

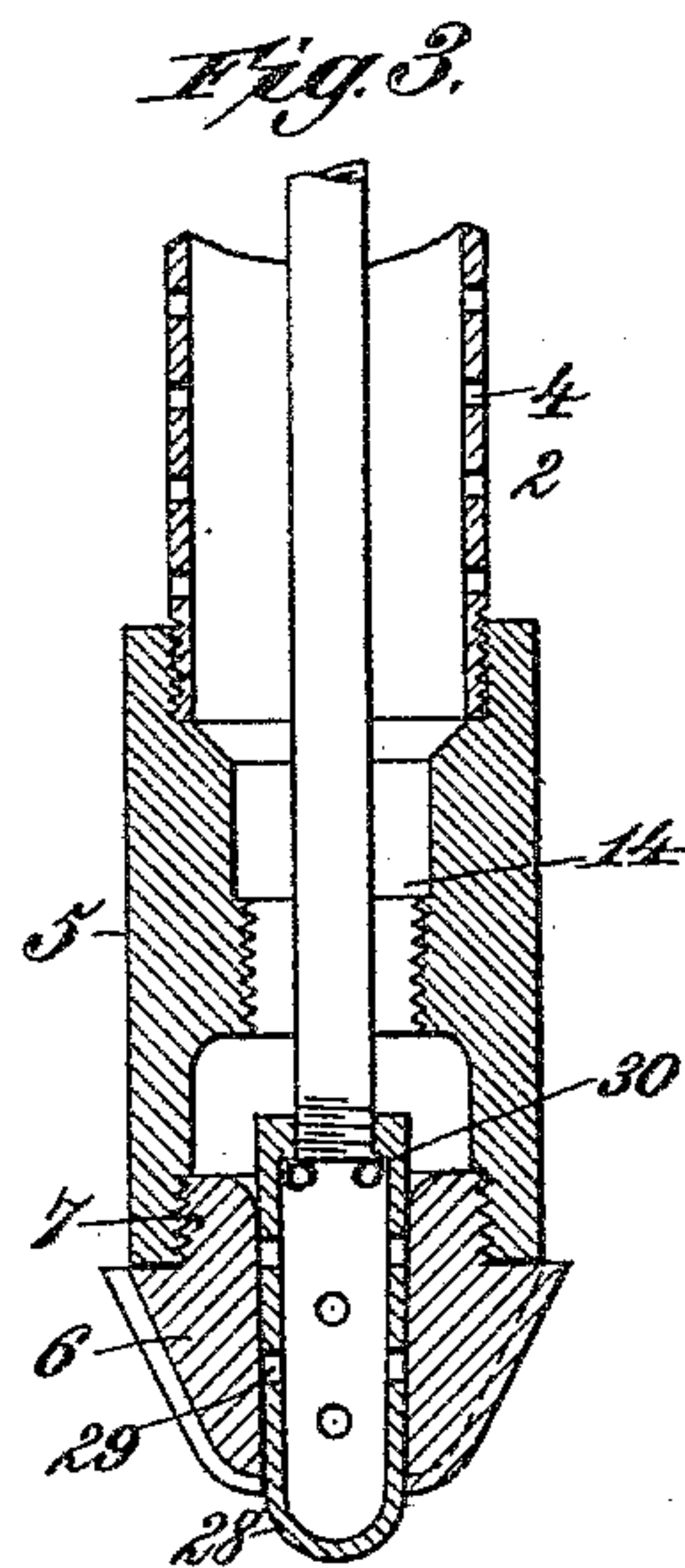
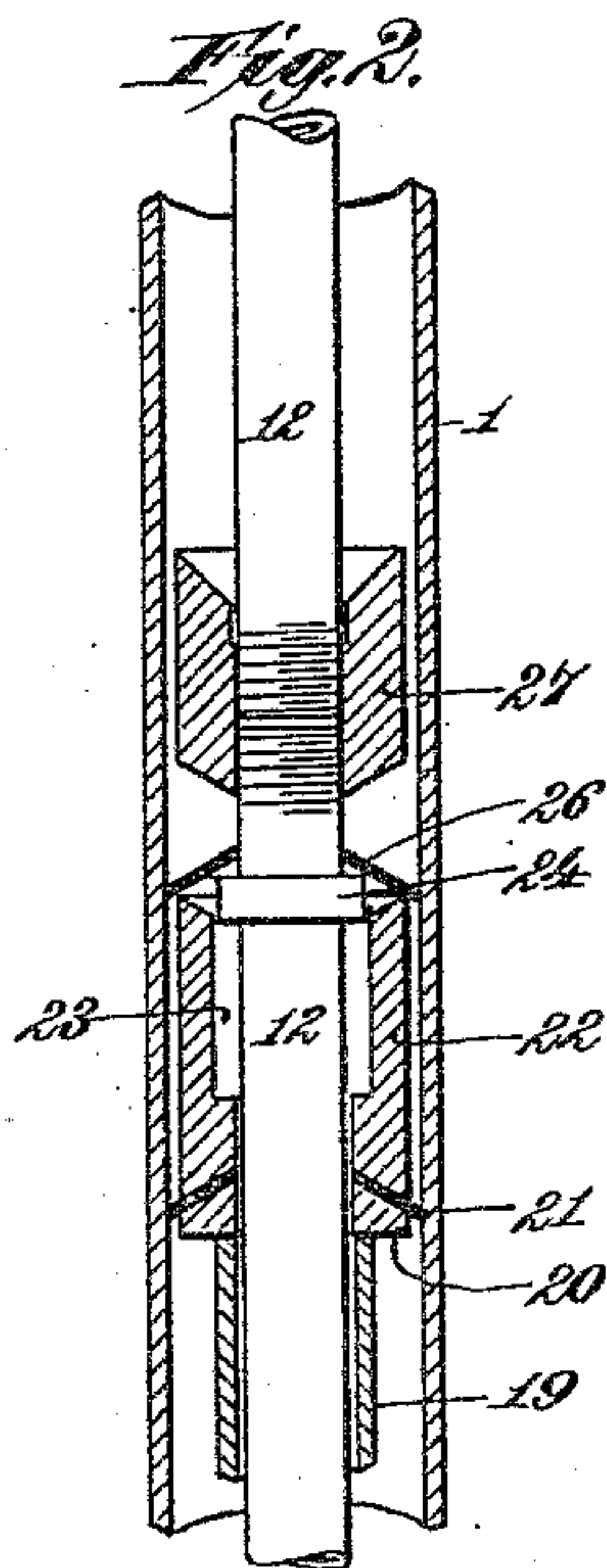
