No. 647,697. Patented Apr. 17, 1900.

C. W. CONNER.

ROOFING TOOL.

(No Model.) (Application filed Feb. 9, 1900.)

2 Sheets—Sheet 1.

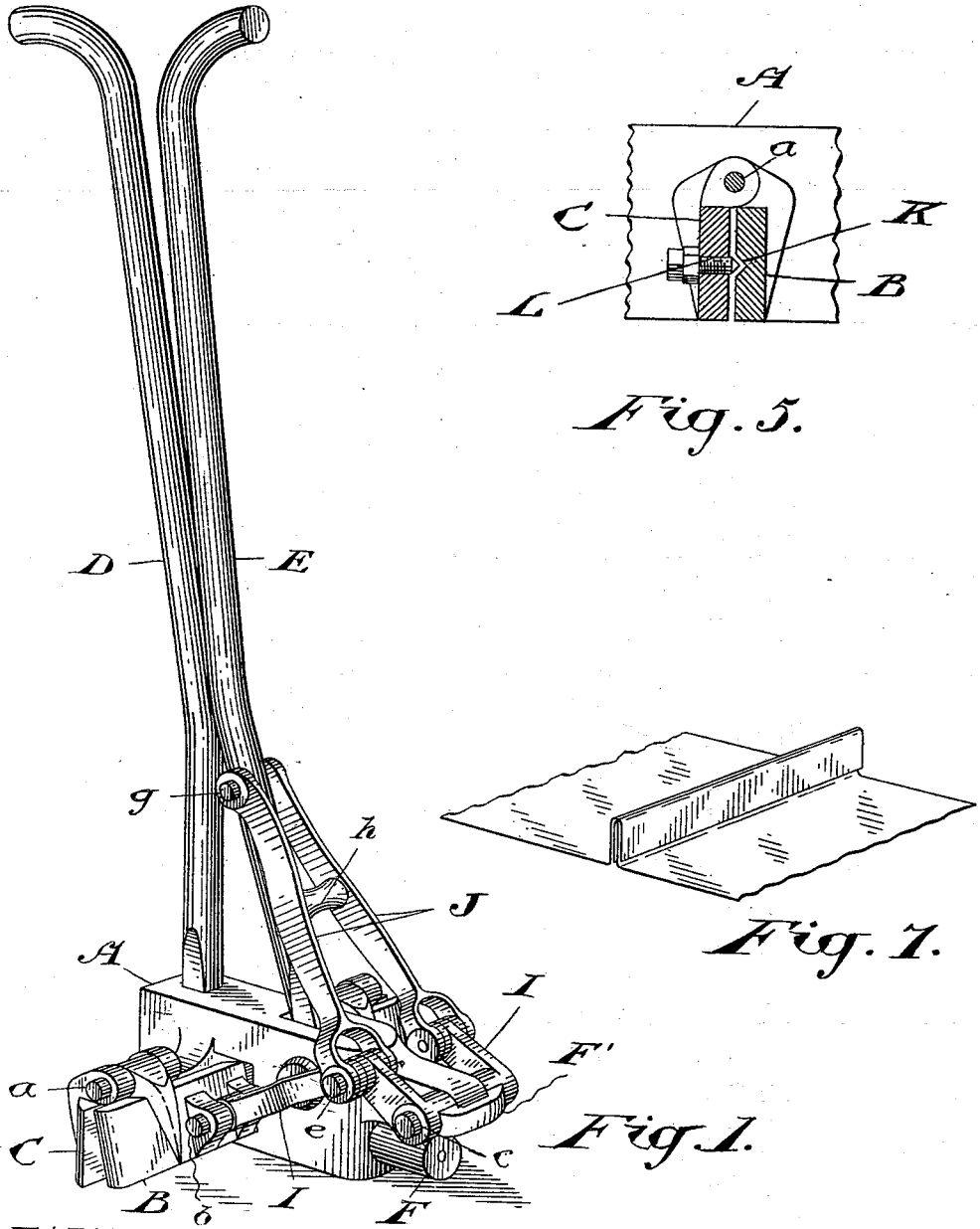

Fig. 1.

