(No Model.)

H. K. JONES.

WOOD SCREW.

No. 470,804. Patented Mar. 15, 1892.

Fig. 1.

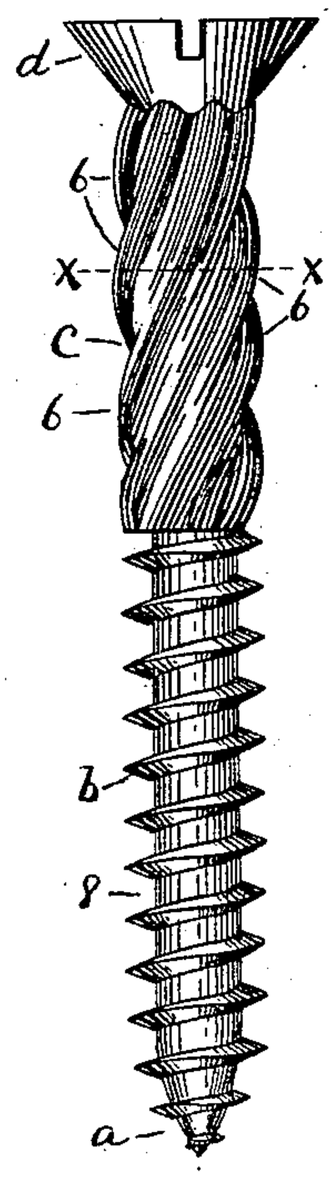


Fig. 2.

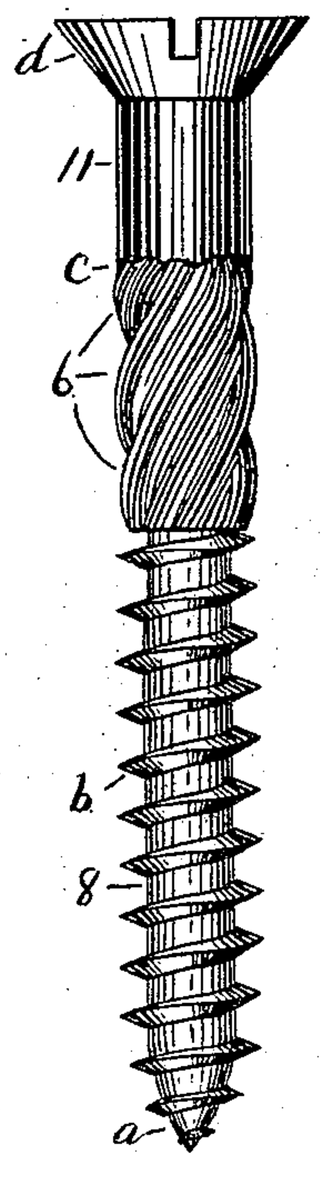


Fig. 3.

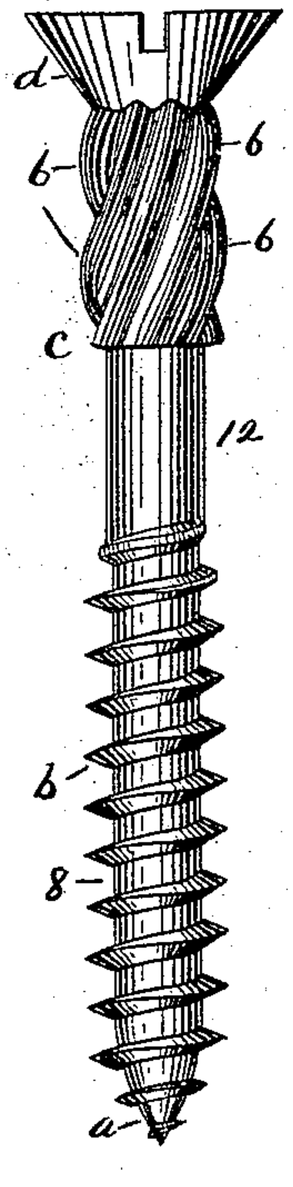


Fig. 4.

