(No Model.)

W. E. LAWRENCE.

NAIL EXTRACTOR.

No. 307,472. Patented Nov. 4, 1884.

fig 1.

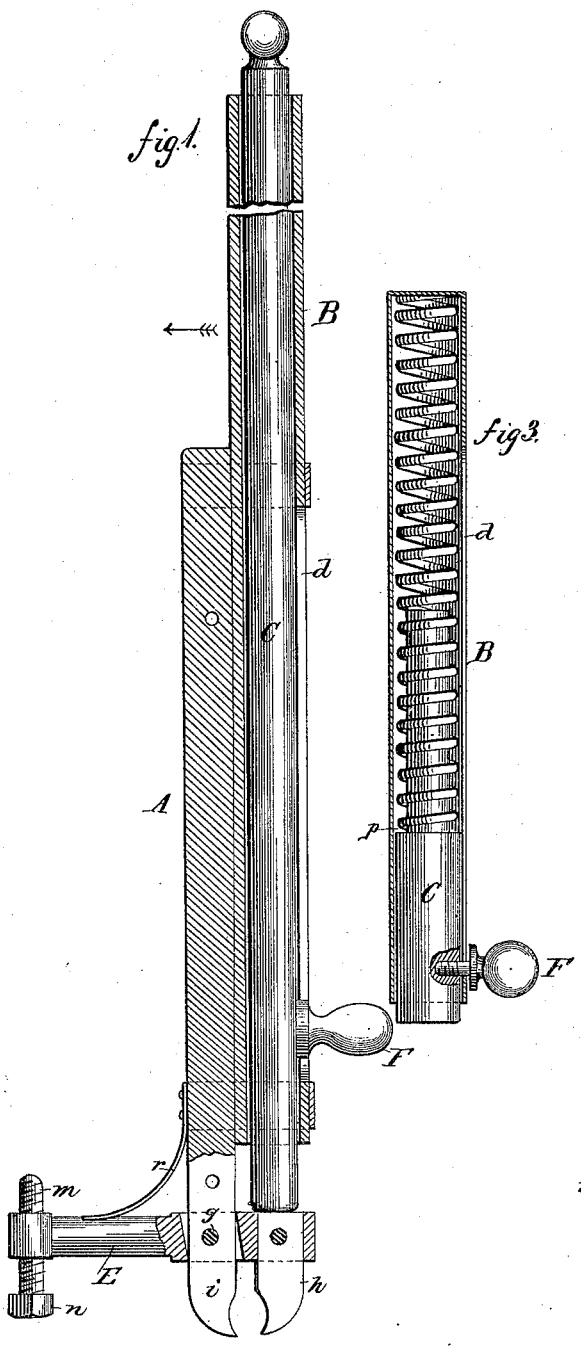
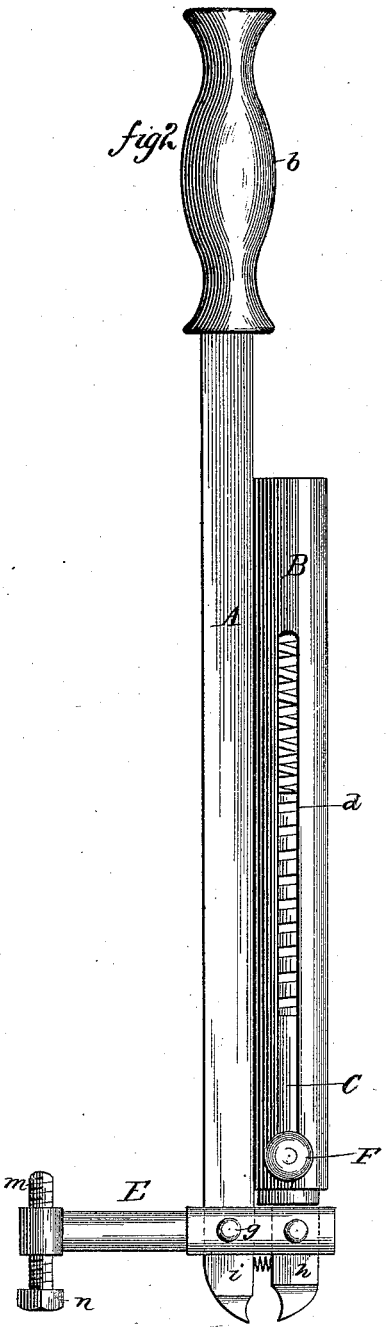


fig 3.

fig 2.



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UNITED STATES PATENT OFFICE.

WILLIAM E. LAWRENCE, OF NEW YORK, N. Y.

NAIL-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 307,472, dated November 4, 1884.

Application filed April 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. LAWRENCE, a citizen of the United States, residing at New York, in the county of New York and State of York, have invented certain new and useful Improvements in Nail-Extractors, of which the following is a specification.

My invention relates to devices for extracting nails from boxes, boards, or other like places; and it consists, essentially, of an extractor provided with jaws and with a hammer for driving or embedding the said jaws into the material from which it is desired to withdraw the nails, as fully described hereinafter.

It further consists in providing the extractor with an adjustable fulcrum to adapt the device for extracting nails without bending the same. It also consists in certain other details of construction, which will be fully hereinafter described.

In the drawings, Figure 1 is a sectional elevation of a nail-extractor embodying my invention. Fig. 2 is a side elevation of a modified form of the device shown in Fig. 1, and Fig. 3 is a sectional elevation of the casing or guide for the operating-hammer when the parts are arranged as shown.

