(No Model.)

L. V. ELDER.

WELL BORING APPARATUS.

No. 421,486. Patented Feb. 18, 1890.

Fig. 1.

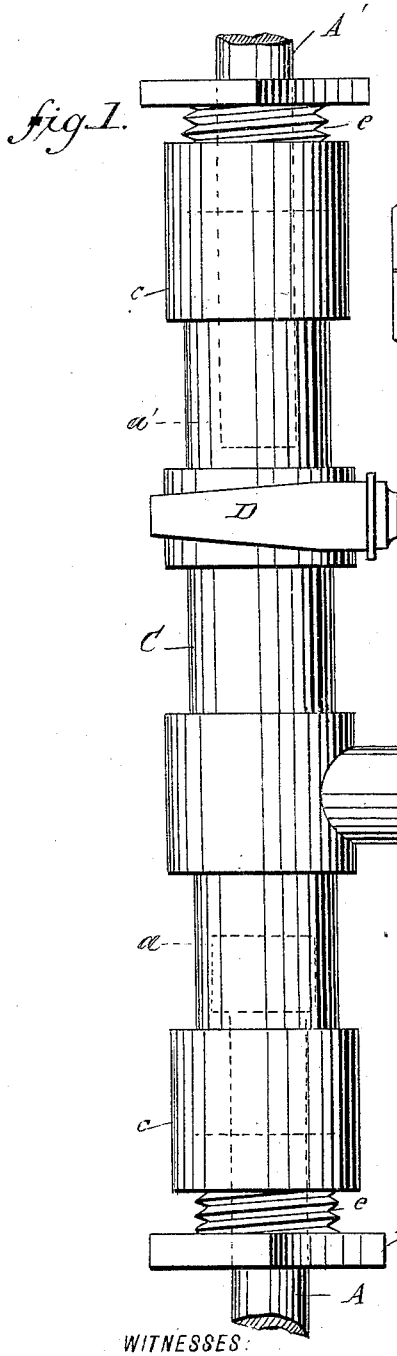


Fig. 3.

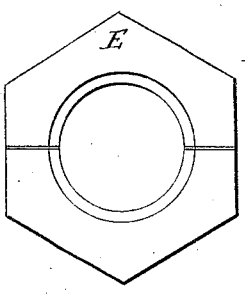


Fig. 4.

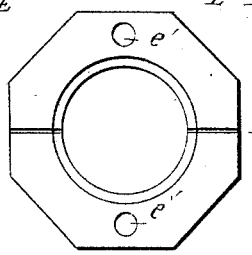
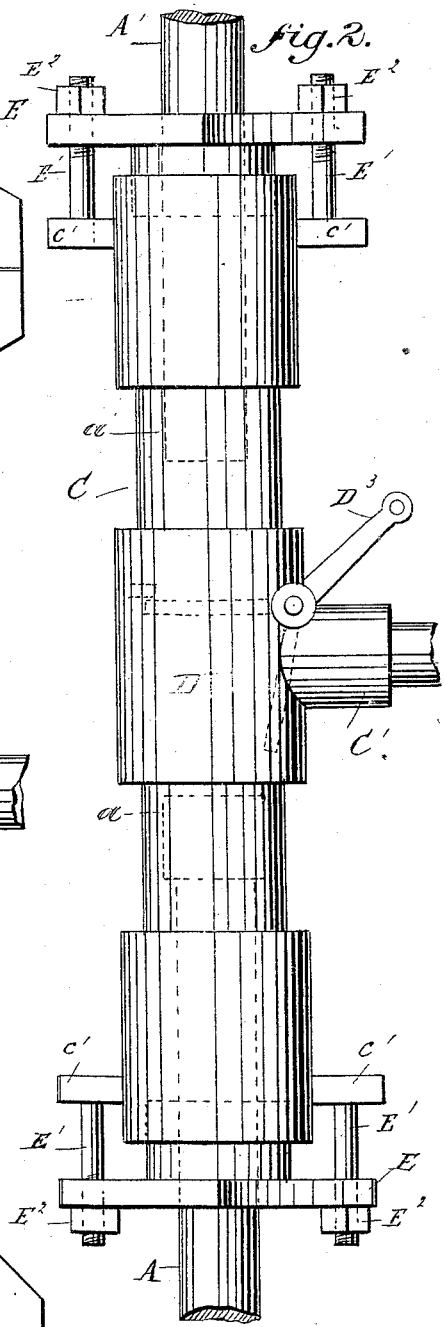


Fig. 2.



WITNESSES:

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WELL-BORING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 421,486, dated February 18, 1890.

Application filed April 2, 1889. Serial No. 305,647. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE V. ELDER, of New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Well-Boring Apparatus, of which the following is a full, clear, and exact description.

The invention relates to that class of apparatus employed in sinking wells by abrading the earth by means of a stream of water injected into the well-shaft or boring under pressure, the invention having special reference to the means employed for establishing temporary communication between the well pipe or tubing and the pumps to maintain an uninterrupted flow of the water to the well-shaft while adding a new section to the tubing.

The object of the invention is to so improve such temporary connecting devices as to enable the sections to be added more expeditiously than heretofore, and also to simplify and cheapen the temporary coupling devices.

