No. 674,191. Patented May 14, 1901.

C. F. ALLEN & W. B. GROW.

DRIVE WELL DEVICE.

(Application filed July 28, 1900.)

(No Model.)

Fig. 1.

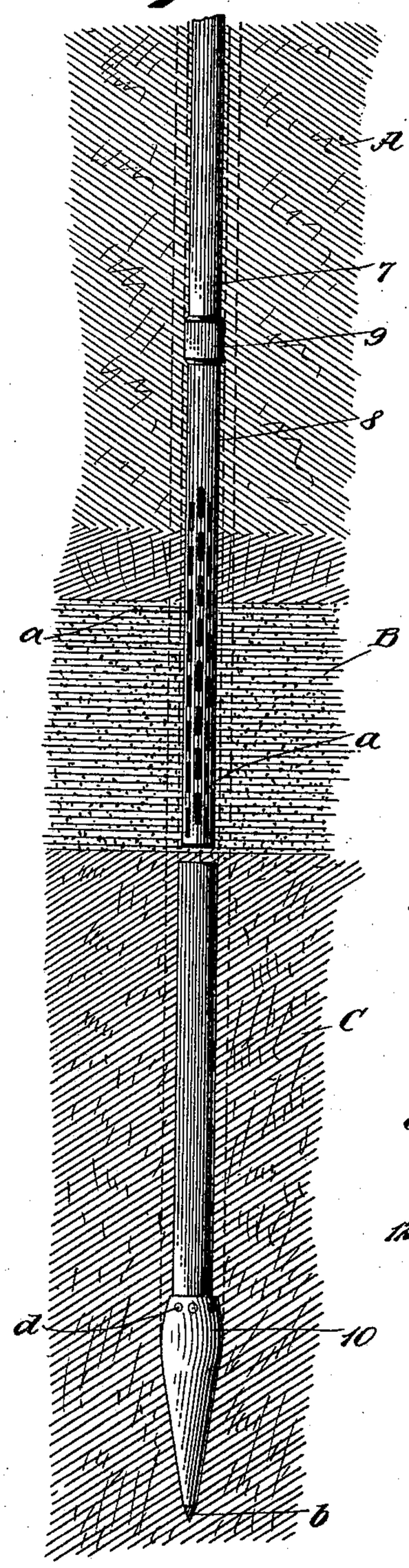


Fig. 2.

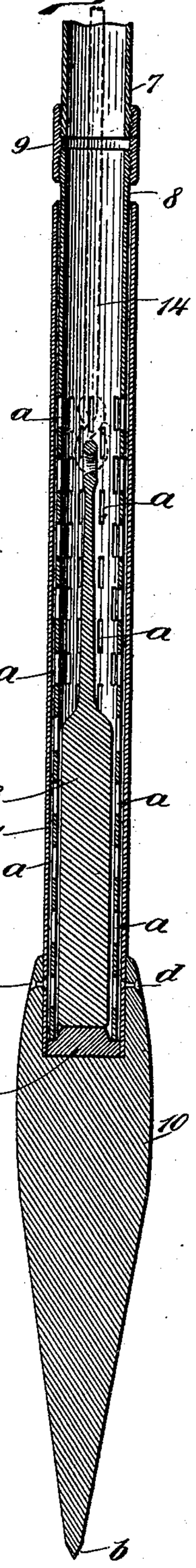


Fig. 3.

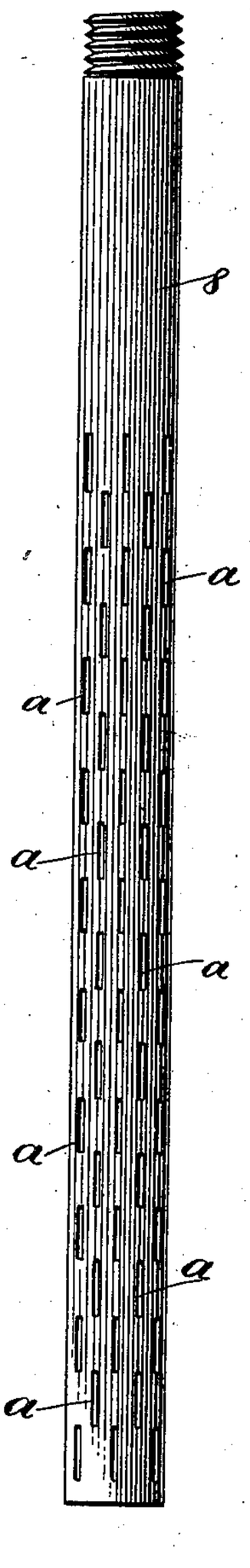


Fig. 4.

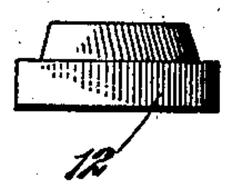


Fig. 5.