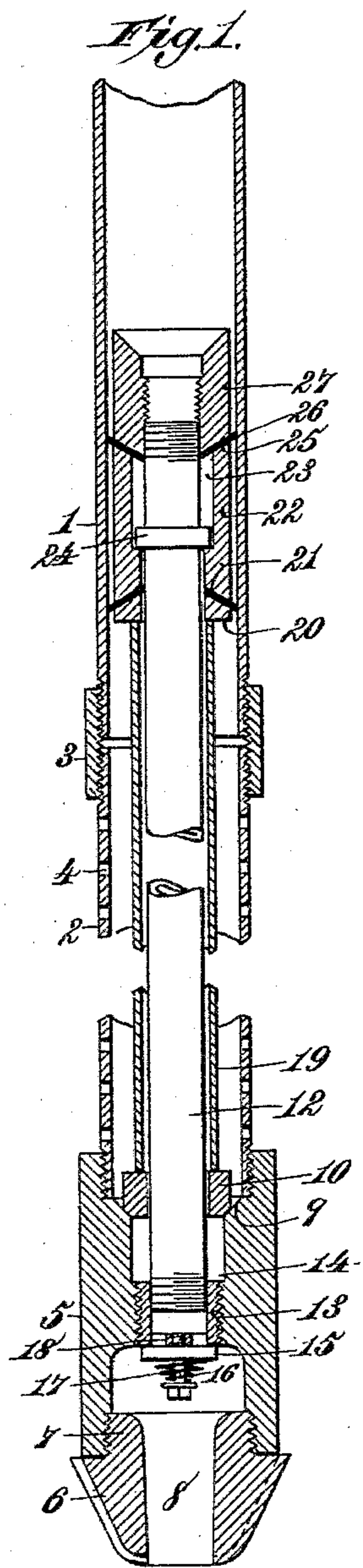
(No Model.)