The invention consists in providing the well-pipe with a temporary coupling device for the successive sections longitudinally movable on the pipe from one section to the other without the necessity of removing the said coupler.

The invention consists, also, in the novel construction and arrangement of parts, as hereinafter particularly described, and pointed out in the claims.

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

Figure 1 is an elevation of coupling devices embodying my invention, showing the same in connection with the upper end of the well-pipe and an additional section about to be added. Fig. 2 is a similar view illustrating a slightly-modified form of the invention, and Figs. 3 and 4 are plan views of different forms of packing-glands.

Referring to the parts, A represents the upper end of a well pipe or tubing, and A′ the lower end of a section about to be added.

The temporary coupling pipe or sleeve C is formed with an induction opening or branch C′ intermediate its ends, the sleeve and its branch C′ forming essentially a T. Above or adjacent to its induction-pipe C′ the coupling-pipe C is provided with a valve-chamber D, in connection with which is arranged a suitable gate-valve for closing the bore of said coupling-pipe. This valve in the construction shown in Fig. 1 is of the ordinary sliding form, operated by turning the valve-stem D′ thereof by its hand-wheel D^2. In the form shown in Fig. 2 the valve is of the hinged or flap variety, and is operated by the crank-handle D^3, the open and closed position of the valve being indicated by dotted lines.

Any suitable manner of forming a water-tight joint between the coupling-pipe and the well-tubing sections may be followed in practice; but I greatly prefer to employ a gland, as shown. In Figs. 1 and 3 is shown a gland consisting of a split nut E, the external threads *e* of which take into corresponding internal threads formed on the ends *c* of the coupling-pipe C, which gland forms, in connection with a suitable fibrous or other packing material, when the latter is also desired, the desired water-tight joint. In the form shown in Figs. 2 and 4 the gland E is not threaded, but is formed in the flange thereof with bolt-holes *e*′, through which bolts E′ pass, the bolts engaging or being formed upon lugs *c*′ on coupling-pipe C. By tightening the nuts E^2 of the bolts the gland may be forced home to form the water-tight joint, fibrous or like packing being also employed, if desired. In either case I prefer a two-part or split gland, whereby it may be quickly removed in shifting the coupling-pipe.

In practice, before starting the pump or other source of water-supply, the coupling-pipe is placed on the upper end of the well-tubing, with its upper end projecting above the latter, and the joint of the said lower end of the coupling-pipe, with the well-tubing, is made water-tight by means of a gland E or otherwise. The stream of water may now be directed into the tubing either through the lateral induction-opening C′ of the coupling-pipe or directly through the upper end of the last section of tubing, preferably the latter. When it is desired to add an additional section, as A′, to the well-tubing A, the stream of water is directed through the side induction-opening C′, if not already flowing there-

through, the valve D being now closed to effect a closure of the upper end or portion of the tubing A. The lower end of the new section A′ is entered through the upper end of the coupling-pipe, if desired, as far as the valve therein, and a water-tight joint is made between the said new section and the coupling by the upper gland or other packing, and the new section connected by its upper end with the pump. The water is now directed through the new section and cut off from the induction-opening C′, the valve in the coupling-pipe having been opened, and the said new section is moved downward and turned until it makes a direct connection with the upper end of the preceding section, whereupon the glands of the coupling-pipe are removed and the latter shifted longitudinally along the new section to the upper end thereof in position to be quickly utilized in adding another section.

The permanent joint of the several pipe-sections may be effected by causing the lower end a' of the new section to enter and engage the enlarged upper end a of the preceding section, the said opposing ends being formed, of course, respectively, with external and internal threads. The enlarged internally-threaded end a of one section may, it is evident, consist of a separate coupling piece or ring, if desired. The coupling-pipe being movable along the tubing from one section to the other, it is not necessary to divide the said coupling-pipe longitudinally into two half-sections, as has been previously done; but it may be cheaply produced, as shown, in one piece—that is, of unbroken peripheral continuity.

By means of this invention it will be seen that the connection of each succeeding section may be effected with great dispatch, and the parts of the coupling devices and the steps of effecting the coupling being few and simple even an unskilled person may be relied on to attend to the work.

The means of supporting the tubing may be of the ordinary form, as also the pumps and general connections.

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

1. In well-sinking apparatus of the character described, the well pipe or tubing having its coupling attachments that temporarily unite the successive sections movable on and along the tubing from one section to the other, substantially as described.

2. In well-sinking apparatus of the character described, a means of establishing temporary connection between a new section of tubing and the next preceding one, consisting of a valved pipe having an induction-opening intermediate its ends and movable longitudinally on the tubing from one section to the other, substantially as described.

3. In a well-sinking apparatus of the character described, the combination, with the well-tubing, of a means for establishing temporary connection between a new section of tubing and the preceding one, comprising a sleeve or pipe movable along the tubing from one section to the other and provided with an induction-opening intermediate its ends, a gate-valve in said sleeve for closing the bore thereof, and packing-glands for forming a tight joint between the said sleeve and tubing, substantially as described.

4. The herein-described temporary coupling for the purpose specified, consisting of an unsplit sleeve having a side induction-opening and provided with a valve for closing the bore of the sleeve, the said bore being otherwise unobstructed to enable it to be passed along the pipe-sections, substantially as described.

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Witnesses:
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