A is the shank of the extractor, terminating at its lower end in a jaw, *i*, of the usual form in devices of this character.

To one side of the shank A, a short distance above the jaw *i*, is secured a metallic cylindrical casing, B, or other suitable guide for the operating-hammer C. The guide B extends above the shank A a suitable distance to form a convenient handle by which the extractor can be held when in use.

Pivoted at *g*, near the lower end of the shank A, is a short horizontal lever, E, carrying at one end and in direct line of the path of the hammer C a jaw, *h*, corresponding in shape to the jaw *i*, these two parts constituting together the clamping-jaws of the extractor. The opposite end of the lever E is provided with an adjustable pin, *m*, provided on its lower end with a head or enlarged bearing-surface, *n*.

In one side of the guide B is a longitudinal slot, *d*, through which extends a handle, F, secured at its inner end to the hammer C. The hammer C is prolonged to constitute a stem, which projects above the upper end of the casing, and with the hammer is of such a weight that when elevated within the casing B and permitted to fall the desired effect is produced upon the clamping-jaws *h i*.

To drive the jaws *h i* into the material surrounding the head of the nail to be withdrawn, the hammer C is elevated within the casing B by the handle F until the limit of its upward movement is reached at the termination of the slot *d*. The hammer is then permitted to fall by its own weight, and is thus brought to bear on the lever E directly above the jaw *h* with great force, and effectively drives its point into the material confining the nail. This operation is repeated until the desired effect is produced. The downward movement of the lever E, from the effects of the blows of the hammer C, serves to carry with it the shank A, thus simultaneously driving both clamping-jaws *h i* into the material. Should the force of the blow from the falling hammer be insufficient, it may easily be increased by thrusting the hammer downward by the handle F, thereby greatly adding to the force of the blow.

In the form of extractor shown in Fig. 2 the shank A projects above the casing B, and terminates in a tang provided with the usual wooden handle, *b*, by which the device is held. In this instance the hammer C and casing B are much shorter, and the latter is closed at its upper end, and interposed between the upper end of the hammer C and cylinder B is a stout spiral spring, D, which serves as a means of forcibly propelling the hammer to drive the ends of the clamping-jaws into the material surrounding the head of the nail to which they are applied. The upper end of the hammer C, against which the spring D bears, may be perfectly flat, or, as preferred and shown, it may be reduced in size to form a shoulder, *p*, constituting the bearing-surface of the lower end of the spring, while the reduced end of the hammer, projecting up into the spring, serves to retain the same in its proper position, thereby preventing its lateral movement within the cylinder B. If, as usual, the fulcrum were fixed, short nails could be extracted without injury; but in drawing out long nails the movement of the jaws around the fulcrum-

point would cause the nails to be bent or broken. To overcome this great objection I provide my extractor with an adjustable fulcrum-pin, whereby the curve in which the jaws travel is increased and there is less tendency to bend the nail. After the jaws have been driven into the wood the upper end of the shaft A is moved to one side in the direction of the arrow, Fig. 1, when the jaws *h i* will be brought together upon the head of the nail to forcibly grip the same, and by the continued side movement of the shaft A the nail will be easily withdrawn. When the lever E is relieved from pressure the jaws *h i* are forced apart by a flat spring, *r*, secured to the shank A, and bearing on the upper side of the lever E, as in Fig. 1; or a spiral spring may be interposed between the jaws, as in Fig. 2.

In the operation of the form shown in Fig. 2 the hammer is retracted within the casing B by the upward movement of the handle F, thus compressing the spring D between its bearing *p* and the upper end of the casing B until the upward movement of the handle F is checked by the termination of the slot *d*. The handle F is then released and the spring D suddenly expands, thereby forcibly projecting the hammer C upon the lever E with the same effect as in the other case.

I claim—

1. In a nail-extractor, the shank A, carrying one of the jaws, an operating-hammer, guided to slide vertically at one side of the shank, and a jaw supported by movable connections and arranged beneath said hammer, substantially as set forth.

2. In a nail-extractor, the shank carrying the jaws and provided at one side with a guide for a vertically-sliding hammer, said guide extending above the upper end of the shank and constituting the handle of the extractor, substantially as set forth.

3. In a nail-extractor, a shank carrying the jaws, a sliding hammer for driving the jaws into the material surrounding the head of the nail, and a spring arranged to be compressed as the hammer is raised, all substantially as set forth.

4. In a nail-extractor, the shank A, carrying the jaws, and the guided operating-hammer sliding in a casing, and a spring for forcing the same against one of the jaws, in combination with a handle for retracting said hammer within the casing, thereby compressing said operating-spring, substantially as set forth.

5. In a nail-extractor, a shank terminating in one of the jaws, a lever carrying the other jaw and pivoted to the shank, and a sliding hammer arranged to strike the latter jaw, substantially as described.

6. The combination of the shank, sliding hammer, pivoted lever carrying one of the jaws and provided with a vertically-adjustable fulcrum-pin, substantially as described.

7. In a nail-extractor, the shank A, having a jaw at its lower end, in combination with a horizontal lever pivoted to said shank, and carrying at one end one of the jaws and at the opposite end an adjustable fulcrum-pin, and a vertically-sliding hammer and operating-spring, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM E. LAWRENCE.

Witnesses:
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WM. H. WOODHULL.