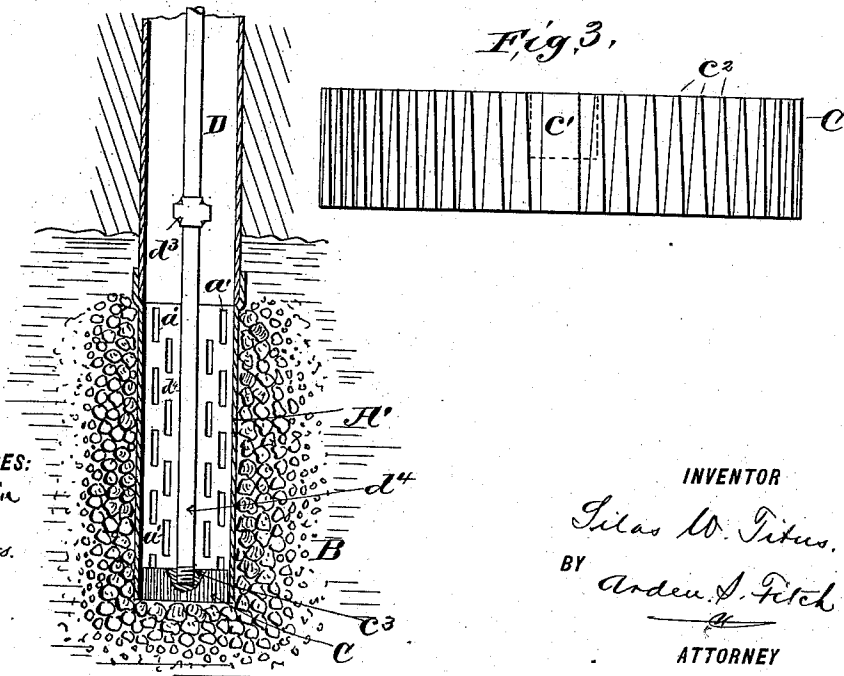
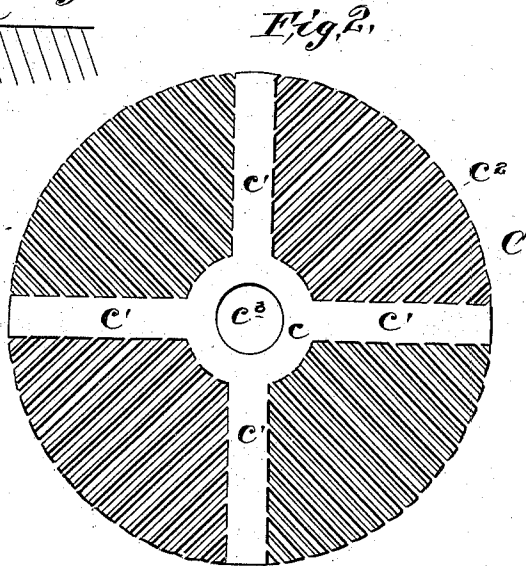
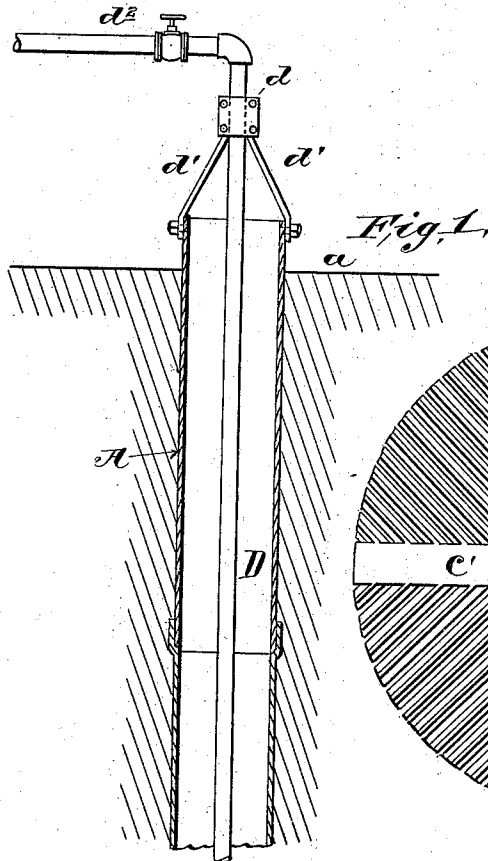


(No Model.)

