 to enable it to be coupled to the upper end of the ordinary drill-tube section. The corrugated section 10 is adapted to slide through an opening 12 of a
20 horizontal gear-wheel 13, meshing with a bevel-pinion 14 of a horizontal shaft 15, which may be operated by hand, horse-power, electricity, or any other motive power. The central opening 12 of the horizontal gear 13 is
25 provided with notches to conform to the configuration of the corrugated section or member 10, which is slidably interlocked with the wheel or gear 13 and which rotates when the latter is actuated. The feed of the auger is
30 regulated by a screw which engages the corrugated section, as hereinafter explained. The horizontal drill-tube-actuating gear is supported upon a suitable framework 16, and the corrugated tube is of a sufficient length to
35 enable it to be readily elevated above the uppermost section of the drill-tube in the hole to permit another section to be applied to the same. The drilling apparatus may be constructed of any desired size to adapt it for
40 drilling deep wells and also for enabling it to be conveniently carried by prospectors. The drill-point may be constructed of any suitable material, such as electrified carbonated steel. The auger-head is preferably constructed of
45 common steel, and the drill-tube and casing preferably consist of the ordinary iron-pipe sections usually employed for such work.

In order to enable the character of the land and the minerals, ore, rocks, and the like to
50 be readily ascertained, the auger is provided with a removable receptacle 17, consisting, preferably, of a sheet-metal cylinder and upper and lower cups or members 18 and 19. The lower cup or member, which is preferably
55 constructed of sheet metal, is detachably secured within the lower end of the receptacle and is provided with an upwardly-opening valve 20, constituting the bottom of the cup, and preferably consisting of four approxi-
60 mately triangular sections connected by

hinges 21 to a rigid horizontal section or portion 22 of the bottom of the cup or member, as clearly illustrated in Figs. 5 and 6 of the drawings. The tapering sections of the valve
65 20 are arranged in the same plane as the rigid section or portion 22 when the valve is closed, and the said sections form a horizontal bottom for the cup or member 19. The triangular valve-sections are maintained in a closed
70 position by gravity, and they are adapted to be automatically opened by the borings which are forced upward through the bottom of the receptacle as the drill or auger moves downward through the soil, rocks, or other material operated on by the same. The lower section or member, which is readily detachable,
75 may be secured within the receptacle by any suitable means, such as lugs or projections 23 and catches 24. The lugs or projections extend inward from the sides of the receptacle, and the catches 24 preferably consist of upwardly-extending hooks for engaging the
80 lugs or projections; but screw-threads 25 may be employed for connecting the parts, as shown in Fig. 8, or any other means may be provided for effecting this result.

As the drill or auger penetrates the soil, rock, or other material the borings pass upward and force their way through the lower end of the receptacle, which is thereby filled
85 until the contents come in contact with an electric button 26, adapted to close a circuit of an electric bell 27, located within the upper cup or member of the receptacle. The upper cup or member of the receptacle contains
90 suitable batteries 28, and when the button is forced upward it will carry a resilient contact plate or spring 29 into contact with a suitable contact-point 30, thereby closing the circuit and sounding the bell. The alarm thus
95 sounded will be continuous until the receptacle is removed from the drill-tube or a space formed between the borings and the button 26. By this construction the operator may readily ascertain when the receptacle is full.
100 In boring any great depth through material liable to drown the sound of the bell the condition of the receptacle may be readily ascertained by stopping the drill and applying an ear to the tube.

The upper cup or member may be secured in the upper end of the receptacle by any suitable means, and it is removable therefrom to enable an instrument to be employed for forcing the contents of the receptacle out of the
105 same should such contents be of a clayey nature and not fall readily from the receptacle when the lower cup or member is removed. The upper end of the receptacle is provided with a bail or handle 31, and the terminals thereof may be advantageously employed for locking the upper cup or member in engagement with lugs or projections 32 of the receptacle, as illustrated in Fig. 3 of the drawings; but any other means may be employed for this
110 115 120 125 130

purpose. The bail or handle is connected with one end of a rope or cable 33, extending upward through the drill-tube and designed to be arranged on a pulley to enable the receptacle to be readily raised. The receptacle is supported within the drill-tube with its lower end a short distance above the drill-head, so that the latter will not in any manner interfere with the operation of the upwardly-opening valves.

When the apparatus is employed for boring into rocks, a drill-point 34 is employed. This drill-point, which is provided with a threaded shank 35 to screw into the drill-head 3, has an annular series of cutters 36, provided with cutting edges and adapted when drilling into rock to cut a core, which is afterward reduced to borings and fed upward through the drill-tube, whereby the said borings are adapted to be removed without removing the auger. The cutters 36 are arranged at the periphery of the drill-point 34, which is also provided with a central approximately conical cutter 36^a, having a detachable cutting-blade and formed integral with the drill-point 34, as clearly shown in Fig. 13; but the central cutter may be constructed in any other desired manner and may be provided with a threaded shank to screw into the drill-point. The peripheral cutters, which are also provided with detachable blades, extend beyond the central cutter and cut a core, which is then operated on by the central cutter and reduced to borings by the same. The borings pass upward into the receptacle 17, as before explained. The blades are adapted to be removed to sharpen them or for applying new blades to the drill-point.