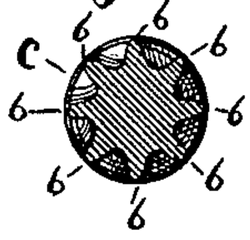
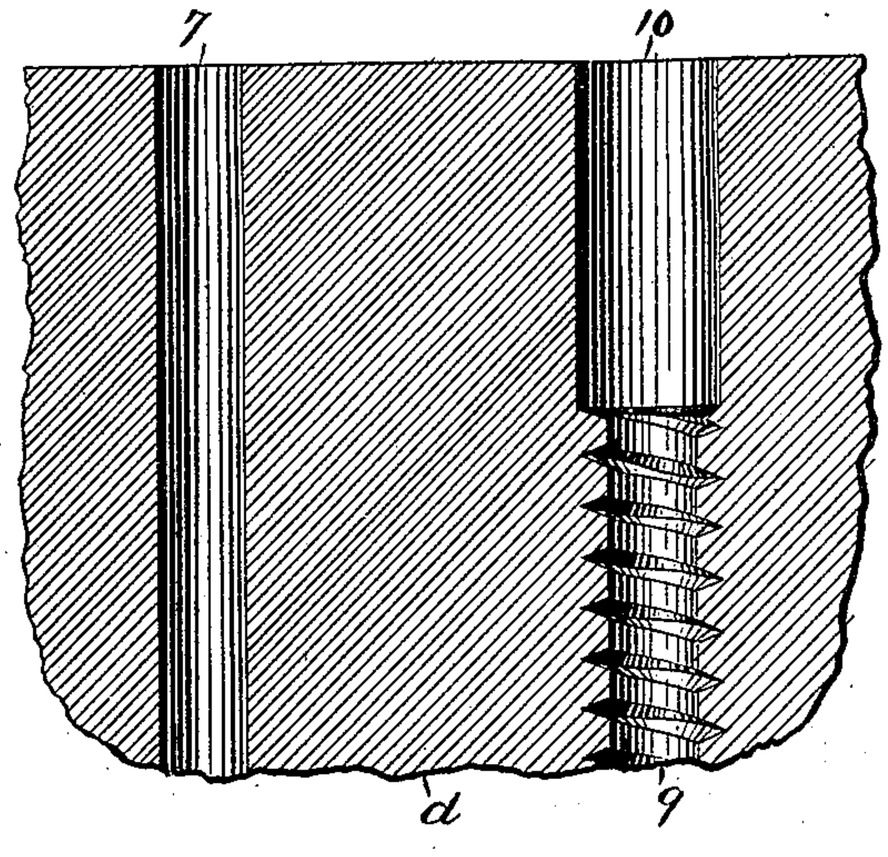


Fig. 5.



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UNITED STATES PATENT OFFICE.

HORACE K. JONES, OF HARTFORD, ASSIGNOR TO THE RUSSELL & ERWIN MANUFACTURING COMPANY, OF NEW BRITAIN, CONNECTICUT.

WOOD-SCREW.

SPECIFICATION forming part of Letters Patent No. 470,804, dated March 15, 1892.

Application filed November 11, 1891. Serial No. 411,608. (No model.)

To all whom it may concern:

Be it known that I, HORACE K. JONES, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Wood-Screws, of which the following is a specification.

My invention relates to improvements in wood-screws; and the objects of my improvement are to produce a wood-screw with a large or full shank that will ream its own way into the wood, to produce a gimlet-pointed wood-screw with a ribbed or fluted shank that will fill a hole substantially the same as with a solid shank, to produce a screw with a rolled thread that is straight throughout its length, to facilitate the manufacture of the screw, especially in rolling the gimlet-point, and in general to increase the efficiency and utility of the article.

In the accompanying drawings, Figures 1, 2, and 3 are each side elevations of my screw, differing from each other in minor details. Fig. 4 is a transverse section of my screw on the line *x x* of Fig. 1; and Fig. 5 is a sectional view of a piece of wood, illustrating the action of my screw.

a designates the gimlet-point; *b*, the threaded body, both of ordinary form; *c*, the shank, and *d* the ordinary beveled head and for which the ordinary half-round head may be substituted, if desired.

The screw-head is provided with a nick or slot to adapt it for engagement by a driver for turning the screw axially to force it into the wood.