Fig. 5.

Fig. 7.

Witnesses

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2 Sheets—Sheet 2

Fig. 2.

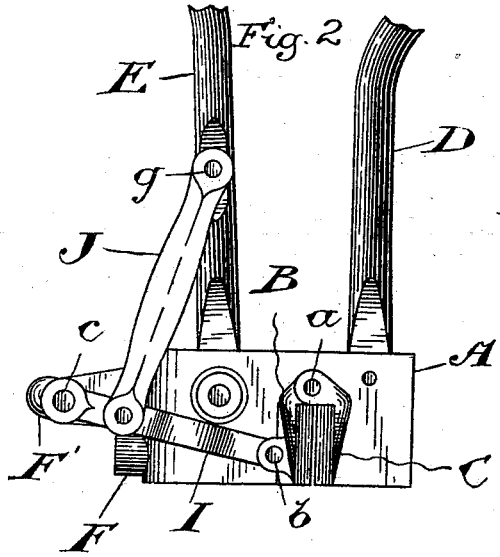
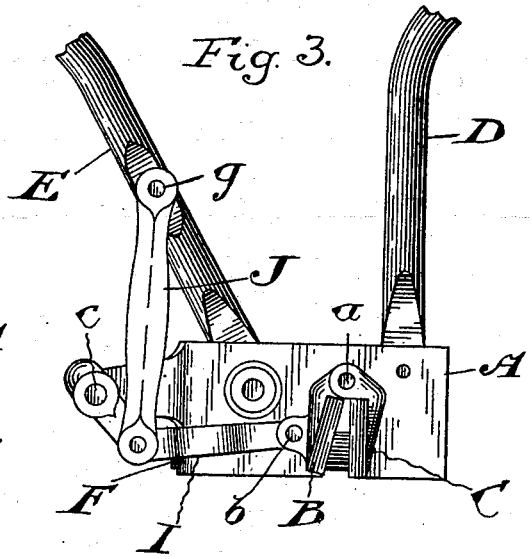


Fig. 3.



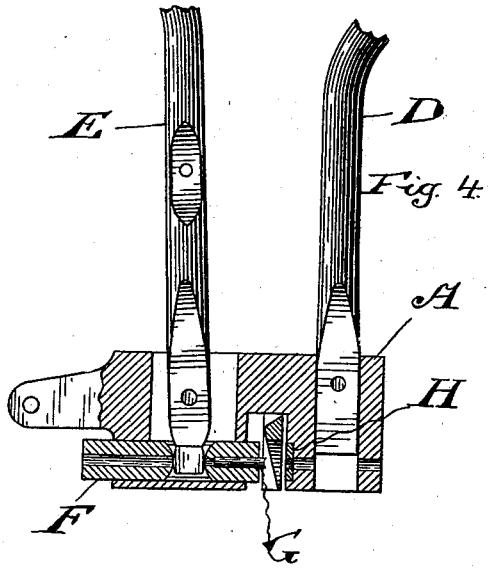
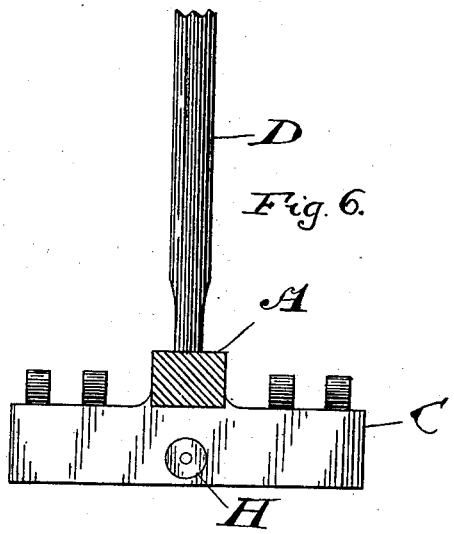


Fig. 4.

Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

CARLTON W. CONNER, OF TORONTO, CANADA.

ROOFING-TOOL.

SPECIFICATION forming part of Letters Patent No. 647,697, dated April 17, 1900.

Application filed February 9, 1900. Serial No. 4,627. (No model.)

To all whom it may concern:

Be it known that I, CARLTON WESCOTT CONNER, die-maker, of the city of Toronto, in the county of York, Province of Ontario, Canada, have invented certain new and useful improvements in Roofing-Tools, of which the following is a specification.

The object of my invention is to devise a tool which will quickly and easily squeeze and punch the standing seams of what is known as "cap-roofing" and which will keep in good repair a much longer time than the tools now in use; and it consists, essentially, of a head slotted to fit over a seam, one side of the slot being formed of a movable leaf to coact with the stationary side of the slot to squeeze the seam, a longitudinally-movable punch and an opposed die, suitable handles, and means for operating the movable leaf and die, substantially as hereinafter more specifically described and then definitely claimed.

Figure 1 is a perspective view of the tool with the movable leaf open and the punch withdrawn. Fig. 2 is a side elevation showing the tool with the movable leaf closed. Fig. 3 is a similar view showing the movable leaf open and the punch coacting with the die. Fig. 4 is a longitudinally-vertical section through the head of the tool. Fig. 5 is a detail showing a countersink. Fig. 6 is a cross-section of the head. Fig. 7 is a perspective view of a portion of the seam upon which the tool is intended to operate.

In the drawings like letters of reference indicate corresponding parts in the different figures.

A is the head of the tool, which is transversely slotted, one side of the slot being formed by the movable leaf B. The other side of the slot is formed by the stationary leaf C. These leaves preferably extend out each side from the head, so as to give the latter a cruciform appearance in plan. This configuration is that best adapted for the tool. The leaves forming the slot must be long to operate upon a suitable length of seam, while suitable extensions of the head on each side of the slot are necessary for the connection of the handles and the support of the punch and die hereinafter described.

Although the leaf B may be made movable in any suitable manner, I prefer to hinge it to the upper side of the stationary leaf C, as shown at *a*.

Secured to the head, at one side, is the stationary handle D. Pivoted within a slot formed within the other side of the head is the handle E. The lower end of this pivoted handle is adapted to engage a slot formed in the plunger F, which is longitudinally movable in a suitable hole formed in the head. This plunger carries a punch G. At the opposite side of the slot in the head is located the opposed die H, with which the punch coacts when punching the metal of the seam.

I represents toggle-joint levers, each of which is pivoted to the movable leaf, as shown at *b*, and to the head, as shown at *c*.

e represents the pivots connecting the parts of the toggle-joint levers.

It will be noted that the outer parts of the toggle-joint levers are connected by the saddle F′ to aid in causing the operation of both toggle-joint levers to be practically simultaneous.

J represents links pivoted upon the handle E at *g* and also pivotally connected with the toggle-joint levers, preferably by the same pivots *e* which connect the parts of the levers. These links J, it will be noted, are connected by the cross-brace *h*, so as to insure as far as possible that they will convey the motion of the handle to the toggle-joint levers as evenly as possible, it being advisable that pressure should be applied evenly to the movable leaf at the opposite sides of the head.

In Fig. 7 is illustrated the seam upon which the tool is to work. As seen, the parts of the metal forming the seam are not squeezed tightly in contact with one another. It is the function of the tool to squeeze these parts tight in contact with one another and also at given points to punch the seam to form a hole for the rivet.

