(No Model.)

C. E. KELLS.

APPARATUS FOR THE FORMATION OF DEEP WELLS.

No. 386,987. Patented July 31, 1888.

Fig. 2.

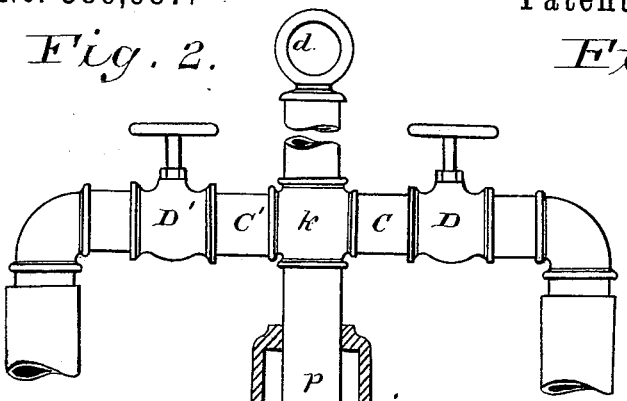


Fig. 1.

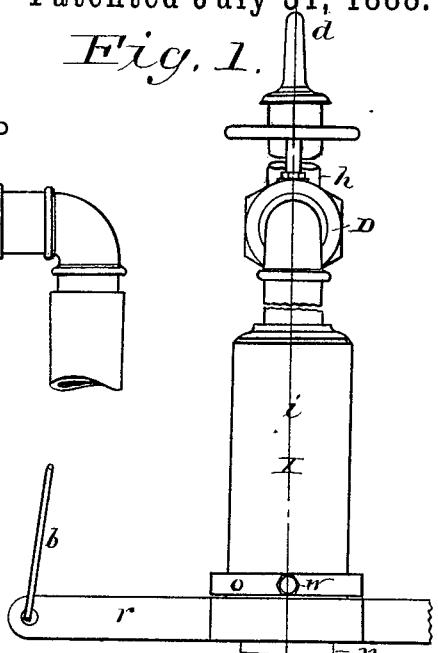


Fig. 3.

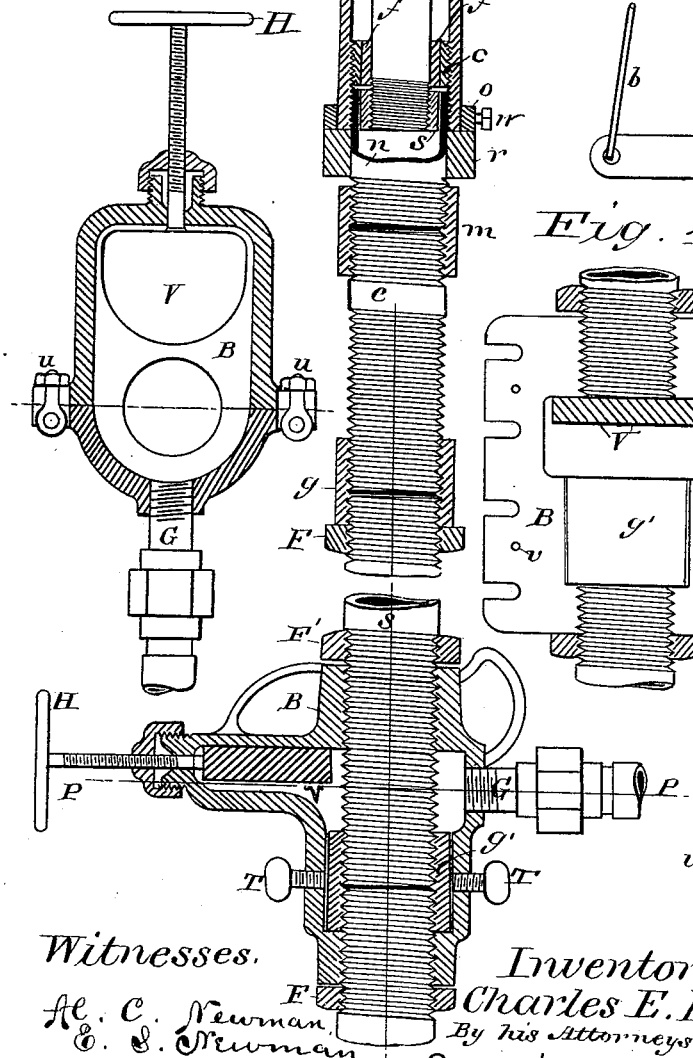
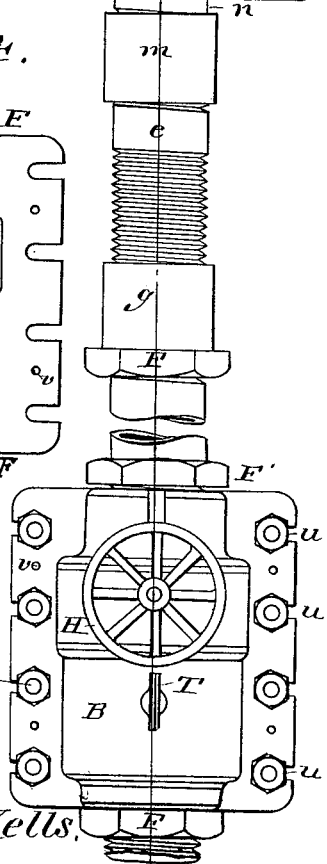


