(No Model.) 2 Sheets—Sheet 1.

C. D. ROGERS.

ROLLED WOOD SCREW.

No. 438,754. Patented Oct. 21, 1890.

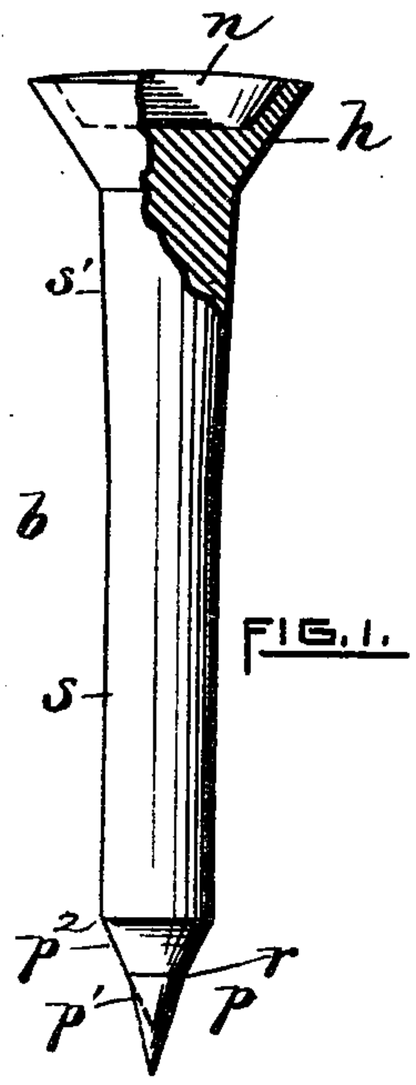

FIG. 1.

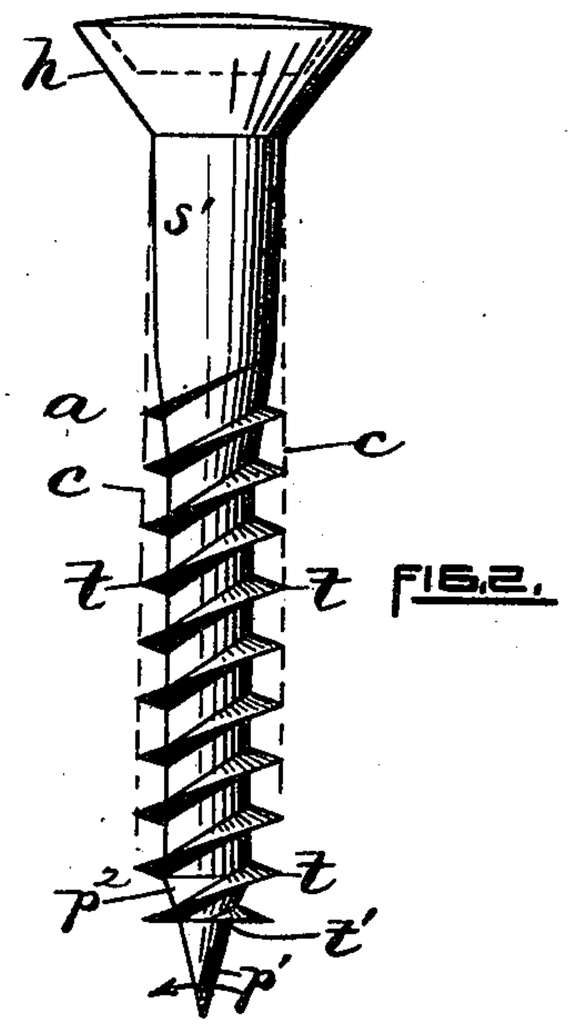

FIG. 2.

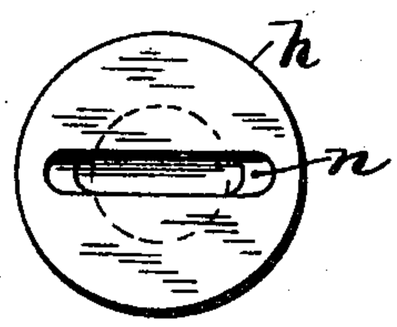

FIG. 4.

