C. G. SINGER.

Tool for Securing Bushes in Holes.

No. 220,996. Patented Oct. 28, 1879.

Fig. 1.

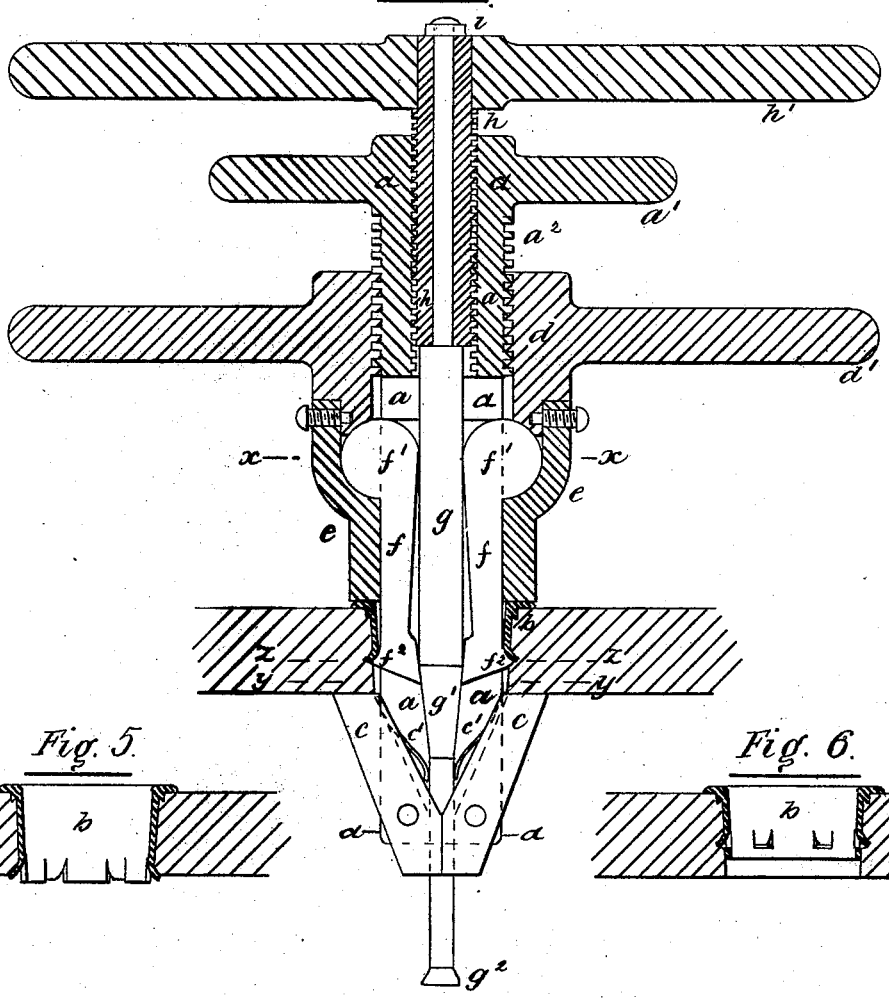


Fig. 5.

Fig. 6.

Fig. 2.

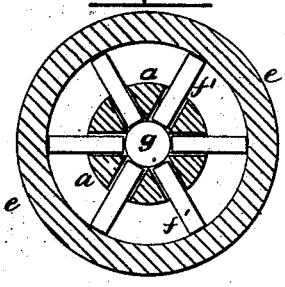


Fig. 3.

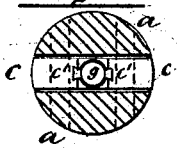
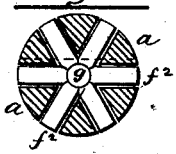


Fig. 4.



Witnesses.

H. D. Williams

William Sheelork.

Charles G. Singer

Inventor.

per

Alfred Sheelork.

Atty.

UNITED STATES PATENT OFFICE.

CHARLES G. SINGER, OF NEW YORK, N. Y.

IMPROVEMENT IN TOOLS FOR SECURING BUSHES IN HOLES.

Specification forming part of Letters Patent No. **220,996**, dated October 28, 1879; application filed August 6, 1879.

To all whom it may concern:

Be it known that I, CHARLES G. SINGER, of New York, county and State of New York, have invented a certain new and useful Tool for Securing Bushes in Holes, of which the following is a specification.

The object of this invention is to furnish a tool for forcing bushes into holes and securing them therein by cutting spurs from the edge of the bush, and at the same time driving them outward into the sides of the holes.