Fig. 4.



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APPARATUS FOR THE FORMATION OF DEEP WELLS.

SPECIFICATION forming part of Letters Patent No. 386,987, dated July 31, 1888.

Application filed September 19, 1887. Serial No. 250,151. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. KELLS, a citizen of the United States, residing in the city of New Orleans, parish of Orleans, and State of Louisiana, have invented a new and useful Apparatus for the Formation of Deep Wells, of which the following is a specification.

My invention relates to improvements in a device or apparatus of the class for sinking a pipe through the different strata of earth for the purpose of forming wells by means of forcing water through a pipe and abrading the earth and washing a hole or opening through which the pipe passes; and the object of my invention is to provide improved means by which a continuous stream of water is maintained in the pipe, so as not to allow the agitated substances to subside or settle, or to interrupt the progress of the washing process during the operation of connecting the sections of pipe, &c. I attain this object by the mechanism illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my apparatus when a new section has just been connected and the split-valve chamber is ready to be removed. Fig. 2 is a sectional plan on plane X X, Fig. 1, showing position of parts when a connection is made and a split-valve chamber is about to be removed. Fig. 3 is a transverse section on plane P P, Fig. 2, showing position of valve when opened to allow pipe to pass into the coupling. Fig. 4 is a sectional plan on plane S S, Fig. 2.

Similar letters refer to similar parts throughout the several views.

Swivel apparatus, by way of which water is forced into the sections of pipe, is constructed as follows: A pipe, *p*, has a stop, *s*, at its lower end, formed by a collar screwed thereon which bears upward against a collar, *c*, secured to the inside of the swivel-casing *i*. Between this collar *c* and pipe *p* is placed a follower, *f*, which keeps in position the packing placed in the space *a*. The casing *i* of the swivel is secured to a nipple, N, which nipple is connected by the coupling M to the lower nipple or pipe, *e*, which has a thread about six inches long (more or less) cut on the lower end of the same to receive the split-valve chamber B, when it is desired to add another section of pipe. This lower nipple or pipe, *e*, is connected with the top of section of piping by the coupling *g*, which coupling is enveloped in the split-valve chamber B when a new section is to be added, as further on explained. The sustaining-bar *r* is placed loosely on the outside of nipple N, and is kept in position by the collar *o*, provided with set-screw *w*, as shown. Chains or rods *b* are secured to the ends of the bar *r*, and extend to the derrick for sustaining the pipe in position, &c. A chain for sustaining the pipe may be placed in eyebolt *d*, on top of the extension *h* of the swivel-pipe *p*, if desired. The pipe-extension *h* forms an air-chamber.

Connected to the swivel-pipe by the connection *k* are two induction-pipes, C C′, provided with valves D D′ and the necessary elbows, &c., for connections with pump.

The induction-pipe C is connected with the pump, and when valve D is opened a stream of water is forced through the water-swivel and throughout the whole length of pipe.

The induction-pipe C′ is for the purpose of being connected with a closed tank filled with sand, clay, or other materials, which may be desirable to have forced into the pipe to assist in abrading, cutting, or luting the opening in the earth for the pipe.

The split-valve chamber B is shaped as shown in the plan view, is provided with internal screw-threads in its opposite ends, and is divided in the center, so as to allow the same to be placed over the pipe and connections, as shown in Fig. 2, and the parts are secured together in position by the hinged bolts *u u*. Dowel-pins *v v* are provided to guide the parts together, so as to fit the threads of pipe exactly.

The slide-valve V, operated by the hand-wheel H, is arranged to open, so as to allow the pipe to pass through the valve-chamber B to screw into the coupling *g*′. This coupling *g*′ is maintained in position by the set-screws T. The induction-pipe G, which is provided with a suitable valve, is placed in the split-valve chamber B, as shown, through which a stream of water is admitted from the pipe G, when the valve V is closed, and the stream, passing through the swivel-pipe, is shut off during the operation of attaching a new section of pipe.

