T. T. PROSSER.

SCREW.

No. 57,966. Patented Sept. 11, 1866.

Fig 0

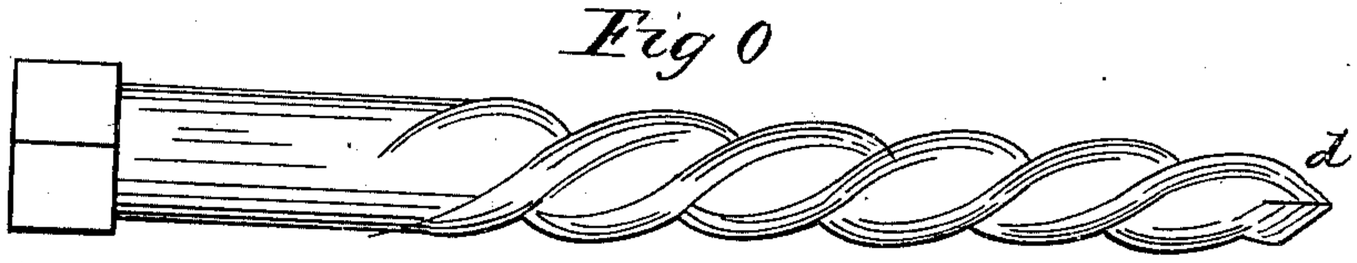


Fig 1.

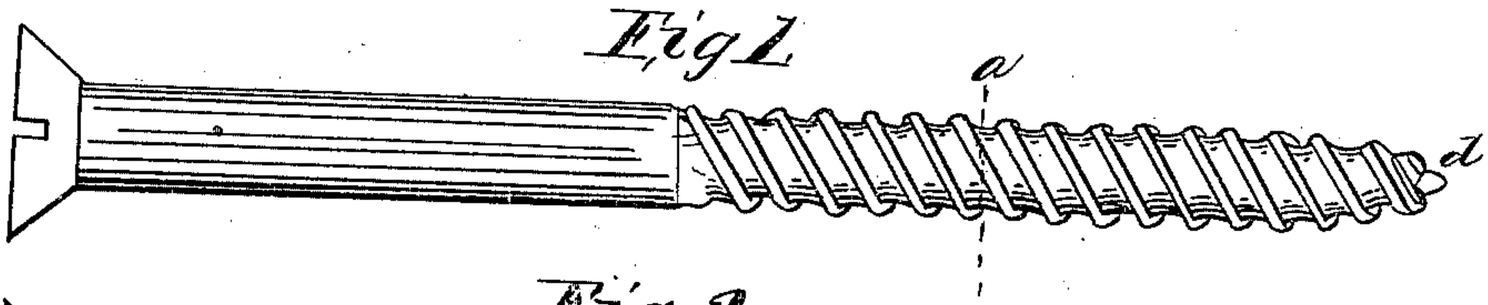


Fig. 5.

Fig. 2.

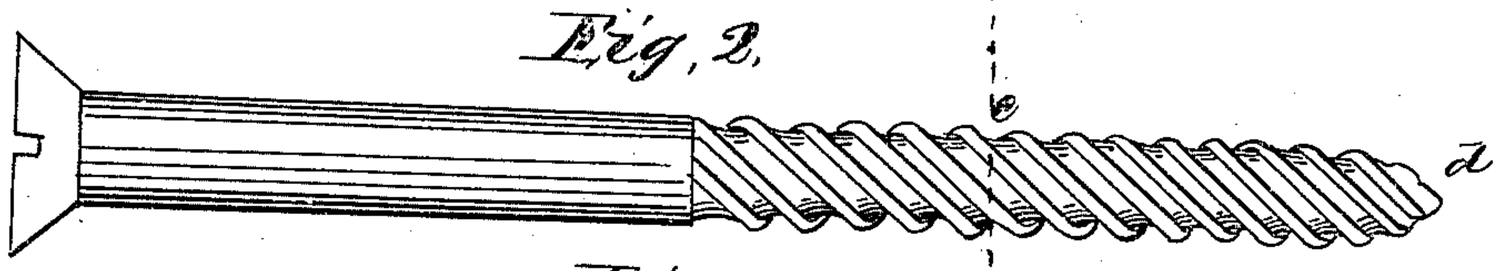
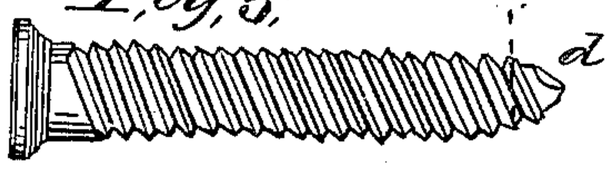


Fig 4

Fig. 3.



Witnesses.

C A Wayne

H H Evans

Inventor

Treat T Prosser

UNITED STATES PATENT OFFICE.

T. T. PROSSER, OF CHICAGO, ILL., ASSIGNOR TO HIMSELF, D. A. KIMBARK, D. W. WELLS, J. A. EASTMAN, AND G. W. GILLETT.

IMPROVEMENT IN SCREWS.

Specification forming part of Letters Patent No. **57,966,** dated September 11, 1866.