The surface of the shank *c* is uneven and covered with elevations and depressions raised from the body of said shank by rolling or swaging, preferably in the form of spiral ribs 6, the diameter of the shank from the highest point of the ribs on one side to a like point on the opposite side being approximately equal to the diameter of the threaded body at the top or highest point of the thread. I prefer to form the thread by rolling-in dies; but the article may be produced by cutting the thread, although some of the advantages of my improvement are attained only in a rolled screw. The form of the spiral ribs 6 in cross-section is shown in Fig. 4; but said form is not essential. Neither is it essential that said ribs shall extend spirally along the shank, although the spiral form is preferred, because spiral ribs cover the complete circle of the shank as viewed in end view, and thereby have a better and firmer bearing in a round hole. I also prefer that the spiral ribs, although of a steeper pitch, shall extend in the same general direction as the screw-thread— that is, in a right-hand thread I form right-hand ribs.

Fig. 5 represents at *d* a block of hard wood with a hole 7 bored in it of a diameter about the same as that of the core 8 of the threaded body of the screw. At the right of this hole another hole is shown, into which one of my screws has been screwed and removed. This hole was before turning in the screw like the hole 7. 9 designates that portion thereof which received the threaded part of the screw and which is changed only by the marks of the thread, while 10 represents that portion of the hole that received the ribbed shank. In the act of turning in the screw the end of the shank nearest the screw-thread acts as a reamer and enlarges the diameter of the hole from that shown at the portion 9 to the plain cylindrical portion 10. Inasmuch as this portion 10 is made by the ribbed shank in working its way into the wood, it follows that said shank will fill and fit the hole thus formed. If the hole is not bored before turning in the screw—as, for instance, when used in soft wood—the gimlet-point and threaded body would form the portion 9 of the hole and the shank would still enlarge the hole where it enters and change the form of the hole from 9 to 10.

The screws shown in Figs. 1, 2, and 3 differ from each other mainly in the extent of the ribs over the shank and in the portion that is covered thereby. In Fig. 1 the ribs extend over the entire length of the shank from the head *d* to the threaded body *b*. In Fig. 2 the ribs extend only over the lower portion of the shank, leaving a plain portion 11 between the ribs and the head, the diameter of said plain portion being the same as that of the uneven or ribbed portion of the shank. In Fig. 3 the

ribs are on the upper portion of the shank, leaving a plain portion 12 larger than the core and smaller than the threaded body of the screw and ribbed portion of the shank, the same representing the original size of the wire. When the screw, Fig. 3, is turned into the wood, the plain portion 12 will by compression slightly enlarge the hole made by the core of the threaded body and the ribs will ream it out to the size of the ribbed portion of the shank. This form of screw is particularly adapted for long screws and saves ribbing the entire length of the shank.

In rolling a thread on a wood-screw the thread is so coarse that the screw is very liable to be and generally is bent where it runs out at the shank. By simultaneously rolling the ribs and the thread, especially spiral ribs, this bending at the junction of the shank and thread is prevented and a straight screw is produced. In rolling gimlet-pointed wood-screws there is a severe strain on the stock, having a tendency to force the work endwise away from the portion of the dies that thread the point. By simultaneously rolling the point, body, and shank the stock is much better held up to the work of threading the point.

In rolling a wood-screw there is a tendency of the blank to slip, so that it does not rotate in unison with the movement of the threading-dies, and to prevent this slipping it has been found necessary to transversely notch or roughen a considerable portion of the surfaces of the threading-dies. This is objectionable, because the thread produced is somewhat ragged and rough, instead of being smooth and solid.

By simultaneously rolling the ribbed shank and thread the dies which roll the ribs act in connection with the blank like a pair of racks and a pinion and insure the proper rotation of the blank, so that the dies may not be roughened and a smooth and solid thread can be rolled. While the elevations on the shank will in any event bear on the wall of the hole that is reamed out by said shank, it may be observed that the material cut from the wood in reaming out the hole firmly fills the depressions in the shank, so as to form practically a solid cylinder. Especially is this the case when the ribs are in the same general direction as the thread; but the depressions or grooves will be filled at the end of the shank nearest the thread, even if the ribs extend in the reverse direction from the thread.

I claim as my invention—

A wood-screw having a head adapted to be engaged by a driver for turning said screw axially, a series of elevations and depressions on its shank raised up from the normal diameter of the stock by rolling, a threaded body of a diameter approximately the same as that of the raised portion of said shank, and a threaded point, substantially as described, and for the purpose specified.

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