

E. H. REUSSE.
NAILER.

No. 552,331.

Patented Dec. 31, 1895.

Fig. 1

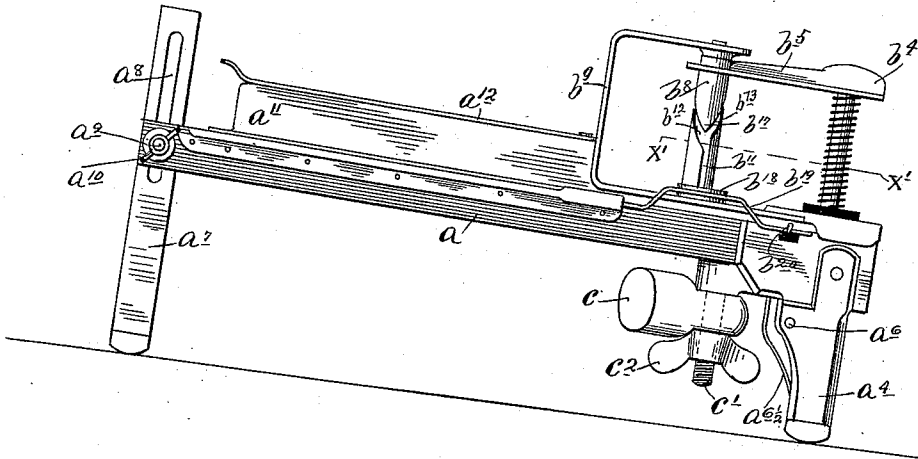


Fig. 2.

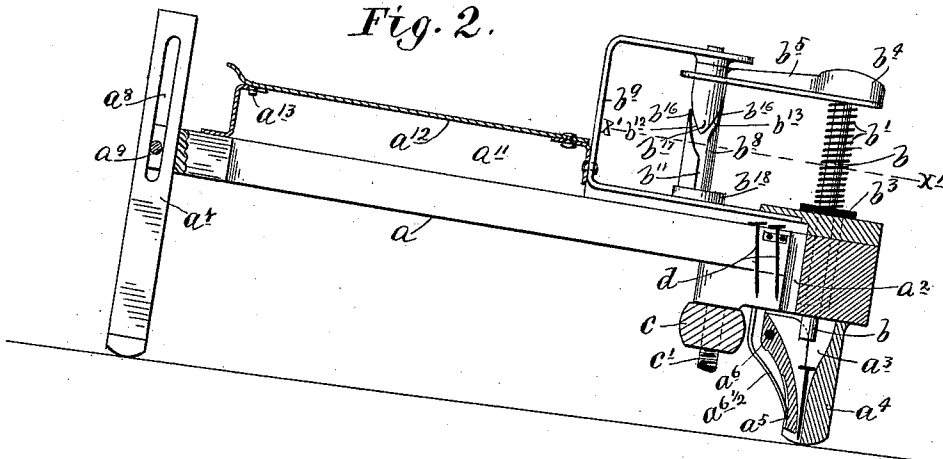


Fig. 3.

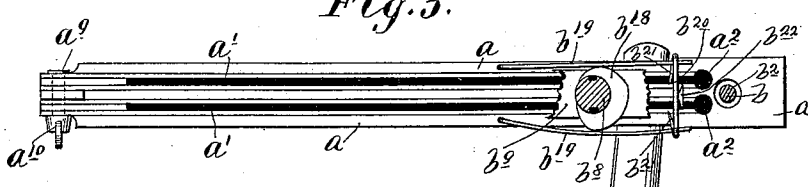
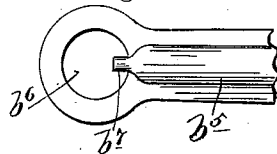


Fig. 4.



Witnesses.
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Fig. 6.

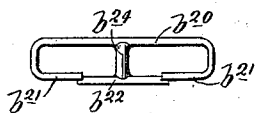


Fig. 5.

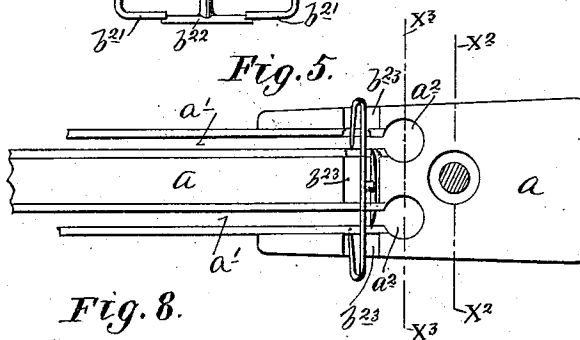


Fig. 7.