To all whom it may concern:

Be it known that I, TREAT T. PROSSER, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement on what are known in the arts and the trade as "Wood-Screws," of which improvement the following is declared to be a full, fair, and exact description, reference being had to the annexed drawings, forming a part of this specification, and in all of which drawings the same letter refers to the same part.

The first of these improvements relates to the thread and tapering body of the screw, as shown in Figs. 0, 1, and 2, and in the sections, Figs. 4 and 5; the second, to the form of the point in conjunction with the form of the threads and their intermediate spaces.

All wood-screws heretofore made, I believe, terminate either in a flat or abrupt point, or have their termination in a tapering round point, or in having a portion of the thread continued down over the tapering part to the point. In all of them the outer edge of the thread terminates in a sharp or more or less cutting-edge, while the body of the thread connects with the solid column or axis of the screw more or less abruptly, leaving a plain surface on the latter between the threads, and, from the rapid revolution of these threads, their pitch is reduced to such an extent as to make their line of resistance to withdrawal almost parallel to that of the body of the screw, and, as this form cuts or breaks the fibers of the wood at every turn it takes in advancing, it offers but little more adhesive power in keeping together the parts to which it is applied than an ordinary nail. In fact, carpenters and others often drive these screws, particularly those with sharp points, into the wood as they would a nail, and if it were not that they then give them one or two turns with the screw-driver to "drive them home" they would really be no better than, if as good as, a nail.

Although those screws of the kind which have a flat or abrupt point require a preparatory hole made by a gimlet, or other similar appliance, to make them enter, they, like those with a sharp point, break off the fibers of the wood through which they are driven, even when a screw-driver is used. Besides, after having been entered into the wood, they present but little more difficulty in being "driven home," or nearly so, than a pointed one. In both cases, whether driven or, as they ought always to be, screwed up to their place, if in their progress through the wood they meet with a hard place—a knot, for instance—they are almost inevitably driven aside from their straight direction, stopped altogether, broken, or bent if the course they ought to follow has not been prepared for them with a gimlet or auger.

The elements of a good wood-screw are, first, that it will enter the wood with reasonable application of force, and keep the direction intended, unless intercepted by some unexpected cause; that it should not cut the fibers of the wood, but compress them around the screw; that the line of revolution of the thread or pitch of the screw should be such that it can be either driven or screwed into its place; that it should require the smallest possible exercise of physical force to apply it in the manner desired, and when in place to offer the greatest resistance to the force tending to separate the parts to which it is applied.

Apply these principles to any of the ordinary screws on the market or in use, and we see at once their deficiencies and their failure to perform the functions anticipated in their use. When used in the end of a plank or piece of timber, and running in the direction of the fibers, by the sharp edges of the thread they necessarily cut these fibers and leave the screw with little or no better hold upon the wood than a gimlet would have. On the contrary, if the thread were, on all its edges, round, smooth, and not cutting, and the grooves between the threads also smooth and rounding, with no sharp angles between them, the inevitable consequence in all wood of any ordinary elasticity would be a compression of the fibers, which, by reaction, would form a tight impact around the screw, holding it so firmly in its place that only violence or the use of the screw-driver could remove it.

In the drawings, *a d*, Figs. 0, 1, 2, 3, and 6, represent the pyramidal or diamond point. This point, as seen in the latter figure, is three-sided, the angles which they form being equal; consequently the areas of the sides are equal. The threads of the screw either originate at

the termination of these angles, as seen in Fig. 0, or advance slightly upon the sides of the base of the pyramid, as seen at Figs. 1, 2, and 3. By having the sides of the pyramid of equal area they offer equal resistance in entering the wood, and consequently the screw, as it advances, follows a straight line, keeping the screw in the direction given it when starting. This point, whether driven in or entered by the action of rotation, opens the way for the threads of the screw to enter and follow in the same line; and, as the resistance is greater in any other direction, it must necessarily follow this line.

One of the most important peculiarities of this screw lies in the round surface of the thread, as seen in the cross-sections, Figs. 4 and 5. The first of these shows a two-threaded, and the second, Fig. 4, a three-threaded, screw, the first corresponding to Fig. 2, and the latter to Fig. 1. It is evident by the form of these threads that they cannot cut the fibers of the wood, and therefore, by their elasticity, the wood must yield where, then, these threads are pressing upon it, but leaving them in place between the threads, or at least so much less compressed that they fill up compactly these intermediate spaces.

In the construction of these screws to carry out the principle upon which they are organized and the purposes to which they are to be applied, I give a greater pitch to the threads than has heretofore been used. The quick turns—that is, the short pitch heretofore used—involve the necessity of breaking, tearing, or cutting the fibers of the wood to give space sufficient for the screw to enter. By sloping—that is, lengthening—the pitch of the thread this is avoided, and gives to the screw an opportunity to revolve on its axis as it advances, even when driven by a hammer instead of a screw-driver. The pitch I prefer is about forty-five degrees.

Having thus fully described my invention, what I claim therein, and desire to secure by Letters Patent of the United States, is—

1. A screw having its threads of a convex form, with a concave form of the space between them, when combined with a tapering form from the commencement of the threads to the point.

2. The combination of a pyramidal point with the threads of a two or three threaded screw, when the screw and intermediate spaces are constructed substantially as set forth.

TREAT T. PROSSER.

Witnesses:
P. A. HOYNE,
H. H. EVARTS.