

R. Kitson,
Securing Iron Pins to Wood.
No. 111,947. Patented Feb. 21, 1871.

Fig. 1.

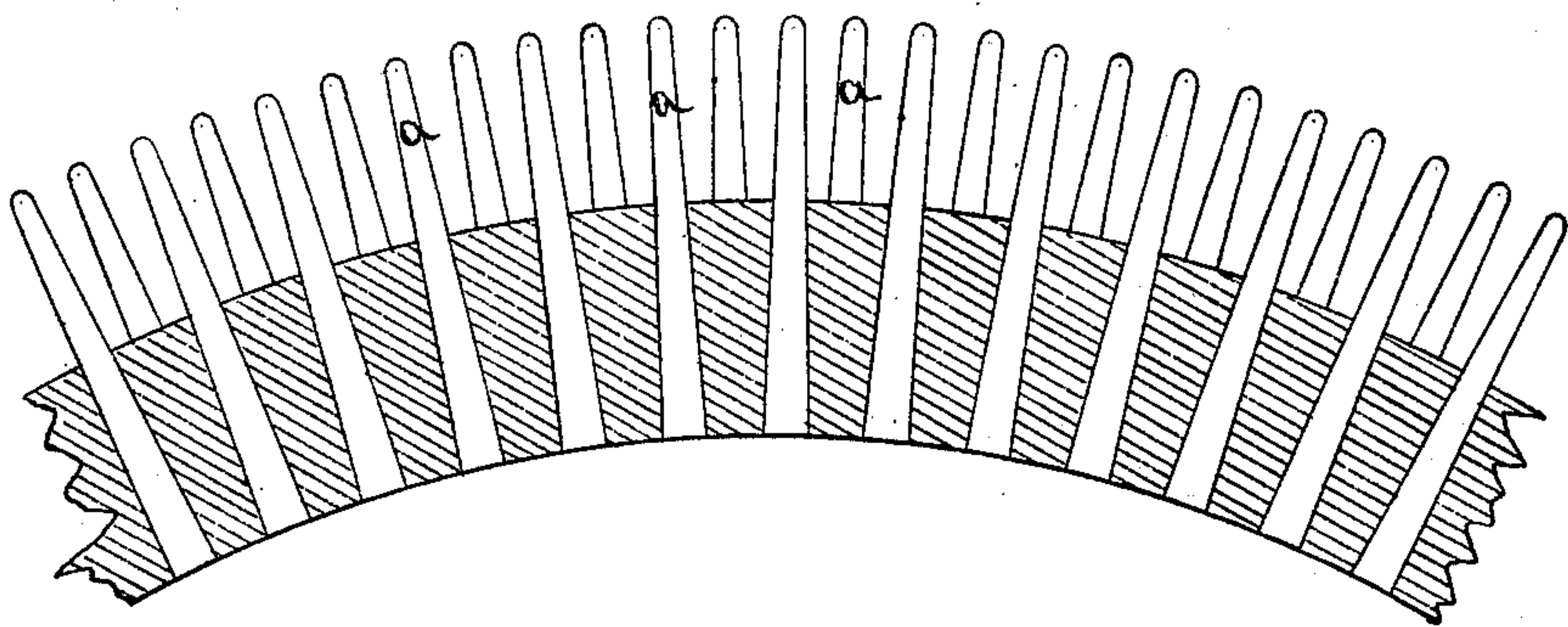
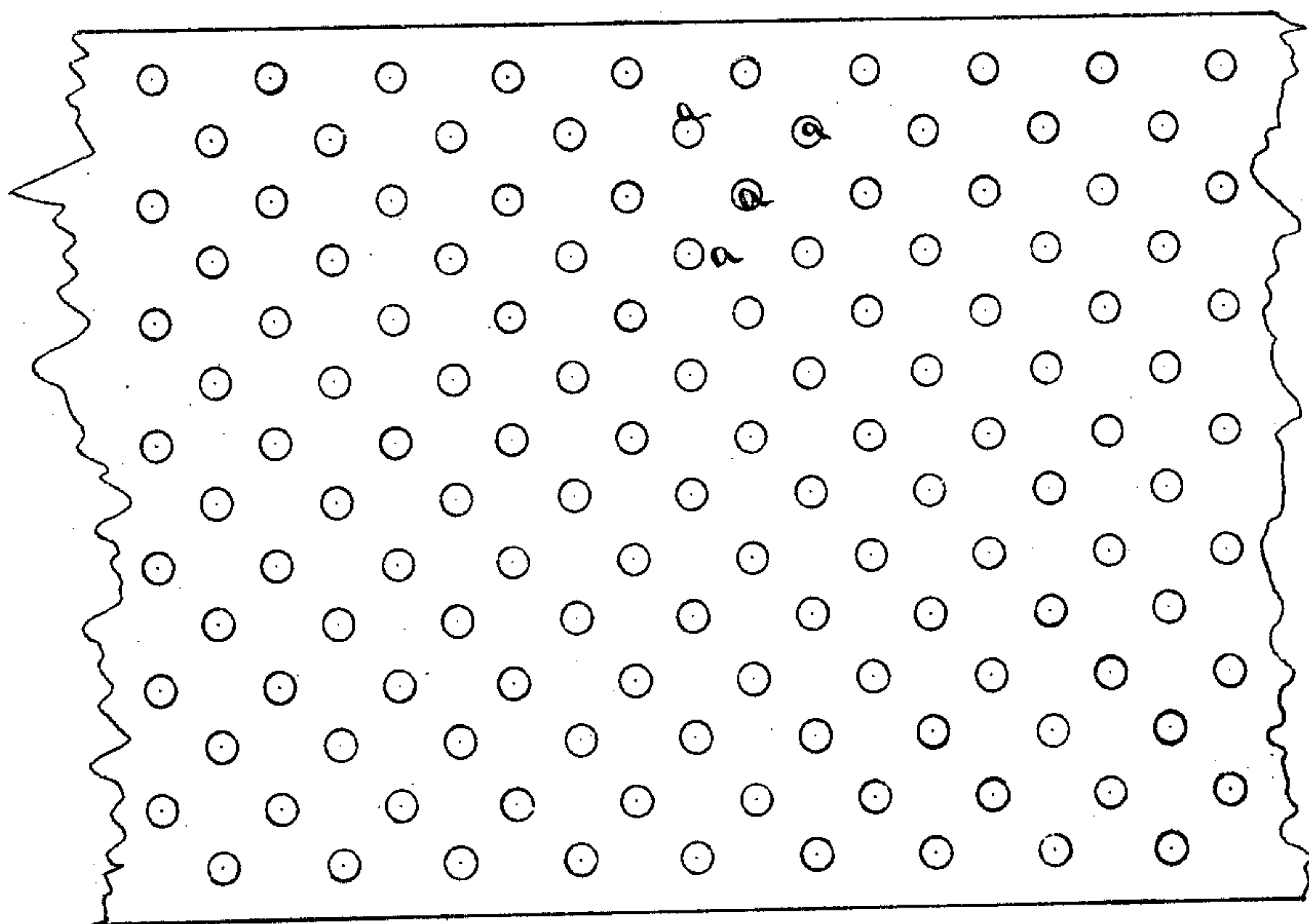


