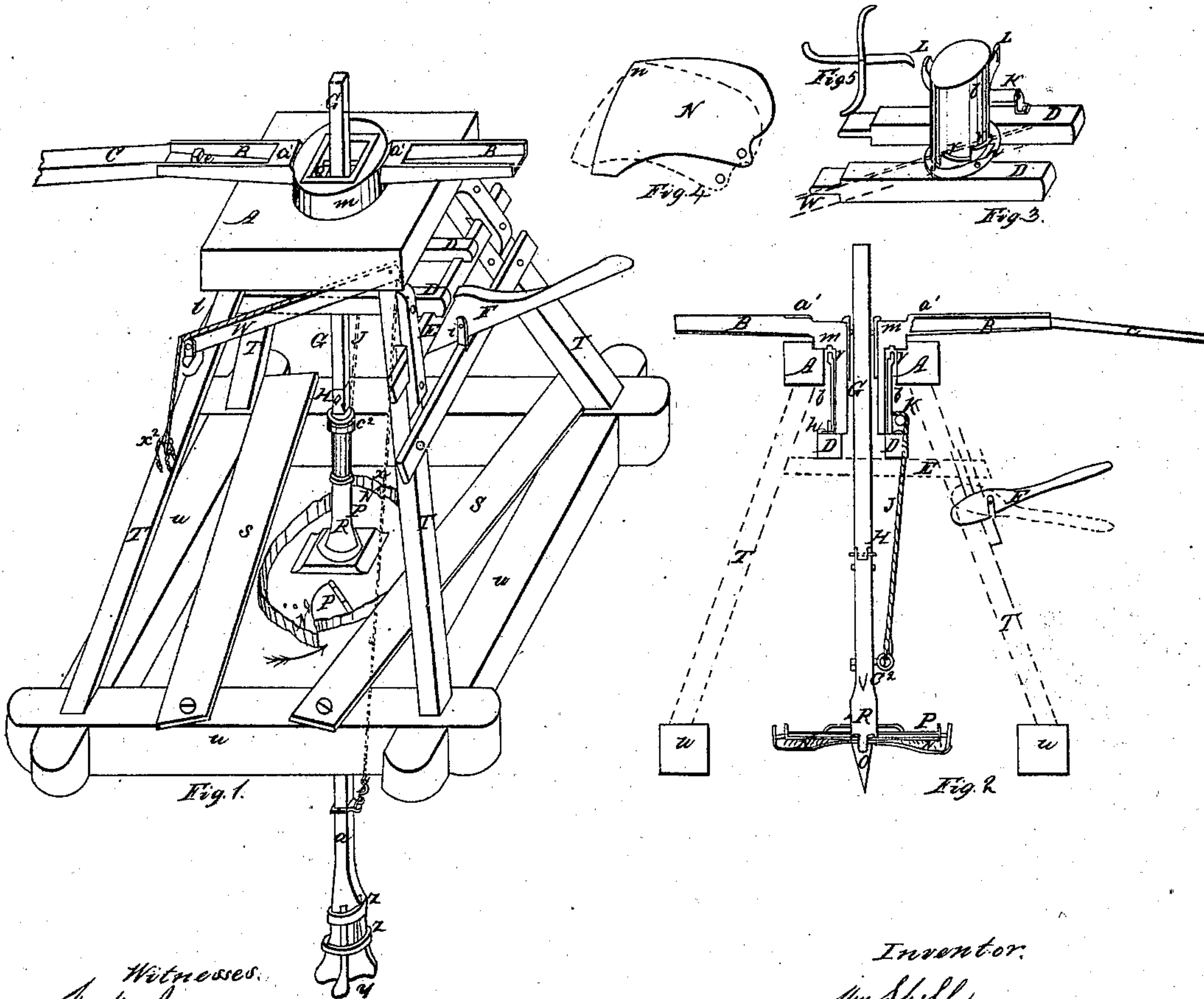


W. Skiff,

Boring Artesian Wells.

N^o 80,773.

Patented Aug. 4, 1868.



Witnesses.
H. H. Jackson
V. Manville

Inventor.
W. Skiff

United States Patent Office.

WILLIAM SKIFF, OF CAMANCHE, IOWA.

Letters Patent No. 80,773, dated August 4, 1868.

IMPROVED WELL-BORING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM SKIFF, of the town of Camanche, in the county of Clinton, State of Iowa, have invented a new and useful Apparatus for Boring and Drilling Wells; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in so constructing and arranging a machine, that the digging a well may be done by means of an auger arranged with adjustable extensible lips, operated by means of an extensible shaft, whereby earth may be taken from under a curbing or stone wall, and removed from the well. It further consists in having attached to same machine a drilling-device, by which, when rock is found in digging a well, the auger is removed, and a drill attached and operated by the same power as the auger, thereby making a convenient and useful apparatus.

To enable others to fully understand my invention, and to construct and use the same, I will describe its construction and operation.