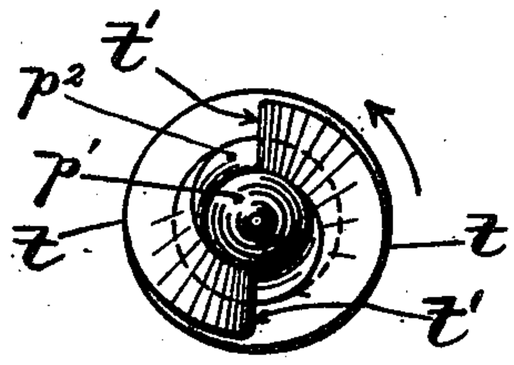

FIG. 3.

WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

C. D. ROGERS.

ROLLED WOOD SCREW.

No. 438,754. Patented Oct. 21, 1890.

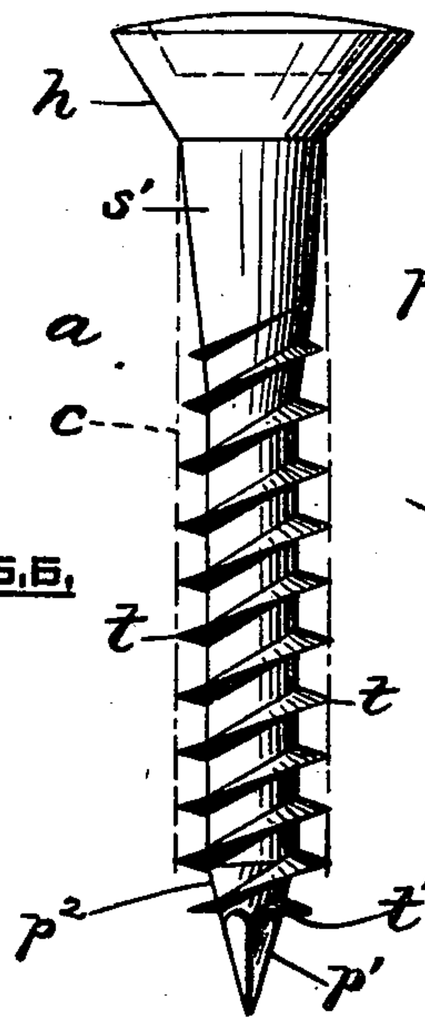

FIG. 6.

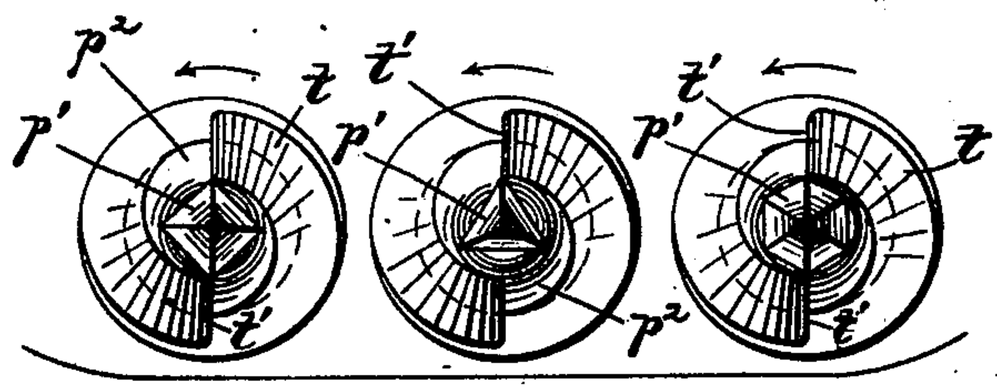

FIG. 7.