Fig. 2.



Witnesses
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RICHARD KITSON, OF LOWELL, MASSACHUSETTS.

Letters Patent No. 111,947, dated February 21, 1871.

IMPROVEMENT IN SECURING STEEL OR IRON PINS IN WOOD.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, RICHARD KITSON, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Securing Steel or Iron Pins in Wood, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification.

This invention relates to the mode or means of fastening steel or iron bolts, pins, teeth, or prongs in wood, and has for its object more permanent security of such bolts, pins, or teeth, without splitting the wood, especially where such bolts, pins, or teeth are set in close proximity to each other, the means employed being a corrosive agent, which acts upon steel or iron, and increases its holding capacities without injury to the wood.

The corrosive agent above referred to, and which I employ for securing steel or iron bolts or pins in wood, is sulphuric acid diluted with water in about the proportions of from three to five parts of water to one of the aforesaid acid, the latter being common sulphuric acid of commerce.

To the above-described solution of acid I add as much well-dissolved thick glue as will render it adhesive when dry, both the glue and the acid solution being heated when mixed together or while mixing. I have found a good proportion of the glue and the acid solution to be about two pints of the thick glue to one pint of the acid solution, and this I generally apply while in a heated state.

In the absence of the acid, common salt in solution will answer a very good purpose, and the salt solution should be made as strong as possible by dissolving, in a given quantity of water, all the salt it will dissolve, and this strong brine or acid solution, while heated, is mixed with the heated thick glue.

Although preferring glue for the adhesive agent, I contemplate the employment of another well-known adhesive substitute, which will combine with the salt or acid solution, and prepared and applied as described. First, boring the holes in the wood of suitable size to admit the iron bolts, pins, or teeth without hard driving, or so that they may be driven near together without splitting the wood.

After thus boring the holes in the wood I generally apply some of the previously-described solution in the holes thus bored, so as to saturate the wood around the holes. I also apply some of the aforesaid solution to each bolt, pin, or tooth before driving it into a hole in the wood thus prepared to receive it, and then drive each pin to its desired position.

The acid or saline solution soon attacks the iron or steel teeth or pins, and continues to act upon the same until each pin becomes firm and strong in its

setting, and, if projecting from the wood at one or both ends, such firmly-secured pins or teeth will endure great strain and service without becoming loosened; but in each case of securing the pins as above described, from six to ten days should be allowed for the corroding agent to act upon the metal, and thereby form a suitable connection with the wood.

This invention is adapted for use in various ways and in various kinds of machinery, apparatus, or structures, among which I would name bolts and spikes in the planking of ships, which, although are eventually secured by corrosion, (say in two to ten years,) are more hastily secured than by the old natural means.

Bolts, rivets, and other fastening devices in carriages, cars, and other like structures, and in various kinds of machinery, may be secured by my improvement without any liability of splitting or injuring the wood through which such devices are driven.

Teeth, pins, or prongs used in machinery for working, picking, or opening wool or other fibrous substances, or for opening and picking fibrous yarns or waste, may be advantageously set and secured by my improved process and invention.

To illustrate my said invention, and for the purpose last above described, the accompanying drawing is referred to.

In the said drawing—

Figure 1 represents a section of a wooden cylinder having a series of pins, teeth, or prongs, *a*, projecting from one surface.

Figure 2 represents a plan of the same, the pins or teeth being set close together.

The above-described drawing will illustrate my invention and the manner of practicing the same, the principal difference between this use and the uses previously described being the diameter or size of the pins and the adaptation thereof for different structures.

In practicing my said invention as hereinbefore described it will be readily seen that a new result is produced, and that there is a new mode of action, which is as follows:

When the adhesive and corroding solution is applied to the interior of the hole bored for the bolt or the pin, and to the exterior surface of the latter, the wood becomes saturated with the substance and retains it in nearly the same condition, but gradually drying for a number of days as the acid or the salt retard the drying process, giving time for the corroding properties or the corroding action of the acid or salt to work on the iron or steel and gradually raise a roughness on its surface, and thus gradually fasten it to the wood while in the process of drying or evaporating.

The corroding agent seems to have no injurious effect upon the wood, but the adhesive agent, when

dried, leaves the fibers of the wood around the corroded bolt or pin much stiffer and stronger than when in its natural state, thereby increasing the holding or retaining power of the wood as well as the iron or steel, the corroding agent acting upon the iron or steel, and the adhesive agent acting upon the wood, and both acting in connection with each other to firmly fasten the iron in the wood without injury to the latter, but to the contrary increasing its holding capacity.

It will also be seen and understood that when the iron bolt or pin is driven into the hole in the wood most of the woody fibers around the bolt or pin are turned inward in the same direction that the bolt is driven. These woody fibers remain in their turned position, being forced there by the driven pin, until corrosion of the metal takes place at the junction of the iron and the wood, and among the turned woody

fibers, which, when they become dry and stiff, in connection with the corroded surface of the iron, will resist almost any force to withdraw or drive out the bolts or pins thus secured.

The above I consider a new result from a new mode of action, visible, tangible, and capable of enjoyment.

I claim as my invention—

The method, substantially as described, of fastening steel or iron bolts or pins in wood by means of an adhesive and corroding agent applied as specified, and by driving or forcing the bolt or pin into the wood, as set forth.

RICHARD KITSON.

Witnesses:

JOHN E. CRANE,
A. A. HART.