

No. 650,318.

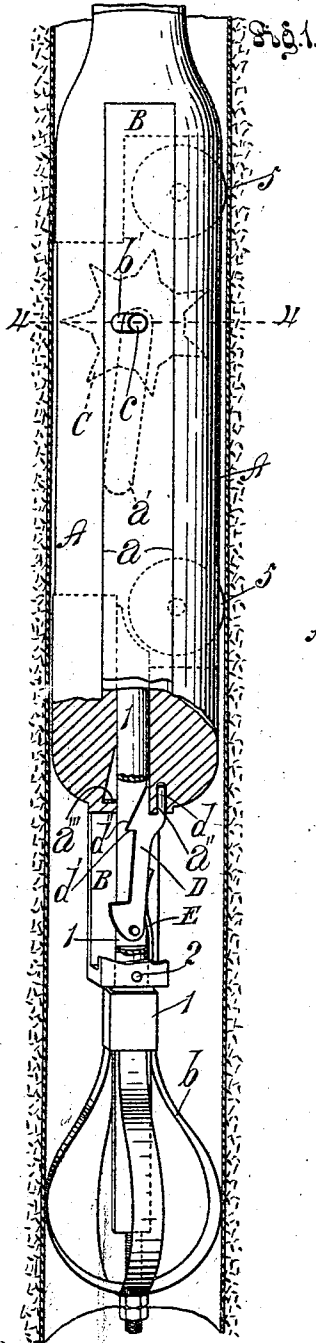
Patented May 22, 1900.

E. A. HARDISON.

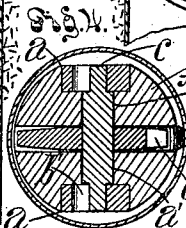
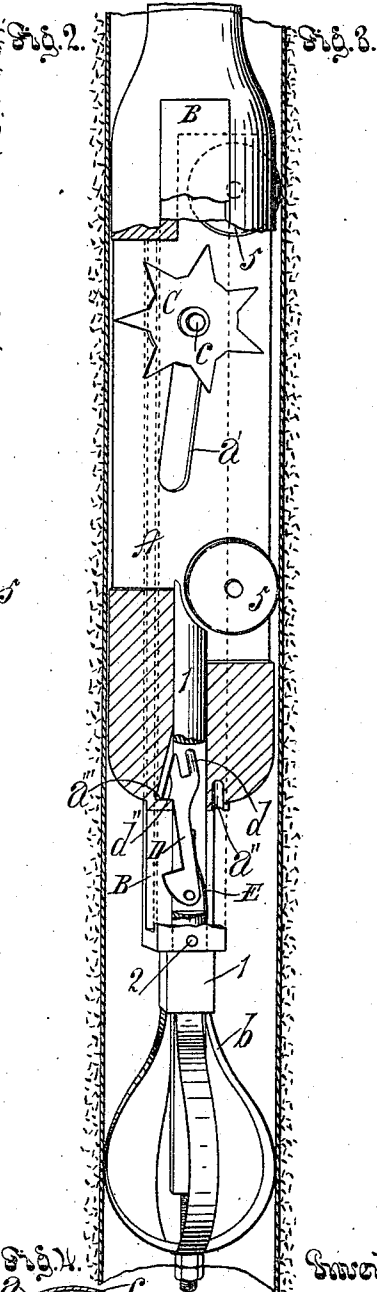
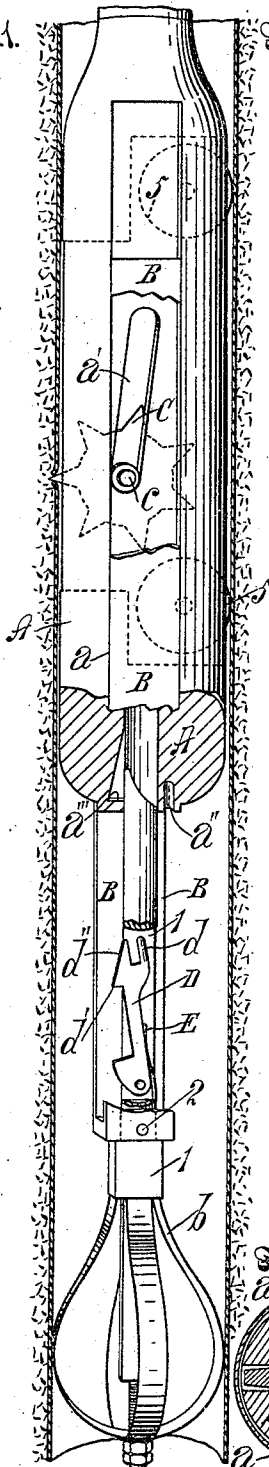
AUTOMATIC CASING PERFORATOR FOR DEEP WELLS.

(Application filed Aug. 31, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

EDWIN A. HARDISON, OF SANTA PAULA, CALIFORNIA, ASSIGNOR OF ONE-HALF TO WALLACE L. HARDISON, OF SAME PLACE.

AUTOMATIC CASING-PERFORATOR FOR DEEP WELLS.

SPECIFICATION forming part of Letters Patent No. 650,318, dated May 22, 1900.

Application filed August 31, 1899. Serial No. 729,116. (No model.)

To all whom it may concern:

Be it known that I, EDWIN A. HARDISON, residing at Santa Paula, in the county of Ventura and State of California, have invented a new and useful Automatic Casing-Perforator for Deep Wells, of which the following is a specification.