It consists of a cylindrical body of a size to just pass through the bush with two levers pivoted in a slot cut through the lower end of it, which are constructed to be closed up in the slot, so that all parts of them are within the outside surface of the body, by means of a taper-head on the end of a rod passing through the entire length of the body and through a short screw fitting into a tapped hole in the upper end of the body. The rod is secured to the screw, so as to be moved with it longitudinally when it is turned around by a handle fastened to its end. The levers are thrown outward by springs, their upper ends bearing against the under side of the stave when the bush is forced down into the hole by means of a sleeve fitted on the outside of the body and moved up and down thereon by a screw formed in the upper part of it fitting on a corresponding screw-thread formed on the body.

Flat jaws with circular heads fit in longitudinal grooves cut through the body. Their circular heads project beyond the body, and are held in a circular groove formed in the sleeve. The lower ends of the jaws, which are the cutting-edges, are below the bottom of the sleeve a distance equal to the depth of the bush.

After the bush has been forced home in and held in the holes by the bottom of the sleeve bearing on the flange, the lower ends of the jaws are forced outward by means of a taper provided therefor on the central rod, thus cutting indentations in the edge of the bush equal to the thickness of the jaws, and at the same time forcing outward the cut sections as spurs into the wood, thereby securely fastening the bush in the hole.

But to describe my invention more particularly, I will refer to the drawings accompanying this specification and forming a part thereof, in which—

Figure 1 represents a longitudinal section of my improved tool for securing bushes in holes, showing the manner in which it operates. Fig. 2 is a transverse section cut through the line $x\,x$. Fig. 3 is a transverse section cut through the line $y\,y$, and Fig. 4 is a transverse section cut through the line $z\,z$.

The body a is a cylindrical piece of metal of a diameter a little less than the inside of the bush b. It is provided with a handle, a'. On its upper end, and just below the handle, and for about one-third of its length on the outside, is cut the screw-thread a^2. Commencing at the lower end of this thread are six equidistant radial slots, which meet in the center of the body and extend nearly to the lower end of it, and two of these slots, diametrically opposite each other, are carried out to the extreme end, in which are pivoted the two resisting-levers $c\,c$, shaped as shown at Fig. 1, so that their upper ends are thrown outward by means of the springs $c'\,c'$, secured to their inner edges, when the lower end of the tool is passed through the bush placed in the hole made therefor through the wood, and they bear against the under side of the wood, thus holding the tool in position while the bush is being forced home into the hole, which is done by turning the nut d of the sleeve e, it being provided with the handle d' for this purpose. The nut d fits on the screw-thread a^2 of the body a, and is swiveled in the sleeve e, as shown, so that as the nut d is turned the sleeve e does not turn with it, but is only moved up and down on the body a, and in being moved downward it forces the bush home in the hole.

The body a is held from moving by means of the handle a' on its upper end when the nut d is turned thereon to force the bush b in the hole, or when the nut is loosened.

The tool is now held firmly in the bush to allow the parts of the lower edge of it to be pressed into the side of the hole, which is done by the jaws $f\,f$, which are placed in the radial slots in the body a. These cutting-jaws $f\,f$ are made of flat pieces of steel, with the circular heads $f'\,f'$, one-half of which project beyond the body a and fit into a semicircular groove formed in the sleeve e and nut d at

their juncture, so that the jaws $f\,f$ are caused to move longitudinally in their radial slots as the sleeve e is moved up and down the body. The lower ends of the jaws $f\,f$ extend below the under side of the sleeve e a distance equal to the depth of the bush, and at the lower part of their outside edges are formed the projections f^2, which cut and bend outward the spurs from the edge of the bush, as shown in Fig. 1, when the jaws themselves are forced outward, which is accomplished by means of the taper part g' of the central rod, g, bearing against the taper edges formed on the inside of the jaws. The jaws turn on their circular heads f' in the semicircular groove in the sleeve e, the inside of these heads being against the large portion of the central rod, g. This central rod, g, is moved longitudinally in the body a by means of the hollow screw h, which fits in the tapped upper portion of the central hole in the body a, the upper end of the rod being turned down so as to pass through the hole in the hollow screw h, and forming a shoulder for the bottom of the screw h to bear against; and on the part of the rod projecting above the top of the screw is secured, by riveting or otherwise, the collar i, so that there is no longitudinal play between the screw h and rod g, yet leaving the screw free to turn without turning the rod.

The handle h' is for the purpose of turning the screw h, and is fitted on a square provided therefor on the top of it.