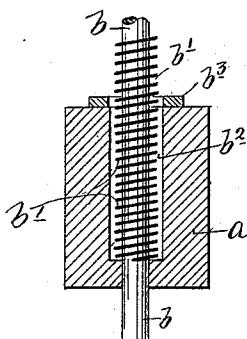


Fig. 8.

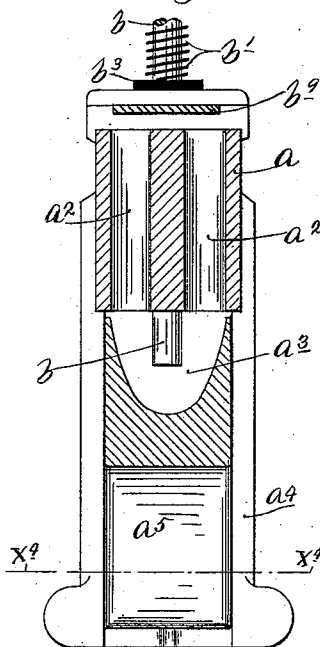


Fig. 10.

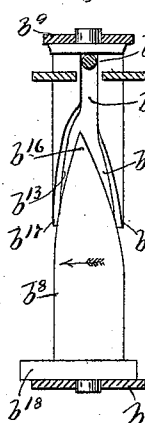


Fig. 11.

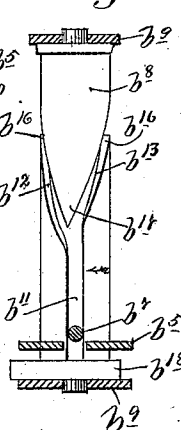
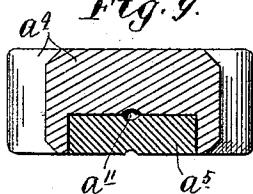


Fig. 9.



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Jas. F. Williams.

(No Model.)

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3 Sheets—Sheet 3.

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Fig. 12.

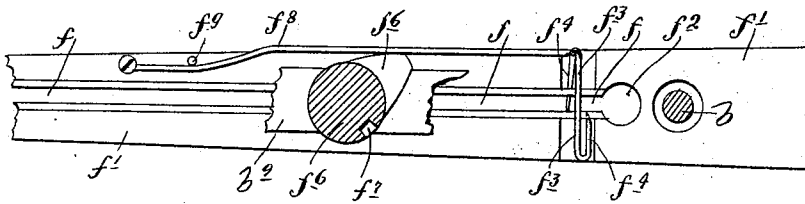
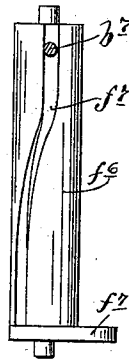


Fig. 13.



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By his Attorney,
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UNITED STATES PATENT OFFICE.

EDWARD H. REUSSE, OF FULDA, MINNESOTA, ASSIGNOR OF ONE-HALF TO
WILLIAM JACOBY, OF SAME PLACE.

NAILER.

SPECIFICATION forming part of Letters Patent No. 552,331, dated December 31, 1895.

Application filed September 21, 1894. Serial No. 523,690. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. REUSSE, a citizen of the United States, residing at Fulda, in the county of Murray and State of Minnesota, have invented certain new and useful Improvements in Nailers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved nailer, especially adapted for use in nailing shingles, but also capable of general application for driving nails.

To this end my invention consists of the novel features of construction hereinafter fully described, and defined in the claims.

My invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts—

Figure 1 is a side elevation of the machine. Fig. 2 is a vertical longitudinal section of the same in the plane of one of the nail-slots with some parts broken away and others shown in elevation. Fig. 3 is a plan view of the nail-chute with some parts shown in horizontal section on the line $X'X'$ of Fig. 1 with some parts removed and others broken away. Fig. 4 is a detail in section showing the relation of the cam-lever and the cam-shaft. Fig. 5 is a plan view, on an enlarged scale, of a part of the nail-chute for showing the cut-off device. Fig. 6 is a plan view of the cut-off device detached. Fig. 7 is a vertical section on the line X^2X^2 of Fig. 5. Fig. 8 is a vertical section on the line X^3X^3 of Fig. 5, looking from the left. Fig. 9 is a horizontal section on the line X^4X^4 of Fig. 8; and Figs. 10 and 11 are elevations of the cam-shaft detached with some parts shown in section, illustrating opposite sides of the said shaft. Fig. 12 is a view chiefly in plan, but partly in elevation, illustrating a modification wherein a single nail-chute and a single-acting cut-off device are employed. Fig. 13 is a side elevation of the cam-shaft employed in the device, as shown in Fig. 12, with the engaging part of the cam-lever shown in section.