My invention relates to casing-perforators with which to perforate the casings in deep wells—such, for instance, as oil-wells and Artesian wells for supplying water. In such wells it is desirable to perforate the well-casing at the point or points between the top and bottom of the well at which the oil or water bearing strata, as the case may be, is found—that is to say, it often occurs in sinking a well that the same will pass through one or more oil or water bearing strata, and in the case of oil-wells it is necessary to perforate the casing at the oil stratum or strata between the top and bottom of the well and to leave the casing intact at the water-bearing strata, thus to prevent the water from entering the casing and at the same time to allow the oil to enter the casing. In the case of Artesian or other bored wells for supplying water, it is necessary to perforate the casing at the water-bearing strata in order to allow the water from such strata to flow into the casing, thus to make the well afford the largest possible supply of water.

The object of my invention is to provide a casing-perforator which can be lowered to any depth in a well and then can be operated to perforate the casing automatically.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation of my newly-invented casing-perforator in a well and with its parts in position to be lowered into the well. A portion of the lower end of the body is shown in vertical mid-section. Fig. 2 is a view of the perforator in a well and with parts in position for perforating the casing. In this view a portion of one bar of the slide is broken to show the other bar. Fig. 3 is a view of the casing-perforator in the well and with parts in position for withdrawing from the casing. In this view the body is shown in vertical mid-section except at the top. Fig. 4 is a sectional plan of the casing-perforator on line 4, Fig. 1.

A indicates the casing-perforator body, provided with a slideway *a*, which is parallel with the axis of the body, and also provided with a guideway *a'*, which is oblique to the slideway *a*. The body is also provided at its lower end with a latch-withholding catch *a''* and with a latch-catch *a'''*.

B indicates a wheel-carrier slide to slide in the slideway *a* and provided at its lower end with a friction device *b* to engage the casing to temporarily hold the slide stationary with relation to the body of the perforator, said slide being also provided at its upper end with a transverse slot *b'* to extend across the guideway *a'*.

C indicates the perforator-wheel provided with an axle *c* of two diameters, the outer ends of the axle being smaller than the portions close to the wheel. The guideway *a'* is wider than the transverse slot *b'*, and the axle is set with its larger diameter in the guideway and with its smaller diameter in the transverse slot.

D indicates a latch pivoted to the slide and provided at its upper end with a retaining-finger *d* and with a hook or catch *d'*.

In practical operation when the tool is to be lowered into the casing the friction device *b* will be inserted into the casing and the tool lowered somewhat, thus causing the body to descend along the slide B, and at the same time the latch D is held to cause the finger *d* to engage the latch-holding catch *a''*, so that the latch is held out of its catching position. E indicates a spring to engage the latch and to throw the latch to catch upon the catch *a'''*. As the tool is lowered down the casing the friction of the device *b* holds the slide up, with the latch-finger *d* in engagement with the latch-retainer *a''*. When the tool has reached the desired place in the casing, the body A will be drawn up and the weight of the slide and the friction device *b* will hold the slide from immediately following the body of the tool, and as the body of the tool rises the wheel C, being acted upon by the wall of the guideway *a'*, is driven to one side, thus to project the spurs of the perforating-wheel outward to perforate the casing, as indicated in Fig. 2. The body of the tool is then drawn up and the points of the

wheel pierce the casing at intervals until the line of perforation has been made to the proper height. Then the tool will be lowered a short distance and the friction device *b* will temporarily hold the slide, thus allowing the body to come down and to engage the oblique face *d'* of the latch, thus throwing the latch back until it has entered the body of the tool far enough to allow the spring *E* to throw the latch to bring the shoulder or hook *d'* over the shoulder or catch *a'''*, which securely locks the slide to the body of the perforator, as indicated in Fig. 3. Then the tool may be drawn upward out of the casing, and when it has reached the top the latch may be thrown back and the slide allowed to fall to withdraw the latch from the body and to allow the finger *d* to be again brought into the position shown in Fig. 1.

By preference the friction device is fixed at the lower end of a rod 1, which is fastened to the carrier or slide B by a pin 2 and passes up into the body A. The latch is pivoted to such rod, which is practically a part of the slide or carrier B.

5 indicates anti-friction-rollers to engage the casing to hold the body against the thrust of the perforator.

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

1. A casing-perforator comprising a body provided with an oblique way; a perforating-wheel having its axle mounted to run in such way; a sliding wheel-carrier in which the axle of the wheel is journaled to rotate; a friction device connected with the wheel-carrier to engage the casing to temporarily hold the wheel-carrier stationary with relation to the

body of the perforator; a latch pivoted to the wheel-carrier to hold the wheel-carrier in its elevated position with relation to the body; and means for temporarily holding the latch out of engagement with its catch on the body of the perforator.

2. A casing-perforator comprising a body provided with a slideway parallel with its axis and with a guideway oblique to the axis of the slideway, and also provided at its lower end with a catch for the latch and with a latch-holding catch; a perforating-wheel carrier to slide in the slideway and provided with a transverse slot; a perforating-wheel provided with an axle to run in the guideway and slot; a friction device connected with the carrier to engage the casing to hold the carrier stationary with relation to the body of the perforator; and a latch pivoted to the carrier and provided with a finger to catch the latch-locking catch and provided with a hook to hook upon the latch-catch of the body.

3. In a casing-perforator, the combination with a body provided with a latch-withholding catch; of a perforator-carrier slide mounted to slide with relation to such body; a latch pivoted to such slide and provided with a finger to engage the latch-withholding catch at one position and provided with a hook or shoulder to engage with the latch-retaining catch at another position of the latch; and means for holding the latch normally toward the latch-retaining catch.

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