

A. E. CONVERS.
HEADER FOR NAIL MACHINES.
APPLICATION FILED MAR. 23, 1911.

1,033,231.

Patented July 23, 1912.

3 SHEETS-SHEET 1.

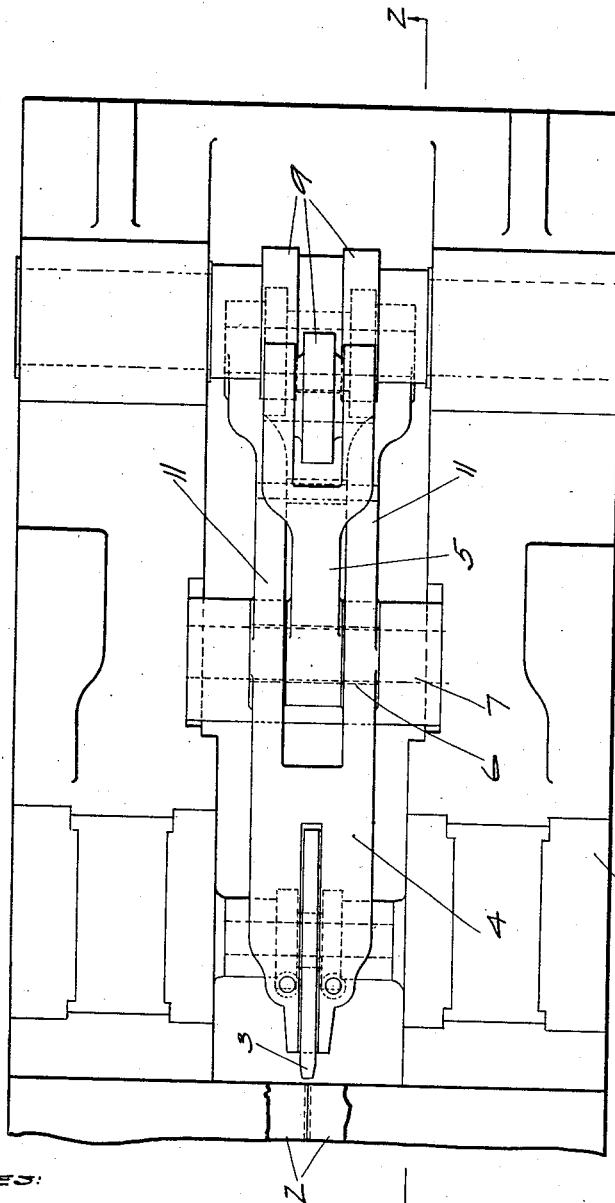


FIG. 1.

WITNESSES:

J. F. O'Brien
Jno. F. O'Brien

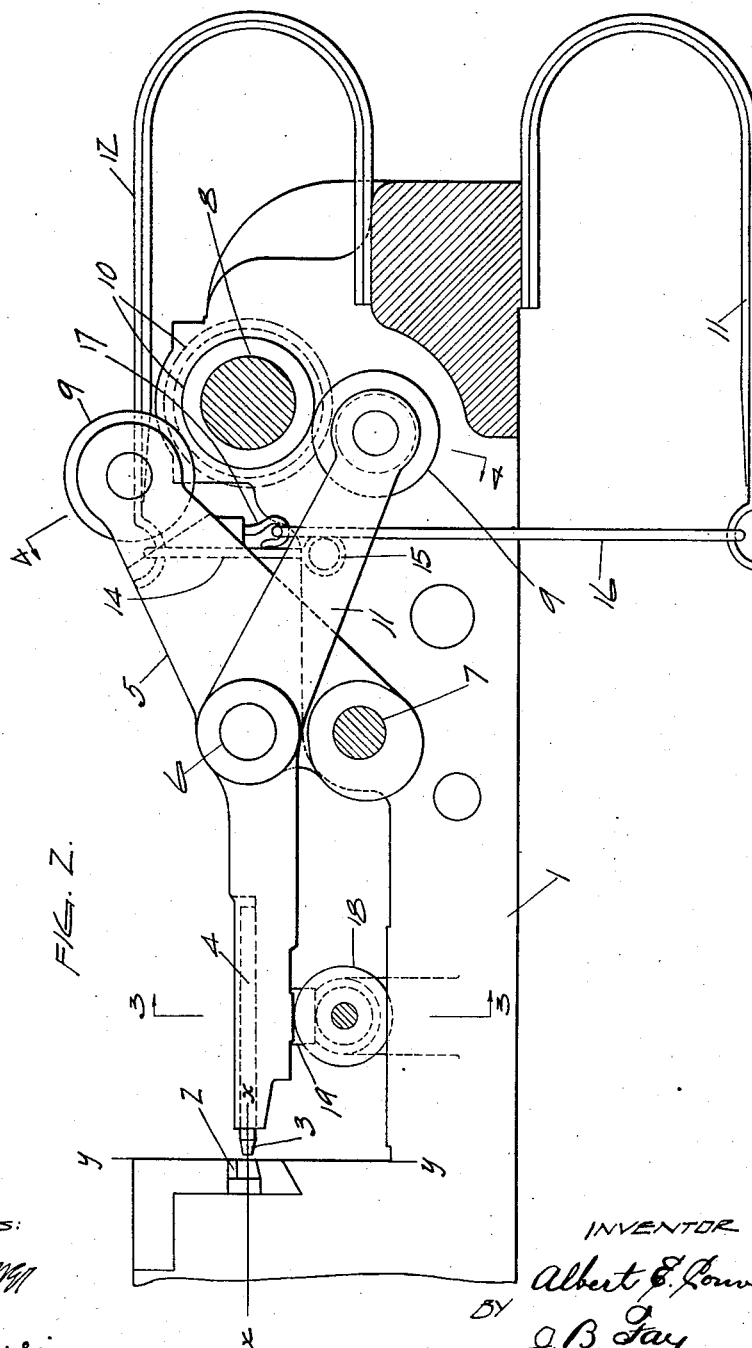
Albert E. Convers
INVENTOR
J. B. Fay
ATTORNEY