The operation of the tool is substantially as follows: The tool is placed in position with the slot therein embracing the seam, the parts of the tool being in the position indicated in Fig. 1. By moving the pivoted handle until the three pivot-points of each toggle-joint lever are in line the movable leaf will be closed and the seam properly squeezed. It will be noticed on reference to Fig. 2 that the movable leaf is so hinged that when it is closed

there is sufficient space between the two leaves to accommodate the actual thickness of metal of the seam when squeezed tight. The pivoted handle is now returned to its normal position and the tool shifted to squeeze a fresh portion of the seam. As soon as a point is arrived at where a rivet is to be inserted, after the handle has been moved sufficiently far to bring the pivots of the toggle-joint levers in line and so squeeze the seam the motion of the handle is continued. The movable leaf now opens up and the punch comes forward sufficiently far to coact with the die and punch the seam. (See Fig. 3.) Upon moving the handle toward its normal position it will be seen that the punch will be withdrawn and at the same time the movable leaf closed, so as to automatically strip the metal of the seam from the punch. This motion is important, as unless some part thus comes forward to strip the punch the latter tends to stick in the hole and drag the seam back with it as it is withdrawn, which would be ultimately sure to damage the punch and have a tendency to open up and spoil the seam. As the handle is drawn completely back to its normal position the movable leaf again opens and the tool is ready to squeeze a fresh section of the seam.

It will be seen that any length of seam may be squeezed without punching, as in the action of squeezing the lever is only moved sufficiently far to bring the pivot-points of the toggle-joint levers in line. The operator can without looking tell when this occurs by feel through the metal of the movable handle and will at once return the movable handle to its normal position. Only when he desires to punch a rivet-hole will he move the handle past the squeezing-point. This tool thus combines in one a squeezer and a punch and will perform both these operations much more effectively than the ordinary tools used for the purpose. The tool will also be found to be very durable and will accomplish a large amount of work before the punch requires replacing or repairing, as the punch moves parallel with its axis and must always keep in line with its die.

As for some classes of roofing riveting is not essential, I may provide one of the leaves with a die K, as shown in Fig. 5, and the other with a countersink L. This countersink is preferably screwed through the leaf and secured in position by a jam-nut, as shown. When it is desired to countersink, the countersink L can be screwed forward into position, when the metal of the seam will be suitably countersunk so that the parts will engage one another. The countersinks may be arranged one at one end on the movable leaf and the other at the other end upon the stationary leaf, so as to countersink alternately from opposite sides, thus making it impossible for the seams to tear apart. The power in squeezing given by the toggle-joint motion enables the operator to squeeze a seam perfectly tight, and it will be noticed that the greatest leverage is obtained at the last moment of squeezing, when the greatest power is required to squeeze the seam absolutely tight, and it is unnecessary to state that a tight seam is most important in securing a water-tight roofing. Ribbing might also be accomplished in the same manner.

What I claim as my invention is—

1. A roofing-tool comprising a transversely-slotted head provided with extensions, one of which is movable, and a handle secured thereto in combination with a die located at one side of the slot, an opposed punch secured to a plunger longitudinally movable in the head on the opposite side of the slot; and a handle adapted to reciprocate the said plunger and said movable extension, substantially as and for the purpose specified.

2. A roofing-tool comprising a transversely-slotted head provided at each side of the slot with extensions giving the head the shape of a cross; and a handle secured to one of the extensions in combination with a punch secured to a plunger longitudinally movable in the opposite extension of the head; an opposed die located in the head at the opposite side of the slot; and a handle adapted to reciprocate the said plunger, substantially as and for the purpose specified.

3. A roofing-tool comprising a transversely-slotted head; a movable leaf forming one side of the slot; and a handle secured to the said head in combination with a plunger longitudinally movable in the head at one side of the slot; a punch carried by the said plunger; an opposed die located in the head at the other side of the slot; a handle pivoted on the head; and means whereby the rocking of the handle closes the movable leaf and causes the punch to coact with the die, substantially as and for the purpose specified.