S. W. TITUS.  
STRAINER FOR WELL TUBES.

No. 546,039.

Patented Sept. 10, 1895.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

SILAS W. TITUS, OF BROOKLYN, NEW YORK.

## STRAINER FOR WELL-TUBES.

SPECIFICATION forming part of Letters Patent No. 546,039, dated September 10, 1895.

Application filed January 25, 1895. Serial No. 536,215. (No model.)

*To all whom it may concern:*

Be it known that I, SILAS W. TITUS, a citizen of the United States, residing at Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Strainers for Well-Tubes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to wells in which the water passes through an eduction-tube or well-casing, the intake end of which is sunk into the water-bearing strata, with its discharge end at the surface of the ground; and my invention consists, primarily, in the combination, with the eduction-tube of a well of the class stated, of a slotted or perforated plate adapted in diameter and outline to fit freely within the eduction-tube and to pass to and lie in the intake end thereof, together with a rigid support adapted in dimensions to pass within and extend longitudinally through and be removably sustained in position in said eduction-tube, and to the lower end of which support said plate is fixedly mounted; and my invention is particularly applicable to wells in which the water is elevated through an eduction-tube or casing from the water-bearing strata, in which the intake end of said tube or casing is sunk to a discharge at the ground-level by means of compressed air injected into the water-column in the said tube or casing; and to this end my invention comprises the combination, with the said eduction-tube or casing and a compressed-air supply-pipe adapted to extend and be adjustable within and to be removable from said tube or casing and provided with an extension beyond its air-outlet adapted to reach to the intake end of said tube or casing, of a slotted or perforated plate adapted in diameter and outline to fit freely within said tube or casing and its intake, and fixedly mounted upon the free end of the aforesaid extension of the compressed-air pipe.

The object of my invention is to provide a strainer at the open end of the intake of a well tube or casing, so that the inflow of water through the end of the intake may be secured without the liability of the entrance into the intake and tube of and consequent

clogging or choking thereof by gravel or other foreign substances, while the said strainer may be adjustable longitudinally of the intake and tube within the same and may also be removable from the well without disturbance of the tube or its intake.

In the drawings, Figure 1 is a central vertical section of a well-tube and apparatus containing my invention. Fig. 2 is a plan of a form of strainer which I preferably employ, and Fig. 3 is an edge elevation of the same.

At A is illustrated a well tube or casing composed of sections in the usual manner, and with its intake sunk in the water-bearing strata, (indicated at B,) while its outlet or discharge is at the ground-level *a*. In sinking these well-tubes it is customary to keep the lower or intake end closed by a plug or cap, and when the intake is seated in the water-bearing strata, which is usually composed of gravel and sand, the plug or cap closing its lower end is ordinarily permitted to remain in its seat, the lower section or sections of tubing constituting the casing being slitted or apertured, preferably as shown at *a'*, so that such sections sunk in the water-bearing strata form the intake, as shown at A', through which the water enters the tube.

When the orifice of the lower end of the tube or casing is closed by a plug or cap, as described, not only is the capacity of the described intake to admit the inflow of water to the tube from the water-bearing strata diminished to the extent of the area of said orifice but the plug or cap is liable to be disturbed in or dislodged from its seat in said orifice by the pressure of the water toward the tube, and particularly in wells wherein the influx of water to the tube is accelerated by the elevation of the water-column within the tube by means of compressed air, as hereinbefore recited; and, as is well known, the dislodgment of the aforesaid plug or cap leaves the orifice at the lower end of the intake open and unprotected, so that the gravel composing the water-bearing strata may be driven into the tube by the water-pressure, clogging and choking the tube and impeding or stopping the flow of the well. The occurrence of these conditions entails great labor

and expense in clearing the well and frequently necessitates the withdrawal and replacing of the entire tube or casing. My invention contemplates the provision of means whereby while the inflow of water to the tube through the orifice at the lower end of its intake is permitted the entrance of gravel or coarse stone into the tube through said orifice is prevented, and whereby the strainer device employed to shield said orifice in the tube is held rigidly in position within the tube independently of the tube itself and is fixedly adjustable in the tube or removable therefrom without disturbance of the tube in any of its parts.