a represents the body of the nail-chute, which, as shown in the principal views, is provided with a pair of nail slots or channels a' . These slots a' terminate in vertical passages

a^2 , leading to a funnel-shaped outlet a^3 , formed in a discharge-head a^4a^5 . The part a^4 of this discharge-head is formed rigid with the lower end of the nail-chute body, and the part a^5 is pivoted thereto, as shown at a^6 , and is subject to the action of a spring a^{6b} , which makes the same operate as a yielding clamping-piece to hold the nail in the outlet-funnel a^3 until operated upon by the nail-driving plunger b . At its upper end the nail-chute body is supported by an adjustable leg a^7 having a slot a^8 , through which and the side pieces of the chute-body passes a clamping-bolt a^9 , engaged by thumb-screw a^{10} , for securing the said leg in any desired adjustment, so as to set the nail-chute at any desired angle for the proper movement of the nails under the action of gravity. To the top of the nail-chute body a and directly over the nail-slots a' is located a magazine a^{11} , with a pivoted cover a^{12} held in closed position by spring-lug a^{13} , engaging with the corresponding hole in the upper end wall of the magazine.

The nail-driving plunger b is spring-seated in the lower end of the nail-chute body, as clearly shown in Figs. 2 and 7. The spring b' encircles the stem of the plunger and works in a recess or seat for the same formed in the lower end of the chute-body a , as shown at b^2 in Fig. 7. The plunger b and the spring b' work through a rubber washer b^3 , which, as shown, is fixed to the top of the chute-body a , and which serves to cushion the plunger at the end of its downward stroke. The plunger has rigidly attached thereto at its upper end a head-piece b^4 adapted to receive the stroke of a mallet, hammer, or other driving-tool. The head-piece b^4 has formed rigid therewith a projecting lever-arm b^5 , having a hole b^6 there-through at its outer end, and provided with a tongue b^7 projecting into the circle of said opening b^6 . The said arm b^5 sleeves over a cam-shaft b^8 , pivoted or journaled in a bracket b^9 , fixed to and rising from the chute-body a , and the tongue or projection b^7 from said lever-arm b^5 works in cam-channels extending lengthwise and spirally of the said shaft b^8 . These cam-channels are arranged to turn the shaft b^8 in a continuous direction one-quarter turn on each stroke of the plunger and the cam-lever b^5 carried thereby. To accom-

plish this result there are two cam-channels b^{10} lengthwise of the said shaft b^8 , diametrically opposite each other, on the upper section of the same, two corresponding cam-channels b^{11} opposite each other, lengthwise of the shaft on the lower section of the same, but on the quarters of the circle, with respect to the channels b^{10} and four cross-over or spiral channels, comprising two down members b^{12} and two up members b^{13} , as shown in Figs. 10 and 11. The angular point b^{16} is so related to the channel b^{10} that the tongue b^7 on the cam-lever will shift into the channel b^{12} on the downstroke of the said cam-lever, and the point b^{17} is so related to the cam-channel b^{11} that the tongue b^7 will shift into the channel b^{13} on the upstroke of the said cam-lever. There are two of the points b^{16} and two of the points b^{17} diametrically opposite to each other. Hence on each stroke of the cam-lever b^5 the point b^7 will shift from one of the channels b^{10} to the next adjacent channel b^{11} through one of the cross-over channels b^{12} or b^{13} , and will operate to turn the shaft a quarter-turn in a continuous direction, as shown by the arrow.

The shaft b^8 carries at its lower end a cam b^{18} , which is operative, in succession, on each of a pair of spring-rods b^{19} , which rods are hooked into the nail-chute body a at their upper ends and work freely through the cut-off device b^{20} b^{21} b^{22} at their lower ends. This cut-off device is located in a suitable seat b^{23} , cut in the chute-body a , for movement transversely of the nail-slots a' . The part b^{20} is in the form of a yoke, overreaching the nail-chute, and the parts b^{21} are in the form of hooks turned inward and at a slight upward angle from the outer ends of the part b^{20} . The part b^{22} is carried from the part b^{20} by arm b^{24} and is of a length equal to the space between the nail-slots a' , and is carried from the lower side of the part b^{20} .

c is a handle for manipulating the machine, which turns freely on the threaded bolt c' , and may be secured in any desired position thereon, with a clamping action, by the thumb-nut c^2 . Hence the handle c may be set at any angle to the nail-chute body, or be turned from one to the other side of the same, as may be found most convenient for handling the machine, or for adapting the same to be used by a right or left-handed operator.