4. A roofing-tool comprising a transversely-slotted head; a suitably-arranged movable leaf forming one side of the slot; and a handle secured to the said head in combination with a plunger longitudinally movable in the head at one side of the slot; a punch carried by the said plunger; an opposed die located in the head at the other side of the slot; a handle pivoted on the head; and means whereby the rocking of the handle first closes the movable leaf and afterward causes the punch to coact with the die, substantially as and for the purpose specified.

5. A roofing-tool comprising a transversely-slotted head; a suitably-arranged movable leaf forming one side of the slot; and a handle secured to the said head in combination with a plunger longitudinally movable in the head at one side of the slot; a punch carried by the said plunger; an opposed die located in the head at the other side of the slot; a handle pivoted on the head; and means whereby the rocking of the handle in one direction first closes the movable leaf and then causes the punch to coact with the die, while the return motion of the handle first withdraws the

punch and closes the leaf to strip the punch and finally opens the leaf again, substantially as and for the purpose specified.

6. A roofing-tool comprising a head; a stationary leaf formed thereon; and a suitably-arranged movable leaf forming with the stationary leaf a slot for the reception of a seam in combination with a handle secured to the head; a handle pivoted on the head and means whereby the movement of the pivoted handle may be caused to close and open the said movable leaf, substantially as and for the purpose specified.

7. A roofing-tool comprising a head; a stationary leaf formed thereon; and a suitably-arranged movable leaf forming with the stationary leaf a slot for the reception of a seam in combination with a handle secured to the head; a handle pivoted on the head; a toggle-joint lever pivoted at one end upon the head and at the other upon the movable leaf; and a link pivotally connecting the pivoted handle and the toggle-joint lever, substantially as and for the purpose specified.

8. A roofing-tool comprising a head; a stationary leaf formed thereon; a movable leaf suitably hinged contiguous to the said stationary leaf in combination with a handle secured to the head; a handle pivoted on the head; a toggle-joint lever pivoted at one end upon the head and at the other upon the movable leaf; and a link pivotally connecting the pivoted handle and the toggle-joint lever, substantially as and for the purpose specified.

9. A roofing-tool comprising a transversely-slotted head; a suitable-arranged movable leaf forming one side of the slot; and a handle secured to the said head in combination with a slotted plunger longitudinally movable in the head at one side of the slot; a punch carried by the said plunger; an opposed die located in the head at the other side of the said slot; a handle pivoted on the head and having its end below the pivot engaged with the slot in the plunger; a toggle-joint lever pivoted at one end upon the head and at the other upon the movable leaf so that when the three pivots of the toggle-joint lever are in line the movable leaf is closed; and a link pivotally connected to the pivoted handle and the toggle-joint lever, the parts being so proportioned that when the pivoted handle is moved the punch will not coact with the die till after the movable leaf is closed, substantially as and for the purpose specified.

10. A roofing-tool comprising a head; a stationary leaf formed thereon; and a suitably-arranged movable leaf forming with the stationary leaf a slot for the reception of a seam in combination with a handle secured to the head; a handle pivoted on the head; a toggle-joint lever pivoted at one end upon the head and at the other upon the movable leaf so that when the three pivots of the toggle-joint lever are in line the movable leaf is closed; and a link pivotally connecting the pivoted handle and the toggle-joint lever, substantially as and for the purpose specified.

11. A roofing-tool comprising a head; a stationary leaf formed thereon; and a suitably-arranged movable leaf forming with the stationary leaf a slot for the reception of a seam in combination with a handle secured to the head; a handle pivoted on the head; a toggle-joint lever pivoted at one end upon the head and at the other upon the movable leaf; and a link pivotally connecting the pivoted handle and the toggle-joint lever; a countersink adjustably connected to one of the leaves and arranged so that it may be placed in position to coact with a die formed in the opposite leaf, substantially as and for the purpose specified.

Toronto, Canada, January 31, 1900.

CARLTON W. CONNER.

In presence of—
A. J. COLBOURNE,
J. M. WEBSTER.