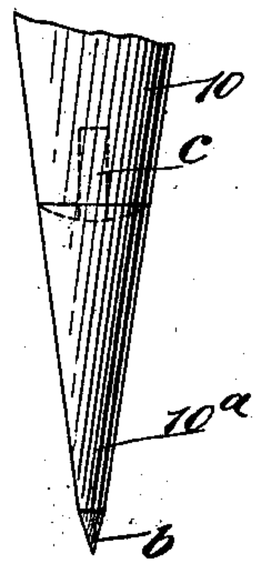
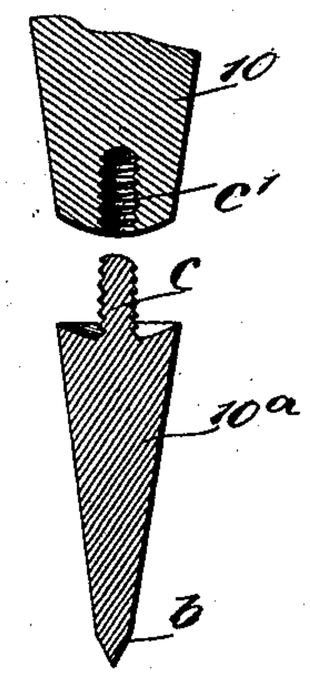


Fig. 6.



WITNESSES:

H. G. Dieterich

Wm. P. Patton

INVENTORS

Charles F. Allen.

William B. Grow.

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES F. ALLEN AND WILLIAM B. GROW, OF HUENEME, CALIFORNIA, ASSIGNORS OF ONE-HALF TO LUNDY B. HOGUE, OF SANTA PAULA, CALIFORNIA.

DRIVE-WELL DEVICE.

SPECIFICATION forming part of Letters Patent No. 674,191, dated May 14, 1901.

Application filed July 28, 1900. Serial No. 25,110. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. ALLEN and WILLIAM B. GROW, citizens of the United States, and residents of Hueneme, in the county of Ventura and State of California, have invented a new and Improved Drive-Well Device, of which the following is a full, clear, and exact description.

This invention relates to a class of wells comprising a tubular casing having a pointed lower end, which is driven into the ground until water is reached, thus providing a water-supply that may be pumped from the completed well.

Ordinarily driven wells are inserted into the ground by the impact thereon of a heavy weight upon the upper end of the well-casing. This method of driving the well frequently injures the upper end of the tubular casing, and in the event that no water is found the casing and its point are lost, as the excessive friction of the earth on the wall of the casing prevents its withdrawal from the ground without the expenditure of more time and labor than the worth of the parts warrants.

One object of our invention is to provide novel features of construction in a device of the indicated character which will permit the free and rapid insertion of the well-casing into a vertical perforation in the ground without injury to the casing and also allow the casing to be readily withdrawn, if desired.

A further object of the invention is to provide a novel point for the lower end of the well-casing and convenient means for driving said point independently of the main portion of the well-casing, producing a vertical hole of greater diameter than that of the casing, which will permit the introduction of the casing into the well-hole by gravity or by force applied thereto and permit ready removal of the casing independently of the point, if desired.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended claims.

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

Figure 1 is a side view of the improvement inserted in the ground. Fig. 2 is an enlarged sectional elevation of the lower portion of the well-tube and features of the invention thereon. Fig. 3 is a side view of the perforated lower portion of the casing that is attachable to the main part thereof. Fig. 4 is a side view of a cushion-block employed. Fig. 5 is a side view of the lower portion of an improved drive-point having features of improvement, and Fig. 6 is a sectional side elevation of the details of the point shown in Fig. 5.

In the drawings which illustrate the invention and its application, 7 indicates in part the tubular well-casing, which in complete form is composed of a number of sections joined together endwise, as is usual in tubular well-casings. Upon the lower end of the unperforated tubular well-casing 7 a tubular extension-piece 8 is joined thereto by means of an interiorly-threaded thimble 9, into which screw the threaded ends of the casing-sections 7 8, holding them detachably connected, as best shown in Fig. 2. The casing-section 8 is numerously perforated throughout its area, and preferably these perforations *a* are in the form of longitudinally disposed and spaced slots, as clearly represented in Fig. 3.

The improved point 10, that forms the lower end of the drive-well device, may be shaped as shown in Figs. 1 and 2 or as indicated in Figs. 5 and 6. The body of the point 10 is formed of suitable metal—such, for example, as malleable iron—and if made of a single piece of metal, as shown in Figs. 1 and 2, consists of an elongated block having a solid body substantially barrel-shaped in its upper portion and conically extending therefrom to provide a sharp lower end *b*. If the point 10 is solid, or, in other words, made of one piece of metal, its lower end may be hardened to render it durable; but, if preferred, a hardened point-section 10^a may be employed of hardened tool-steel and adapted to better withstand contact with stones that it may impinge upon in its downward passage into the ground. The securable point end 10^a

is shown in Fig. 5 as attached to the body of the portion 10 and in Fig. 6 as detached therefrom, and as represented in the latter figure said part 10^a is furnished with a screw-stud *c*, adapted to engage a threaded socket *c'*, formed in the lower end of the body portion 10 and when screwed therein will hold the point end 10^a in serviceable connection with the body 10.