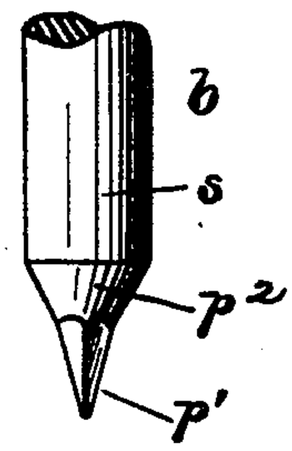

FIG. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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

ROLLED WOOD-SCREW.

SPECIFICATION forming part of Letters Patent No. 438,754, dated October 21, 1890.

Application filed August 4, 1890. Serial No. 360,863. (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.

In the manufacture of wood-screws it is now, as well as for some years past, the almost universal practice to provide such screws with what is termed a "gimlet-point"—that is, screws adapted to be inserted into wood without the necessity of first boring a hole into the wood for the screw. This type of screw is not confined alone to cut screws—that is, screws in which a spiral groove is cut into the blank's body to produce a thread by the aid of a cutting-tool—but it also includes the more modern, or "rolled" screw, as it is termed. The latter are in some instances produced by introducing the blanks cold between a pair of oppositely-traveling dies having their working-faces provided with a series of inclined grooves and ribs. The action of these grooves and ribs is to roll a spiral groove or crease into the blank's shank portion, the displaced metal being at the same time gradually transformed into a raised rib or thread having a suitable form cross-sectionally. Sometimes the threads of a rolled screw are produced without an appreciable elongation of the blank, the thread then being considerably larger in diameter than the normal size of the blank. Again, the screw is elongated and not enlarged laterally by the rolling process, the diameter of the threaded and unthreaded portions being alike, and sometimes the screws are both enlarged and elongated by the action of the dies to which they are subjected. I believe that in each of the methods of rolling just referred to the point portion of screws thus produced are to a great extent imperfectly screw-threaded.

I have discovered that it is not necessary that a rolled screw shall have a screw-threaded point in order to readily enter it into wood, one reason being that the metal now used is more homogeneous or less fibrous than that formerly employed. Therefore the thread can be made thinner and consequently sharper, so that it is more easily inserted, because the edge of the thread readily cuts the wood as the screw is advanced into it. This latter feature is especially noticeable when the threads are produced by my improved dies, which form a solid thread, as clearly described in a United States Patent granted to me September 20, 1887, and numbered 370,354.

The improved wood-screw forming the subject of my present application differs from others of its class in that it has an unthreaded sharpened or cone-shaped centering end or tip formed on its point portion adapted to be inserted into wood by a slight blow. The point portion is also provided with oppositely-arranged screw-threads, commencing at the base of the tip, which extend radially and form chisel-shaped or cutting edges. From this point the two threads extend rearwardly along the blank's body any desired distance, the screw terminating at the adjacent end in an enlarged head, provided with a slot or other suitable form by which the screw is adapted to be inserted in the wood. The unthreaded portion of the body of the screw uniting the head and threaded portion I prefer to make slightly tapering or conical, thereby increasing its strength.

An advantage of my improvement is that in inserting the screw the unthreaded tip serves to first center and steady or support the screw laterally, after which the sharpened or chisel-pointed end of the two threads act to cut their way readily into the wood. By the employment of the double thread the work or resistance opposed to the entrance of the screw is equalized at all points, so that it is more easily and truly introduced than screws having a single thread and unprovided with the sharpened tip and chisel-shaped thread terminations.

In the appended two sheets of drawings, Figure 1 represents a side elevation of the headed screw-blank before being screw-threaded and as made from wire, a portion of

its upper portion being broken away. Fig. 2 is a similar view of the blank after being screw-threaded and forming my improved rolled wood-screw. Fig. 3 is an inverted end view, enlarged, of the screw. Fig. 4 is a plan view. Fig. 5, Sheet 2, is a side view of the lower portion of a blank having its spur or entering end polygonal or pyramidal shaped. Fig. 6 is a similar view of the blank shown in Fig. 5 after being screw-threaded; and Fig. 7 is an invented end view, enlarged, showing modified forms of the pyramidal point.