L. B. HART.

IMPLEMENT FOR BORING WELLS.

No. 411,660.

Patented Sept. 24, 1889.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

LEWIS B. HART, OF PLAQUEMINE, LOUISIANA.

## IMPLEMENT FOR BORING WELLS.

SPECIFICATION forming part of Letters Patent No. 411,660, dated September 24, 1889.

Application filed May 13, 1889. Serial No. 310,527. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS B. HART, a citizen of the United States, residing at Plaquemine, in the parish of Iberville and State of Louisiana, have invented new and useful Improvements in Implements for Boring Wells, of which the following is a specification.

My present invention relates to implements for boring Artesian and other wells; and my object is to provide simple and easily-operated devices for boring, wherein an expansion or other drill or a driven point may be used without withdrawing the auger.

It is also my purpose to provide means whereby the open or hollow auger may be provided with a closing-plug operated by the hydraulic tube, and having such construction that a relief is afforded to the pressure of the pump, while accumulated sediment or débris, either within and above the auger or below the same, may readily be washed away, while by removing the plug a powerful stream may be driven centrally through the auger.

It is my purpose, also, to provide a hydraulic packing formed in two independent parts, which are oppositely inverted, and to combine therewith simple means for placing and removing the said packing.

The invention consists in the novel features of construction and combinations of parts hereinafter set forth, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a central longitudinal section illustrating my invention. Fig. 2 is a similar section showing the position of the parts in removing the packing. Fig. 3 is a sectional view showing the devices for closing the open auger.

In the said drawings, the reference-numeral 1 designates the well-pipe, which is of the usual construction. This pipe is coupled to a strainer 2, of equal diameter, by means of a coupling ring or collar 3, and the strainer is provided with suitable openings 4. Upon the lower end of the strainer is mounted the auger, which consists of a tubular body 5, into which the strainer is screwed. This body extends a suitable distance below the point of attachment, and at its lower end is provided with a female thread, which receives the boring-point or auger proper 6, having a form

substantially resembling the frustum of a cone, inverted, upon the base of which is formed a neck 7, which is threaded to enter the lower end of the body 5. The conical surface of the point is provided with suitable boring-edges, which at the base project slightly beyond the periphery of the body, and a central opening 8 is formed in the point of any desired diameter, the inner or upper end of said opening being slightly flared or expanded, as shown in Figs. 1 and 3.

Within the body 5, and immediately below the end of the strainer 2, is formed a shoulder 9, upon which rests a loose washer 10. This washer loosely surrounds the hydraulic tube 12, which is screwed at its lower end into a nut 13, having upon its exterior face a left-handed thread which engages with a thread formed in the contracted opening 14, passing through the body of the auger. Upon the lower end of this nut is formed a valve-seat, against which rests a valve 15, raised by a spring 16, which is coiled upon a valve-stem 17, screwed into a bar 18 on the nut. Upon the washer 10 rests the end of a sleeve 19, which loosely surrounds the hydraulic tube and rises above the upper end of the strainer 2, its upper extremity supporting a collar 20, having its upper face dressed off to an approximately conical form. This collar supports an annular hydraulic packing 21, which closely surrounds the hydraulic tube and forms a tight joint with the well-tube, its edge projecting slightly beyond that of the collar supporting it. Upon the packing 21, which may be formed of leather, rubber, or other suitable material, rests a sleeve 22, the lower end thereof being concaved at an angle corresponding with the inclination of the surface of the collar 20. The upper end of this sleeve is provided with an interior recess 23, which receives a collar 24, shrunk or otherwise rigidly secured upon the hydraulic tube, and at its upper extremity this sleeve is provided with a concave seat 25, similar to that within its lower end. Upon this seat rests a second hydraulic packing 26, similar in all respects to that below, but oppositely inverted by reason of the opposite inclination of the concave seats at the ends of the sleeve 22.

The upper packing is confined in position by an annular coupling 27, having its lower



end dressed off to fit the concave seat in the end of the sleeve, and the hydraulic tube is connected to this coupling by a screw-thread. The nut is countersunk above to guide the connecting-joint to the thread as it is inserted from above.

