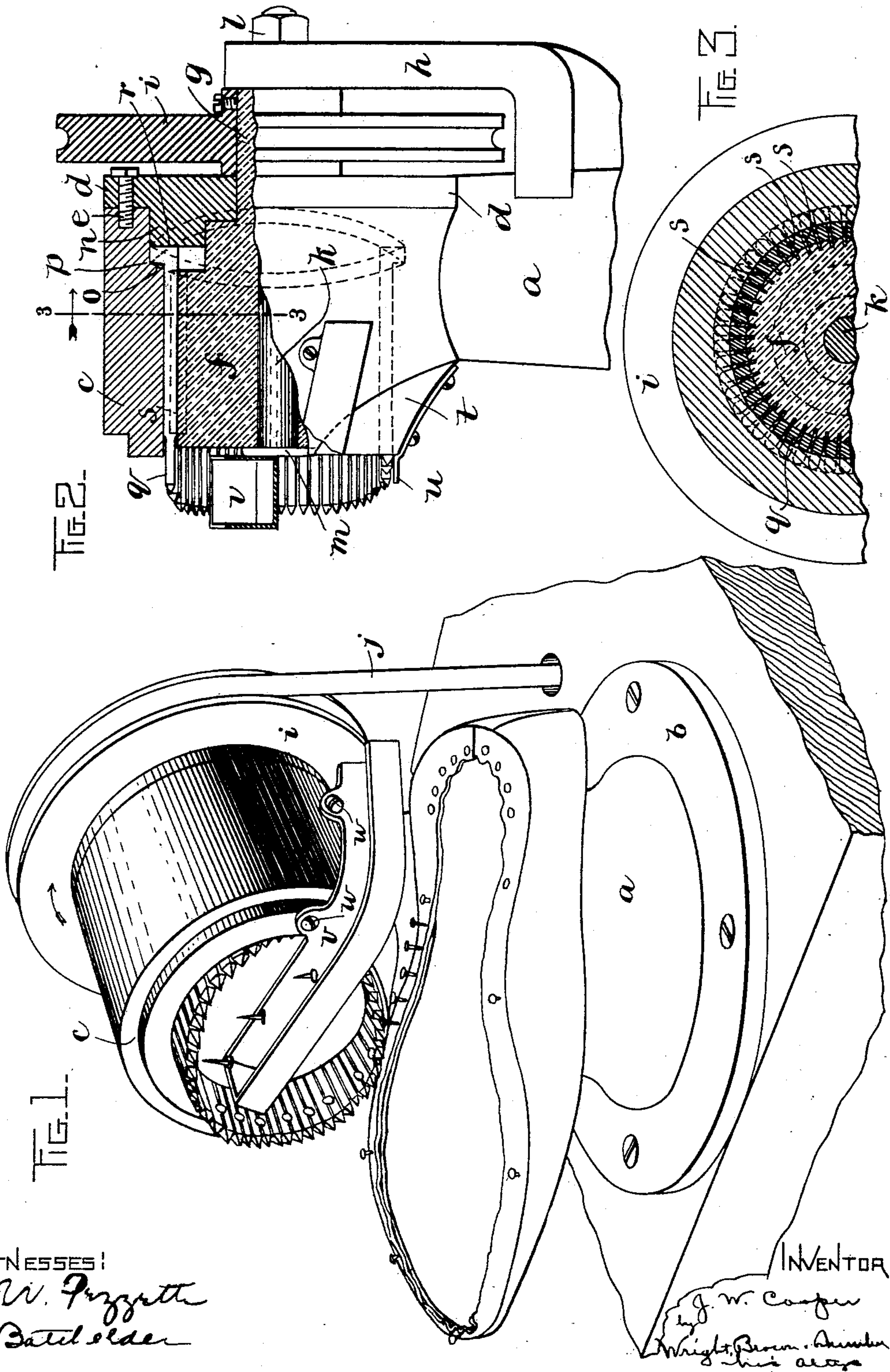


(No Model.)

J. W. COOPER.  
TACK PULLING MACHINE.

No. 593,391.

Patented Nov. 9, 1897.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

JOHN W. COOPER, OF BROCKTON, MASSACHUSETTS.

## TACK-PULLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 593,391, dated November 9, 1897.

Application filed August 19, 1896. Serial No. 603,174. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. COOPER, of Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Tack-Pulling Machines, of which the following is a specification.

This invention consists of a machine for removing from the inner soles of boots and shoes the lasting-tacks employed for temporarily securing the uppers thereto, which machine is provided with certain novel features, as shown upon the drawings and now to be described in detail and then pointed out in the claims.

Reference is to be had to the accompanying drawings, and to the letters and figures marked thereon, forming a part of this specification, the same letters and figures designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a perspective view of one form of machine embodying my improvements, the machine being illustrated in the act of removing the lasting-tacks from a partially-formed shoe. Fig. 2 is a partial vertical longitudinal section, the base of the standard being broken away. Fig. 3 is a section on the line 3 3 of Fig. 2.