Jam-nuts F F′ are placed one on top and one on the bottom of each section as they are added. The nut F′ on the bottom end is placed

on the long thread, and is run up out of the way on that section to which another section is to be coupled, and when the connection is completed and the valve-chamber removed it is run down and secured against the top of the coupling g'. The jam-nut F on top end of added section is put on pipe before the coupling g, and when valve-chamber is put on to make the connection with a new section this jam-nut F is secured against lower end of the valve-chamber B, as shown, to prevent any leak. When the new section is coupled and the valve-chamber B is removed, this nut F is secured against the lower side of the coupling g'.

Having thus described the construction of my improved apparatus for forming deep wells, the operation is as follows: A section of two or three lengths of pipe are secured together by couplings. The top end of the section is secured by the coupling g to the nipple e of the swivel apparatus, a jam-nut, F, being placed on the under side of the coupling g. The bottom end of the section has a thread, six inches long, more or less, and a jam-nut screwed on this thread. When the section is thus constructed, it is drawn up in the derrick by the chain b, attached to the swivel-bar r or to the eyebolt d. When the section, as above described, is drawn up in the derrick, plumbed, and placed in proper position, the long thread on bottom end of section is entered and screwed into the upper end of the valve-chamber B until the end of section reaches the valve V, when the stream is turned on and flows through the swivel-pipe, and the valve V is opened, the stream, which at times flows through the induction G, being turned off. Then the pipe is screwed through the valve-chamber B and enters the coupling g', when the coupling is made. Then the bolts $u\,u$ of the split-valve chamber B are loosened and the valve-chamber B removed, and the jam-nuts F and F′ are screwed up to the coupling g', when this section, which has just been added, has been sunk in the ground and a new section is required to be added. The split-valve chamber B is placed over the coupling g and thread of nipple e of the swivel apparatus in the same manner as it is shown in connection with the coupling g' in Fig. 2. The swivel apparatus is then revolved and the nipple e screwed out of the coupling g and through the valve-chamber B until the end of the nipple e is past the valve V. When a stream is turned on to flow through the induction G, the valve V is closed and the stream flowing through the swivel-pipe is turned off. Then the nipple e is removed from valve-chamber B and attached to the upper end of another section of piping, which at its lower end is attached, in the manner above described, to the top of the section below by the aid of the split-valve chamber. The operation of making connection is thus carried on without the least interruption of the flow of water through the pipe.

The induction-pipe C′ is connected with a tank provided with a man-hole, through which sand, clay, or other materials are placed in the tank, and are forced into the pipe by the pump. The materials placed in tank and forced through the pipe are calculated to assist in the operation of making a way for the passage of the pipe. If the pipe is going through a stratum of clay, a certain amount of sand or other gritty materials mixed with the stream through the pipe will assist in abrading or cutting the clay; or if going through a stratum of porous sand, which absorbs the water too freely, a luting of clay, mixed with the stream passing through pipe, will assist in retaining the water and secure the desired results.

The pump for forcing the water through the pipe is placed at any convenient place, and, in obvious way, is connected by its valved pipes with the inductions C, C′, and G, so that, if desired, a stream can pass through all three, simultaneously or separately.

Having thus described the construction and operation of my apparatus for the formation of deep wells, I claim as new and desire to secure by Letters Patent—

1. The combination of the split-valve chamber provided with the induction-passage and having the internal screw-threads at its opposite ends to engage the adjacent threaded ends of the two pipes, its valve, and the clamping-bolts to secure its parts about the pipe ends with its threads fitting the threads on the pipe ends, substantially as and for the purpose set forth.

2. The combination of the split-valve chamber provided with the induction-passage and having the internal screw-threads at the opposite ends, the valve sliding crosswise of the valve-chamber, the clamping-bolts, the threaded coupling within the valve-chamber, and the pipe sections having threads for engaging the threads of the coupling and those at the ends of the valve chamber, substantially as and for the purpose set forth.

3. The combination of the swivel apparatus provided with the pipe p, the induction-passage (or passages) connecting therewith, the threaded nipple or pipe e, having connection with the lower end of the pipe p, the coupling connected with the lower end of the nipple or pipe e, the pipe-section connected with the coupling, the split-valve chamber provided with the induction-passage and having the internal end threads for engaging the nipple or pipe e and pipe-section threads, the slide-valve, the induction-passage G, the means for clamping the sections of the valve-chamber together, and a set screw or screws engaging the valve-chamber with the coupling, substantially as and for the purpose set forth.

CHARLES E. KELLS.

Witnesses:
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M. W. RAINOLD.