(No Model.)

# C. D. ROGERS.

## WOOD SCREW.

No. 434,809. Patented Aug. 19, 1890.

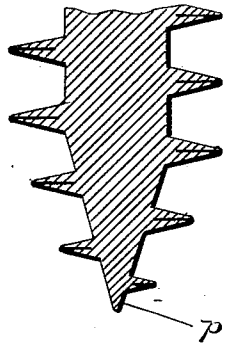



FIG. 1.

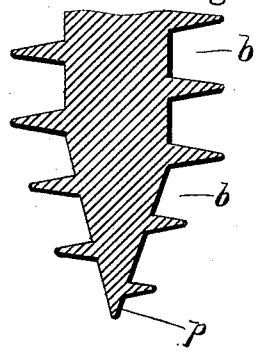



FIG. 2.

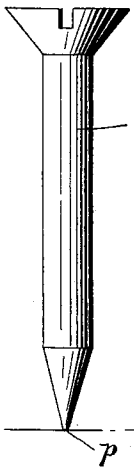



FIG. 3.

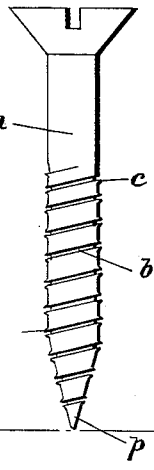



FIG. 4.




FIG. 5.

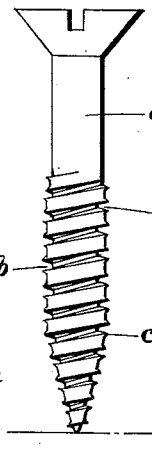



FIG. 6.




FIG. 7.

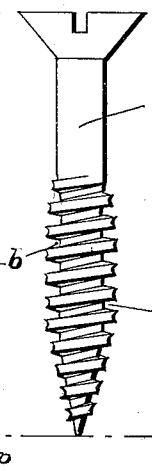



FIG. 8.

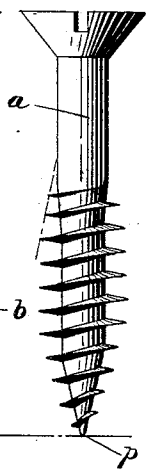



FIG. 9.

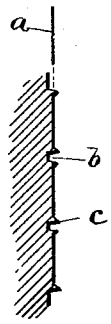



FIG. 10.

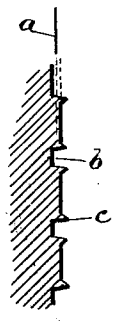



FIG. 11.

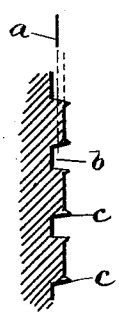



FIG. 12.

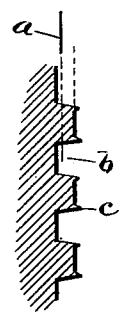



FIG. 13.

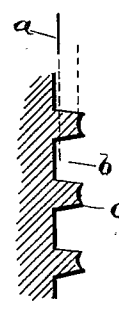



FIG. 14.

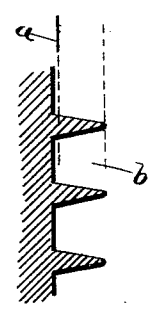



FIG. 15.

WITNESSES.

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INVENTOR.

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Attys.

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# UNITED STATES PATENT OFFICE.

CHARLES D. ROGERS, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE AMERICAN SCREW COMPANY, OF SAME PLACE.

## WOOD-SCREW.

SPECIFICATION forming part of Letters Patent No. 434,809, dated August 19, 1890.

Application filed May 11, 1887. Serial No. 237,823. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES D. ROGERS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Wood-Screws; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in wood-screws having the thread raised from the body of the blank by compression, and by rolling between dies provided with oblique grooves, into which the metal is forced by the ribs between the grooves. Screws of this character are described in a patent of the United States granted to H. A. Harvey June 30, 1885, and numbered 321,214. The spiral groove between the threads described in that patent is formed by dies, which are gradually forced axially into the metal from the commencement of the operation to the end, so that the groove is gradually deepened and widened, and the metal is forced outward from under the ribs of the dies, thereby forming two ridges, which gradually spread apart and increase in size as the rolling progresses until the two ridges between two adjacent parts of the groove of the screw are brought together and to an edge in the groove of the forming-die. The thread thus formed is not a solid mass of metal, but has a seam running through it where the two ridges are brought together. The improved screw which I produce has a solid thread, which is the result of a different mode of operation in raising the thread. This solid thread possesses the following advantages over the seamed thread described in the patent referred to: It is stronger and can be raised higher, so as to take a firmer hold of the wood, into which the screw is inserted. The thread can also be made thinner and therefore be more easily inserted in the wood. Practically a larger screw can be made from the same blank than can be made when the thread is raised in the way described in the patent referred to.

Figure 1 of the drawings hereto annexed shows a section, enlarged, of a portion of a screw having the thread described in the patent referred to, exhibiting the seam running through the thread. Fig. 2 shows a similar section of my improved screw. The succeeding figures from 3 to 9, inclusive, show elevations of a blank, from which a screw is formed, and of the partly-formed screw at several stages of the operation of raising the thread, the last, Fig. 9, representing a finished screw. Below these last figures are enlarged sections of a part of a screw at the corresponding stages, numbered from 10 to 15, inclusive.

In the several figures, *a* indicates the body of the blank and the unthreaded part of the screw, and *p* the pointed part of the blank and the screw. The groove, the bottom of which forms the body of the threaded portion of the screw, and the raised part of the metal, which finally forms the finished thread, are indicated by *b*. A slight burr, which is formed on the raised portion of the metal as the rolling progresses and which disappears when the screw is finished, or in a subsequent operation of cleaning, is indicated by *c*. It will be observed by reference to Figs. 10 to 15 that the groove reaches its maximum depth near the commencement of the operation, and that its width is gradually increased until the thread is fully formed. The increasing width is also shown in Figs. 4 to 9. It is also apparent from these figures that the width of the raised portion of the metal is gradually reduced and its height increased until the thread is finally finished. This result is secured by the gradual and continued lateral compression of the metal, which forms the thread of the screw between the ribs of the grooved dies as the blank is rolled, and which are narrow at the ends where they commence to act upon the blank, so that they may be immediately forced into the metal to the depth required for the body of the threaded part of the screw and which gradually increase in width to the opposite end of the die. Thus the ribs act as wedges to compress the metal between them and compel it to expand radi-

ally from the blank and into the grooves of the dies. At the end of the dies where the rolling commences the grooves in the die will be both wider and deeper than the thread to be produced, and the raised metal will not fill the grooves; but they grow narrower and shallower as the opposite end is approached until they become near the end the exact counterpart of the thread to be produced.

The above-named Harvey has described in a patent granted to him January 3, 1882, and numbered 251,874, a circular rotating die, which acts in connection with a concave stationary die to raise the thread described by him; but I prefer to make my dies straight and to give to one of them a reciprocating motion past the other, which is stationary.

In an application of even date herewith I have described more particularly than herein the dies required for making the screws herein claimed, and in another application, also of this date, I have described an improved machine for operating such dies.

I claim—

A screw having a solid thread raised from the body of the blank by rolling it between dies, which compress laterally the metal to form the thread, and force it to expand radially from the blank into grooves in the die having a form transversely the counterpart of that to be given to the thread.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES D. ROGERS.

Witnesses:
CHARLES HANNIGAN,
GEO. H. REMINGTON.