In carrying out my invention, which is not limited, however, to the machine shown in the drawings and now to be described, I employ a standard *a*, having a circular base *b*, which may be secured to the working-bench by screws passed through apertures therein. The standard is preferably formed with a cylindrical bearing *c*, having its rear end partially closed by a cap *d*, secured thereto by screws *e*. Within the bearing is mounted a revoluble wheel *f*, having a hub *g*, extending through an aperture in the cap *d* and abutting against a bracket *h*, which is secured to the standard.

The belt-wheel *i* is rigidly secured to the hub *g* and is driven by a belt or cord *j*, which receives its power from any suitable source. A bolt *k* passes centrally through the wheel *f* and is journaled in the bracket *h*, being provided at its threaded end with a nut *l*, and its opposite end having a head *m*. When the belt or cord *j* rotates the pulley *i*, the wheel *f* is rotated within the bearing *c*.

The cap *d* is formed with an annular ring or flange *n*, extending into the bearing, which is cut away to receive it, so that between the vertical end wall of the ring and the shoulder *o* in the bearing a groove *p* is formed. This groove is arranged to provide a cam-track for a purpose to be described.

The wheel *f* is slightly less in diameter than the internal diameter of the bearing *c*, so as to leave a space between them for the reception of movable teeth *q*, which are arranged side by side entirely around the wheel. They are arranged to move axially of the wheel freely, but are carried around with the said wheel as it rotates, each tooth being disconnected from its next adjacent tooth, so as to be movable independently thereof. Each tooth consists of a bar having a pointed reduced outer end and at its inner end a finger *r*, extending into the cam-track *o*, said bar lying in a slideway formed by strips *s s*, set into the wheel. Now it will be seen that as the wheel *f* is rotated the teeth will be revolved around their axis and at the same time will be moved in and out by reason of the fingers *r* extending into the cam-track. The teeth may be regarded as being arranged in a series of pairs, although each tooth of each pair may coact with the adjacent tooth of the next pair for gripping a tack to withdraw it, as will be afterward explained. The cam-track is so arranged and the fingers are of such length that for a portion of their revolution they will be withdrawn until their points are flush with the face of the wheel *f*, and when they reach the lowest point of their revolution they will be projected forwardly, as illustrated in Fig. 1, and will remain forward until they have passed their highest point. The bearing is cut away, as shown at *t*, and is provided with a rest *u*, projecting beneath the teeth and against which the partially-finished boot or shoe is placed and pressed.

In manufacturing shoes it is the custom to draw the uppers taut over the last and to secure their edges temporarily to the insole by tacks driven thereinto, as shown in Fig. 1. Then after the leather is set all of the tacks, with the exception of three or four, are withdrawn and the shoe is sewed.

This machine may be employed for with-



drawing one or a number of tacks. The last is placed against the rest *u* with the tacks 2 in front of the teeth. Then as the wheel *i* is revolved the teeth are projected forwardly, 5 passing on each side of the tacks and grasping them to draw them out of the upper and carry them away therefrom, as will be readily understood, the rest resisting the upward pull upon the last. The last is advanced 10 automatically as the tacks are withdrawn, so that the action of withdrawing the tacks is practically continuous, the teeth being small enough to extend between the tacks placed practically at any distance apart.

15 All of the tacks may be withdrawn by the machine or else a few may be skipped, as desired.

The chute *v* is arranged to extend into position under the projecting teeth to receive 20 tacks as they are dropped therefrom when the said teeth reach their highest point of revolution and is secured by screws *w* to the bearing *c*, it also extending back of the machine to drop the tacks into some convenient 25 receptacle.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it 30 may be made or all of the modes of its use, I declare that what I claim is—

1. A machine for withdrawing tacks having a series of pairs of independently-movable teeth and means for causing each pair of 35 teeth to engage the tacks and withdraw them from the last.

2. A machine for withdrawing tacks having a series of teeth, means for revolving said teeth about a common center, and means for 40 moving said teeth to cause two of them to engage a tack on both sides to withdraw it.

3. A machine for withdrawing tacks having

two or more tack-engaging teeth, and means for bodily moving said teeth to cause two of them to engage and withdraw each tack. 45

4. A tack-withdrawing machine having two or more teeth, means for bodily moving said teeth forward to engage the tack on each side thereof, and means for moving said teeth 50 bodily upward to carry with them the tack, thereby withdrawing it from the last.

5. A machine for withdrawing tacks, having a series of teeth arranged axially around a common center, means for revolving said teeth about the said common center, and 55 means for moving them longitudinally in one direction during a portion of their revolution and moving them in the other direction during the remainder of their revolution.

6. A machine for withdrawing tacks comprising in its construction a standard having 60 a bearing, a revoluble wheel arranged in the bearing, and movable teeth supported by said wheel and arranged to move longitudinally independent of said wheel whereby they are 65 moved into and out of engagement with the tacks.

7. A machine for withdrawing tacks, having a standard, a bearing on said standard with an internal cam-track, a wheel in said bearing having axially-arranged guides in its periphery, and nail engaging and withdrawing teeth arranged in the guides in said wheel and each having a finger extending into the cam-track. 75

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of August, A. D. 1896.

JOHN W. COOPER.

Witnesses:

E. BATCHELDER,  
P. W. PEZZETTI.