In the upper end of the point 10 a socket is axially formed of sufficient depth to adapt it to receive the lower end of the tubular shield 11, said end of the shield being secured within the socket by screws or rivets *d*, as shown in Fig. 2. The interior diameter of the tubular shield 11 is so proportioned that the shield may be slid over the lower edge of the casing-section 8, and the length thereof is sufficient to cover the perforations *a* of said casing-section, as clearly shown in Fig. 2.

In the axial socket in the upper end of the point-body 10 a circular cushion-block 12, formed of any suitable material, is seated, said block serving to prevent injury to the metal point-body when it is driven into the ground.

In water-bearing soil at a certain depth from the surface the stratum of water that permeates the soil may mingle with sand and rest upon a substratum of clay, as shown sectionally in Fig. 1.

In order to drive the point 10 down into the clay, we provide a hammer-block 13, that loosely fits within the casing 7 and the extension 8, and a flexible connection 14 of any suitable material is attached at one end to the upper end of the hammer-block 13, as indicated by dotted lines in Fig. 2.

For efficient action of the point 10 the diameter of the barrel-shaped portion thereof should be somewhat greater than the exterior diameter of the casing 7 and the attached section 8, which will cause the point to form a bore in the earth of such diameter as will permit the casing to be readily inserted therein.

In the operation of driving the well the point 10 and tubular shield 11 are placed vertically, with the point resting on the ground at a selected place for the well. A suitable derrick-frame (not shown) may be erected where the well is to be sunk and the flexible connection 14 be passed over a pulley or its equivalent on the upper portion of the derrick, and as this is a common device it is not considered essential that it should be shown in the drawings. The point 10 and shield 11 being vertically supported by any suitable means it will be obvious that if the hammer-block 13 is raised by means of the flexible connection 14 and then released to drop upon the cushion-block 12 the point and tubular shield may be driven down into the ground by successive blows of the hammer-block. A continuation of the driving operation will eventually locate the point 10 and shield 11 below the water-bearing stratum, and it should be understood that as the driving operation progresses the casing-sections 8 and 7 should follow the point, the portion 8 seating upon the cushion-block 12.

It will be seen that the hollow shield 11 being of sufficient length to guide the point-body 10 a straight vertical well-bore will be formed in the ground if the driving operation is properly conducted, and the casing 7 will slide down and occupy said bore.

In case there should be slight deviations from a vertical plane of the bore formed in the earth, as described, the descent of the casing-sections 7 8 may be enforced by any preferred means, so that the well-casing will line the bore in the earth and the point 10 and shield 11 will be positioned in or below the water-bearing stratum, as shown in Fig. 1, A indicating the body of the soil above the sand and water strata, and B and C the clay below the water. If the casing 7 and its perforated extension 8 are now elevated a short distance, the perforated section 8 will be located above the tubular shield 11 and in the water stratum B, so that water may be raised in the well-casing by means of a pump, or in some cases the water may be raised in the well-casing by subterrane pressure on the water stratum.

It will be seen that the impact of the hammer-block 13 acts independently upon the top of the point-body 10 and no injurious percussion is applied upon the casing 7, so that the casing is preserved in good condition and, if desired, may be withdrawn at any time from the well-bore, leaving the point 10 and shield 11 in the ground. Furthermore, it will be seen the impact of the hammer-block 13, acting independently upon the top of the point-body 10, facilitates the driving of the well with greater rapidity than would be the case if the well were driven from the top of the casing. Again, where the driving force is exerted upon the independent point the driving of the well will be prosecuted with the same rapidity or despatch its entire length, as the force exerted upon the point does not decrease as the well increases in depth, which would not be the case if the well were driven from the top of the casing. When driving from the top, the friction upon and the vibration within the casing serve to retard the force before it reaches the point, which performs the actual work.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination with a well-casing having a perforated lower end, of a solid point, an imperforate tubular shield secured to and projecting from the point in alinement therewith and in which the lower perforated end of the well-casing loosely fits, the shield being of a length to extend above the perforations of the well-casing, and a hammer-block

movable in the well-casing for driving the point by impact thereon, substantially as described.

2. The combination with a well-casing having a perforated lower end, of a solid point having a socket in its upper end, a cushion-block in the socket, an imperforate tubular shield secured in the socket and projecting from the point in alinement therewith and in which the perforated end of the well-casing loosely fits, said shield being of a length to extend above the perforations of the casing when said casing rests upon the cushion-block, and a hammer-block sliding in the casing to impinge upon the cushion-block, substantially as described.

In testimony whereof we have signed our names to this specification in presence of two subscribing witnesses.

CHARLES F. ALLEN.
WILLIAM B. GROW.

Witnesses:
F. W. GERBERDING,
A. B. SMITH.