The opening in the auger-point may be closed after removing the valve and valve-seat from the body of the auger by means of a hollow plug 28, screwed by a left-hand thread upon the end of the hydraulic tube. This plug is rounded at its end and is provided with openings 29, which are closed when the plug is seated in the opening 8; but at the upper end of the plug are formed a series of openings 30, which remain unobstructed and discharge continuously within the body of the auger, thereby relieving the pressure of the pump should the latter remain running after the plug is seated and removing sediment and sand from the seat.

In removing the packing the tubular nut 13 is disconnected and the hydraulic tube is raised, the collar 24 thereon striking the upper packing 26 upon its inner edge, which closely surrounds the hydraulic tube, and thereby inverting it, as shown in Fig. 2, whereupon the parts may be removed without difficulty.

I may at any time remove the lower valve and valve-seat and insert an expansion-drill through the section of the hydraulic tube to assist in clearing away any debris at the bottom. Moreover, by removing the hydraulic apparatus altogether I have free access for either driving or drilling below the cutting-point. The construction shown also enables me to attach the suction devices at any point and try for water, which will pass up through the strainer and outside the upper packing 26 to the surface without taking the hydraulic apparatus out. For this purpose the lower packing 21 should be omitted, and in most cases this may be done without injury, as the upper packing will answer every purpose.

I may omit the lower spring-raised valve altogether and use an open pipe to carry the water to the cutting-point, and in this case, also, the expansion-drill may be used by passing it through said pipe and through the opening in the auger. I may also use a single packing only instead of two, by omitting the lower packing shown. The opening 8 in the auger may be of any desired diameter.

In inserting the packing from above it slides downward in the pipe readily when its convex face is turned in the direction of movement. Upon reaching the proper point the hydraulic tube 12 is raised until the end of the sleeve 19 brings the collar 20 into contact with the lower packing, whereby the latter is inverted, as shown in Fig. 1. The tube is then lowered and the nut 13 screwed into place.

The hydraulic plug 28 is provided with openings 29, in order that the water issuing

therefrom may wash away all sediment from the opening in the point as the plug enters.

Being very slightly tapered, the openings are not closed entirely until the plug is fully inserted, and even then the upper openings 30 are allowed to partly project, in order that the water may pass up in the casing to keep the pressure off the pump, if the latter is not stopped soon enough when the other openings are closed in the seat occupied by the plug.

What I claim is—

1. In an apparatus for drilling wells, the combination, with a well-tube and strainer, of an auger having a cutting-point approximating in form an inverted frustum of a cone and provided with a central opening having its upper end expanded, a hollow plug having openings above its closed rounded extremity, a hydraulic tube carrying said plug, and a packing in the pipe through which said tube passes, substantially as described.

2. In an apparatus for drilling wells, the combination, with a well-tube and strainer, of an auger having a point provided with a central opening, and a hollow plug mounted on the end of the hydraulic tube and provided with openings, part whereof lie above the opening when the plug is seated and discharge within the body of the auger, substantially as described.

3. In an apparatus for drilling wells, the combination, with the well-tube and strainer, of an auger having a body portion with a contracted central opening, a cylindrical nut screwed into a threaded seat in said opening and having a check-valve upon its lower end, a hydraulic tube screwed into said nut, and a boring-point screwed into the body below the valve and having substantially the shape of a frustum of a cone, provided with a central opening, substantially as described.

4. In an apparatus for drilling wells, the combination, with the well-tube and strainer, of an auger having a central opening extending entirely through the same, a hydraulic tube tapped into a nut carrying a spring-raised valve, said nut connected with the auger by a left-hand thread, a washer resting on a shoulder in the auger, a sleeve resting on the washer, a sleeve surrounding the hydraulic tube above the strainer and having concave or countersunk ends and provided with a recess in its upper end receiving a collar on said tube, flexible packings lying in the concave ends of the sleeve, a collar having a conical face and lying between the lower packing and the supporting-sleeve, and a coupling connected to the hydraulic tube and having a conical face resting on the upper packing, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

LEWIS B. HART.

Witnesses:

C. N. ROTH,  
LUCIEN GRASS.