In Figs. 10 and 11 of the drawings is illustrated the construction for feeding the auger, which is effected by a screw 37. The feed-screw 37 is supported by a frame 38, which is mounted upon the horizontal gear 13 and which may be constructed in any desired manner, as will be readily understood. The upper end of the feed-screw is swiveled to the top of the frame and is provided with a hand-wheel 39, by means of which it is rotated; but any other suitable means may be employed for rotating the screw to feed the auger. The screw engages the corrugated section, which is provided at its upper end with interior screw-threads 40, that may be formed in any desired manner. The upright frame 38 rotates with the horizontal gear, and the rotation of the feed-screw will move the corrugated section upward and downward, as will be readily understood. The wire rope or cable, which is connected with the receptacle passes through the top of the feed-screw and extends down to the base of the frame 38, where it is secured by means of a cleat 41 or other suitable means. The wire rope or cable is composed of a series of sections provided with couplings 42, and when a section of the drill-tube is attached to the corrugated section a

section of the wire rope or cable is applied to increase the length of the cable and to obviate the necessity of withdrawing or removing the outer portion of the rope or cable from the adjusting-screw. The upper or outer section of the wire rope or cable is provided with a swiveled joint to prevent the operation of the adjusting-screw from twisting the rope or cable. The adjusting-screw is rotated until the auger is fed the distance of the length of a section of drill-tubing, and then the corrugated section is uncoupled and hoisted by rotating the adjusting-screw and another section of the drill-tube is applied. In practice the feed-screw may be constructed of sufficient diameter to permit the removal of the receptacle through it; but the receptacle may be readily removed by uncoupling the corrugated section.

What I claim is

1. In an apparatus of the class described, the combination of a drill-tube, a drill-head secured to the drill-tube and having a shoulder spaced from the lower end of the same and forming with the lower end of the drill-tube a ball-race, a series of antifriction-balls arranged in the ball-race and projecting horizontally beyond the drill-tube and the drill-head and adapted to engage a well-casing, and a drill carried by the drill-head, substantially as described.

2. In an apparatus of the class described, the combination of a drill-tube, a drill-head having a reduced upper portion fitted in and secured to the drill-tube, the lower portion of the drill-head being spaced from the lower end of the drill-tube to form a ball-race, and a series of antifriction-balls arranged in the ball-race and projecting horizontally beyond the drill-tube and the drill-head and adapted to engage a well-casing, substantially as described.

3. In an apparatus of the class described, the combination of a drill-tube, a drill-point, a corrugated section detachably connected with the drill-tube, and operating mechanism having a rotary element provided with a central opening conforming to the configuration of and receiving the corrugated section, substantially as described.

4. In an apparatus of the class described, the combination with a drill-tube, of a removable receptacle arranged within the drill-tube to receive the borings and provided with a fixed horizontal bottom section and having an inwardly-opening automatically-closing valve consisting of a plurality of tapering sections hinged to the said section and arranged in the same horizontal plane as the said fixed section when the valve is closed, and means for removing the receptacle, substantially as described.

5. In an apparatus of the class described, the combination with a drill-tube, of a removable receptacle arranged within the drill-tube to

receive the borings and provided with upper and lower detachable members, the lower member carrying an inwardly-opening valve and the upper member being provided with an alarm, substantially as described.

6. In an apparatus of the class described, the combination with a drill-tube, of a removable receptacle arranged within the drill-tube and provided with detachable upper and lower cups or members, the lower cup or member being provided with a valve and the upper cup or member having an electric bell and provided with a depending button arranged to be engaged by the borings for sounding a continuous alarm, substantially as described.

7. In an apparatus of the class described, the combination of a drill-tube having a corrugated section, a drill-point, operating mechanism having a rotary element engaging the corrugated section of the drill-tube, and a feed-screw connected with the corrugated section, substantially as described.

8. In an apparatus of the class described, the combination of a drill-tube, a corrugated section coupled to the drill-tube, operating mechanism having a horizontal gear engaging the corrugated section, a feed-screw for moving the corrugated section longitudinally, and means mounted on the gear-wheel for supporting the feed-screw, substantially as described.

9. In an apparatus of the class described, the combination of a drill-tube, a corrugated section coupled to the same, a horizontal gear engaging the corrugated section, a frame mounted on the horizontal gear, and a feed-

screw swiveled to the frame and supported by the same and engaging the corrugated section, substantially as described.

10. In an apparatus of the class described, the combination of a drill-tube, a corrugated section coupled to the same, a horizontal gear engaging the corrugated section, a frame mounted on and carried by the gear, a feed-screw supported by the frame and engaging the corrugated section, a receptacle located within the drill-tube, and a flexible connection secured to the receptacle and passing through the drill-tube, the corrugated section and the adjusting-screw, substantially as described.

11. In an apparatus of the class described, the combination of a drill-tube, a corrugated section coupled to the same, a horizontal gear engaging the corrugated section, a frame mounted on and carried by the gear, a feed-screw supported by the frame and engaging the corrugated section, a receptacle located within the drill-tube, and a flexible connection secured to the receptacle and extending through the drill-tube, the corrugated section and the adjusting-screw and composed of sections and having a swiveled joint, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EDSON GERRY.

Witnesses:

A. H. WRIGHT,
M. G. WRIGHT.