In the drawings, *b* indicates the blank as a whole, consisting of the headed portion *h*, an enlarged or tapering shank portion *s'*, the cylindrical shank portion *s*, and the point portion *p*, the latter provided with a comparatively blunt part p^2, extending from the plain portion *s* and terminating in a sharpened tip *p'*, having the inclination of its sides more acute than those of the proximate portion p^2.

The blanks are made singly from a continuous length of wire whose normal diameter is substantially the same as that of the cylindrical part *s*, the head *h* and enlarged portion *s'* being formed simultaneously by upsetting the metal in a suitable die by means of a heading-machine. The nick *n* may also be produced at the same time. The headed wire is next forced out of the die and fed ahead the desired distance to produce a blank, after which properly-shaped cutting-off dies conjointly sever the blank from the wire and form the point portion *p*. The blanks *b* are next introduced to a machine which forms the double screw-threads *t* upon the body of the blank by rolling it between dies, which force the metal to expand radially into grooves in the die, which give the form required for the threads, the completed screw being indicated by *a*, Fig. 2. It will be noticed that the diameter of the threaded portion *t* is substantially the same as the diameter of the enlarged plain portion *s'* of the shank at its junction with the head *h*, as indicated by the parallel dotted lines *c*. The screw-threads terminate practically about midway of the point portion *p*, or at the intersection of the parts p^2 and *p'*, in oppositely-arranged sharpened edges *t'*. (See Figs. 2 and 3.) These sharpened or chisel-shaped edges are first to enter the wood (after the introduction of the spur *p'*) and readily cut their way through it as the screw is advanced (see arrow direction) by the aid of the driver. The full efficiency or holding capacity of the screw *a* is thus obtained, it being well known that a screw threaded to the extreme end of a cone-shaped point adds nothing to its holding powers.

It is obvious that the sharpened or spur-shaped tip *p'* may have a pyramidal form, substantially as represented by Figs. 5, 6, and 7, in lieu of the conical form shown by the other figures, without departing from the spirit of the invention. In such case the blanks, Fig. 5, are cut off by means of dies having a correspondingly-shaped cavity.

I would further state that if the point be extended, as indicated by dotted lines in Fig. 1, then the point *p* would be too blunt to serve one of the purposes required, or, in other words, the resistance to entering the wood would be too great, whereas the spur-point portion *p'* serves to overcome the objections by having a more acute angle. Another advantage of the double angle formed on the point portion of the blank (see Fig. 1) is that the part p^2, having a less acute angle, is essential, in order to provide the amount of metal necessary to be transformed into the enlarged threads on the point as compared with an ordinary rolled wood-screw having a screw-threaded point—that is to say, if the sides of the point formed a true cone then the metal taken to produce the thread would leave the contiguous sides more acute than the entering end, which is undesirable. Practically by first making the sides of the point *p* of the blank substantially as represented in Fig. 1, the root of the thread when formed thereon will then be substantially a continuation of the sides forming the entering portion *p'*. (See Fig. 2.) By means of such construction it will be observed that a re-entrant angle *r* is formed in the blank at the intersection of the two parts p^2 *p'*, forming the point portion, which angle practically disappears when the thread is produced. (See Fig. 2.)

I claim—

1. A screw with the thread of the cylindrical portion extended onto the conical surface of the point, but reduced in diameter to correspond with the diameter of such surface and terminating in a cutting-edge before the extreme point is reached.

2. A wood-screw having the threads of the cylindrical portion extended onto the surface of the point portion, but reduced in diameter to correspond with the diameter of such surface, and terminating in a cutting-edge, and having an unthreaded spur shaped entering portion *p'*, substantially as hereinbefore described.

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

CHARLES D. ROGERS.

Witnesses:
CHARLES HANNIGAN,
GEO. H. REMINGTON.