Below the taper g' the rod g retains the size of the small end of the taper until it passes out through the lower ends of the levers $c\,c$, and its extreme end is provided with a reverse conical head, g^2. The inside edges of the levers $c\,c$ are hollowed to allow the rod g to pass between them, as when they are thrown outward, as shown in Fig. 1, the parts of their inside edges below the pins on which they turn meet together.

After the bush has been forced home into the hole, as described, and securely fastened therein by the parts of its edge being thrown outward as spurs into the side of the hole by means of the jaws f^2, which are forced beyond the body a, by turning the handle h' of the screw h, and so driving the taper of the rod g between the inside taper edges of the jaws, the tool is removed by first turning the handle h' backward, and so raising up the rod g until the reverse conical head g^2 comes in contact with the lower ends of the levers $c\,c$. This frees the cutting-jaws and allows them to pass within the periphery of the body a, as shown in the cross-section, Fig. 4, as the nut d is turned so as to raise the sleeve e off the top of the bush. The handle h' is then still further turned, and causes the head g^2 of the rod g to pass between the lower ends of the levers $c\,c$, which are tapered off for this purpose, thereby forcing their lower ends apart and closing their upper ends within the body a, as shown in the cross-section, Fig. 3, thus allowing the tool to be withdrawn from the bush.

In the drawings six jaws are shown; but their number may be as required, providing the amount of metal left in the cross-section of the body after the slots are made therein is sufficient to give the tool the necessary strength; and the central rod, g, with its taper g', instead of being circular, as shown, may be made polygonal, corresponding to the number of jaws, thus presenting more friction-surface between the parts of the rod and jaws in contact, which parts, as well as the cutting projections of the jaws, I propose to harden and temper.

It is obvious that the tool may be used to secure bushes in holes when the bush is made deep enough to project somewhat below the bottom of the hole by allowing the upper ends of the levers $c\,c$ to spread a little wider apart, the jaws in such case forcing and clinching the sections cut from the edge of the bush around the lower edge of the hole instead of forcing them into the side of the hole.

Fig. 5 shows a bush so secured in a hole; or the position of the cutting projections of the jaws may be so arranged as to cut and force outward spurs from the body of the bush, leaving the lower edge intact, as shown in Fig. 6.

After one operation of the tool in forcing out one set of sections as spurs from the body or lower edge of the bush, it may be loosened up and turned partly round in the bush, and a second set of sections cut and forced outward as spurs, if thought necessary. In fact, the whole of the lower edge of the bush may be so forced outward, if desired.

I wish it understood that I do not confine myself to operating the sleeve for forcing bush into the hole by means of a nut turning on the body of the tool, as a cam or lever may be used for this purpose, nor to operating the central rod for forcing out the jaws by means of a screw, as a lever or cam may be used for this purpose, and in very large bushes it may be advantageous to operate it by hydraulic power.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a tool for forcing bushes into holes, in combination, a lever or levers pivoted to the lower end of a rod, constructed and operated to pass through the bush, and then open out, so as to bear against the under side of the hole, with a sleeve operated by a nut turning on the outside of the rod, substantially as hereinbefore set forth.

2. In a tool for securing bushes in holes, a series of jaws arranged in radial slots in the body, in combination with a taper-rod passing through the center of the body, and operated substantially in the manner described, so as to force the jaws outward against the bush, and thereby cut and force outward spurs from the body or edge of the bush, as hereinbefore set forth.

3. In a tool for forcing bushes in holes and

securing them therein, in combination, the body *a*, levers *c c*, jaws *f f*, taper-rod *g*, and sleeve *e*, operated by suitable means, and constructed substantially as hereinbefore set forth.

4. The body *a*, provided with the spring-hinged levers *c c*, in combination with the sleeve *e* and swiveled nut *d*, substantially as and for the purpose hereinbefore set forth.

5. The jaws *f f*, constructed and held in the slots in the body *a* by the sleeve and nut *e d*, in the manner described, in combination with the taper-rod *g* and hollow screw *h*, operated by suitable means, substantially as and for the purpose hereinbefore set forth.

6. The levers *c c*, pivoted in a slot in the lower end of the body *a*, and provided with the springs *c' c'*, in combination with the head g^2 on the rod *g*, operated by suitable means, and thereby closing the levers *c c* within the body *a*, substantially as and for the purpose hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 4th day of August, 1879.

CHAS. G. SINGER.

Witnesses:
H. D. WILLIAMS,
ALFRED SHEDLOCK.