In the drawings, the same letters refer to the same parts of the machine in the different drawings.

Figure 1 represents a perspective view of the device.

Figure 2 represents a vertical section.

Figure 3 represents a perspective view of the drum that operates the drill and hoists the auger.

Figure 4 represents the movable lip; a top view.

I construct an auger of cast or sheet metal, with sockets to receive the extension-lips, which are forced out by turning the shaft R, which turns on a centre; and the two points, as shown at R, fig. 2, fit into holes in the lip, and by turning the shaft the lip is changed from the position as shown at N, fig. 4, to that of the dotted line in same figure, the point at n, fig. 4, remaining stationary in the line of the circumference of the auger. I construct a cone-shaped nut, as at o, fig. 2, which confines the shaft R, and also serves as the centre of the auger. To the shaft R, I attach extension-rods or shafts of wood, fastening them by means of a square socket and a pin, as at H, figs. 1 and 2.

I make the shaft G any desired length by multiplying these sections, joining them by means of square sockets, as at H.

To operate this auger, I construct a drum, m, with a square aperture through it for shaft G to pass through. To relieve the friction in the up-and-down movement of the auger, I put in small friction-rollers in this aperture, as at Q, fig. 1. To this drum m, I have sockets for beams to attach horses to, as at B B, figs. 1 and 2. These sockets have this arrangement for ease of taking the apparatus apart. There is a cap-piece, as at a' a', and a stop, as at e, fig. 1, and by having the beam e fitted to this socket, it will be held in its proper position without any bolts to fasten it, thus saving much time.

To admit any small stone into the auger, I construct a valve, hinged as at P, fig. 1, which, as the auger turns in the direction of the arrow, if it strikes a stone, the valve P will be forced up, and the stone come on the auger.

To hoist the auger out, I have a collar made fast to the shaft R, below the joint at H; then a loose ring with an eye and link, as at C². To this link I attach a rope, and pass it up over the friction-roller K, then around the drum b as around a capstan, holding firmly on to the rope, and by means of the lever F raise the supports of the drum b, so that the points L L will mesh into the mortise or apertures m m. Now, by turning the drum m, fig. 1, it, by means of the points L L, gives motion to the drum b, which winds up the rope over the friction-roller K, thus raising the auger with its load to the surface; and by bringing together the rests S S under the auger, it may rest on them, and be emptied in any convenient way. It will here be seen that by means of the adjustable lips N N, the auger, after being filled and the lips brought back to the line of the circle of the auger, it will be less than the diameter of the excavation, and consequently, easily raised; and when I desire to lower the auger into the well, I raise the lever F. This allows the supports E and D D to

drop down, carrying with them the drum *b*, which is confined to D D by means of the collar *h*, fig. 2. This unmeshes the drum *b* from *m*, and immediately the auger descends into the well. I regulate its descent by taking a turn with the rope J around some point to govern its speed. By having different-sized augers, any required-size well may be excavated.

When I have reached rock, and it is needful to drill for greater depth, I change my device a little, and operate a drill as follows:

I remove the auger, and in its place put the drill, as shown at Y, fig. 1. I use the same extension-shaft G and socket-joints H. To operate the drill, I have a collar firmly fastened to the shaft of drill, as at *a*, fig. 1. To this collar I have a link to fasten the rope *x* to. This rope I pass over a pulley or sheave in the end of the lever *w*, fig. 1, then over the end of lever *w* to a pin for fastening it at *x*², indicated by red lines, fig. 1. This lever *w* has a projection of metal on the inner side that rests on the cam or inclined pieces on drum *b*, marked *v v'*, and by means of the lever F putting the drum *b* in gear with drum *m*, the lever *w* is moved up and down, in consequence of the inclines *v v'* thus communicating an up-and-down motion to the rope *x*, and it to the drill Y. To hoist the drill out, I use the same method as described to raise the auger.

For convenience in moving, I construct the frame in parts, putting the same together so as to be easily taken down.

For the convenience of sharpening the drill and changing the size to make different-sized holes, I make the drill in parts, having four bits which fit into the shaft *a* with a dove-tail, and are firmly held in place by means of rings, *z z*. So, if I wish to sharpen the bits or change the size, I loosen the rings *z z*, and put in other bits of the desired size. I further make these bits with a curve, as shown in fig. 5, to prevent becoming fast in any fissure in the rock. Also, the drill being with four cutting-points, it has to be turned only one-fourth around to complete the circle.

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

1. The arrangement of the drums *m* and *b* with the arms B B, points L L, and inclines *v v'*, for purposes set forth.
2. The arrangement of the auger with the adjustable lips N N, with shaft R, all constructed as herein set forth.
3. The combination and arrangement of the drill Y, rope *x*, lever *w*, lever F, and inclines on drum *b*, for the purposes herein described.

WM. SKIFF.

Witnesses:

WM. W. SANBORN,
V. MANVILLE.