Having regard to the action or operation of the device, the nails d are put into the magazine a^{12} . Sufficient nails are put in to fill the magazine. The slots a' are of a width to admit the points and bodies, but not the heads of the nails. Hence the nails will drop into the said slots point downward, and under the action of gravity will work or slide to the lower end of the same, or as far as permitted by the columns of nails already in the slots. Suppose the parts to be in the position shown in Figs. 3 and 5. Then the column of nails d in the front slot will be held by the part b^{22} of the cut-off device, and the column of nails

in the rear slot will be held by one of the parts b^{21} of the cut-off device. If now a stroke from the mallet or hammer be given to the plunger-head b^4 , or the same be otherwise forced downward, the cam-lever b^5 will impart a quarter-turn to the shaft b^8 and the cam b^{18} , turning the same in the direction indicated by the arrows; but, as the cut-off device was already in its extreme front position, the cam will have no further effect thereon in the downstroke of the plunger. When the plunger is returned upward, however, by the spring b' , the said shaft b^8 and cam b^{18} will receive another quarter-turn, thereby bringing the low part of the cam b^{18} opposite to the front rod b^{19} and the high part of said cam into action on the rear rod b^{19} , thereby shifting the cut-off device to its rearmost position and permitting the lowermost nail in the front slot to escape from the cut-off device and fall into the passage a and outlet-funnel a^3 , and at the same time, by the same movement, the front hook b^{21} will intercept and hold the column of nails in the front slot, and the part b^{22} will come into effect to hold the column of nails in the rear slot at the same time that the said column in said rear slot is released from the rear hook b^{21} . On the next upstroke of the plunger the cut-off device will move forward or in the opposite direction, and a nail will be released from the rear nail-slot and will drop into the rear passage a^2 and thence into the outlet-funnel a^3 . Otherwise stated, the downstroke of the plunger produces a non-active or idle movement of the cam-shaft b^8 , and the upstroke of the plunger produces an active or releasing action on the cam-shaft, and the releases are effected alternately from the two nail-slots on the succeeding upstrokes of the plunger. The advantage of the double nail-slot and the consequent double action is that a larger quantity of nails are rendered available and more time is afforded for the same to assume their proper positions in the nail-slot and the other co-operating passages. The driving action is probably obvious from an inspection of Fig. 2 of the drawings. The nail having once entered the funnel a^3 will be held in an upright position with the point and body of the same extended into the passage a^{11} , formed by half-grooves in the parts a^4 and a^5 , and the head of the nail will be under the lower end of the plunger with the axis of the nail slightly eccentric to the axis of the plunger. Hence, under the stroke of the mallet, the plunger will strike the head of the nail, the spring-held clamping-piece a^5 will yield to permit the outward passage of the nail, and the sloping surface of the fixed part a^4 will force the nail laterally, so as to center its axis with the axis of the plunger, just as the nail is about to enter the wood. The plunger is centered and guided by the parts a , b^5 and b^8 .

The modification shown in Figs. 12 and 13 is similar in its action, but employs only a single nail-slot f , arranged central of the

chute-body f' , a corresponding single vertical passage f^2 , leading to the outlet-funnel, and a single-action cut-off $f^3 f^4$, and a single-action cam f^5 on a rocking cam-shaft f^6 .
 5 Hence the cam-shaft only requires a single cam-channel f^7 , in which the tongue b^7 of the cam-lever b^5 works, to impart to the said shaft the rocking motion. A single spring-rod f^8 is employed, which in its outward movement
 10 by the cam f^5 is limited by a fixed stud f^9 , so as to set the same under tension, to return to its normal position by its spring action. The lower end of the rod f^8 is fixed to the cut-off device f^3 , or otherwise secured there-
 15 to, so as to make the cut-off device move with the rod in each direction. Hence with this device the hooks f^4 will alternately intercept and hold the columns of nails in the slot f and permit the release of the lowermost nail when-
 20 ever the cut-off device shifts from its rear-most to its foremost position, which is on each upstroke of the plunger. This form of the nailer has the merit of extreme simplicity and cheapness of construction.
 25 By actual usage I have demonstrated the practical character and efficiency of this machine.

What I claim; and desire to secure by Letters Patent of the United States, is as follows:

1. In a nailer, the combination with the 30 single hammer, of the double nail chute delivering thereto, and the double cut-off device, comprising the escapement, b^{20} , b^{21} , b^{22} , b^{24} , the pair of rods b^{19} , and the cam b^{18} , actuated from said hammer, and engageable al- 35 ternately with said rods b^{19} , substantially as and for the purposes set forth.

2. In a nailer, the combination with the nail-chute a , and the discharge head $a^4 a^5$, of the nail-slots and passages $a' a^2 a^3$, the cut- 40 off device $b^{20} b^{21} b^{22}$, the rods b^{19} , the cam b^{18} , the shaft b^8 , having the cam-channels $b^{10} b^{11} b^{12} b^{13} b^{14} b^{15}$, the spring-seated plunger b and the cam-lever b^5 , carried by the plunger sleeve- 45 ing at its outer end on said shaft b^8 and provided with the tongue b^7 , working in the cam-channels of said shaft, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD H. REUSSE.

Witnesses:

HENRY P. A. MARTYN,
 J. B. MARTYN.