In carrying out my invention I provide a slotted or apertured plate C, which is adapted in diameter and area to fit loosely in the well-tube A and to pass freely through said tube and into and to the orifice or opening in the lower end of the intake A', as shown. This plate constitutes a strainer or screen, which I find it preferable to form as shown plainly in Figs. 2 and 3—namely, with a central hub or body *c* and imperforate radial portions or arms *c'*, the sectors of the plate between said radial arms having each a series in close succession of radially-extending parallel transverse slots, desirably reaching through the rim of the plate, as shown at *c''*, the several parts being homogeneously cast or formed in one piece of metal and the plate being of considerable thickness relatively to its diameter, as illustrated. It will be found desirable to form the aforesaid transverse slots in the sectors *c''* of the plate with their walls inclined toward each other from the upper to the under sides of the plate, so that the slots will each have a flaring channel from inlet to outlet, as shown. This form of the slots provides in the well-known manner for the rapid passage through the screen or strainer of any particles of gravel or sand which may gain entrance to the inlet ends of the slots, so that the clogging of the screen or strainer is prevented.

In further carrying out my invention I provide a rigid support, which is adapted to extend longitudinally within the tube A and to be removably sustained in position therein, and this support may be constituted by a rod or tube D, held suspended in the tube or casing A by means of a clamp *d*, sustained by legs *d'*, mounted on the upper end of the tube or casing, so that the rod or tube may be adjusted longitudinally relatively to the tube A, or may be wholly withdrawn from the tube without disturbing the same. Any other known and equivalent means may be employed to adjustably and removably sustain the rod or tube D, as described; and in the case of a well wherein compressed air is employed to elevate the water-column in the well tube or casing the aforesaid support D may also constitute the compressed-air supply-

pipe, as by a valved pipe *d''*, at its upper end with a compressed-air reservoir or other source of supply, and being provided with an air-outlet *d'''* within the well-tube A and having an extension *d''''* below said air-outlet reaching to the intake end of the well-tube A, as shown.

Upon the lower end of the rod or tube D at the intake end or orifice of the well-tube I fixedly mount or attach the hereinbefore-described screen or strainer-plate C; and for this purpose the plate may be provided at the upper side of its central hub or body *c* with a threaded recess or socket *c''*, adapted to receive a threaded end of the rod D, or the extension *d''''*. The strainer-plate will thus be supported rigidly within the intake end of the well-tube against the inflow of water through it and independently of the well-tube or casing; and by means of said rod or tube D the said strainer may be adjusted longitudinally of the well-tube at the intake thereof, which is at times desirable in order to permit the water-pressure to effect a disturbance of the gravel about the intake, so as to create new water-channels in the strata and thus promote the inflow of water to the tube; or said strainer may be wholly removed from the tube and drawn to the surface, which may be necessary sometimes in order to clear it of sand or gravel, and may then be replaced in the intake without disturbing the well-tube or casing.

It is evident that in a well in which compressed air is employed to elevate the water-column in the well-tube, and in which it is desirable, or necessary, at times to adjust the air-outlet at some particular point in the water-column, the longitudinal movement of the air-pipe, the extension of which supports the strainer, as herein described, may be accomplished to effect the said adjustment without affecting the performance of the function, as set forth, of said strainer in the intake of the well-tube.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a driven-well apparatus, the combination with the well-tube or casing having an open-end intake adapted to be sunk in the water-bearing strata, of a slotted or perforated plate adapted in diameter and area to fit freely within and pass through said tube or casing and into and lie within the open end of said intake thereof, together with a rigid support, adapted in length to extend longitudinally throughout said tube and intake, and having said plate fixedly attached to its end within said intake, and removably sustained in position in said tube or casing, substantially as and for the purpose set forth.

2. In a driven-well apparatus, the combination with the well-tube or casing having an open-end intake adapted to be sunk in the water-bearing strata, of a slotted or perforated plate adapted in diameter and area to

fit freely within and pass through said tube  
or casing and into and lie within the open end  
of said intake thereof, of a pipe adapted in  
length to extend longitudinally within said  
5 tube or casing and adjustably and removably  
sustained in position therein, and an extension  
below said outlet adapted to reach into  
the open end of said intake, with said plate

fixedly attached to the end of said extension  
within said intake, substantially as and for the  
purpose set forth.

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