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WITNESSES:
[Signature]
 Jno. F. Oberlin

INVENTOR
 Albert E. Convers
 BY *[Signature]*
 J. B. Fay
 ATTORNEY

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3 SHEETS-SHEET 3.

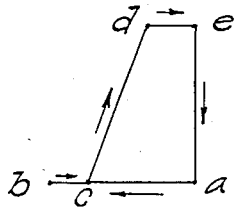
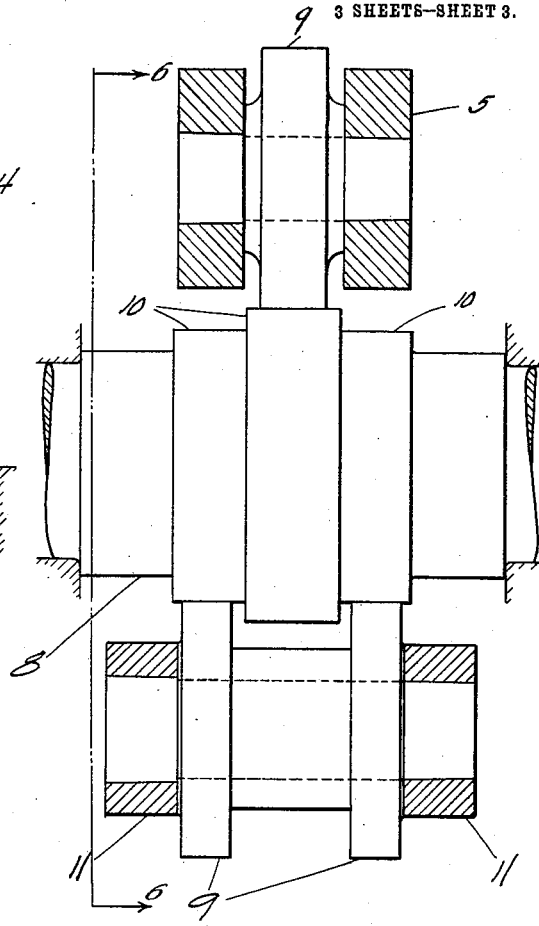
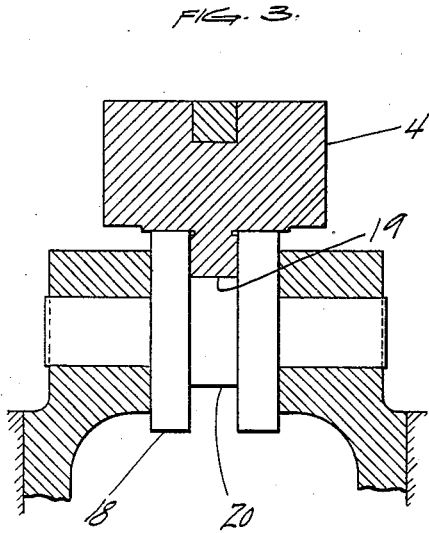


FIG. 5

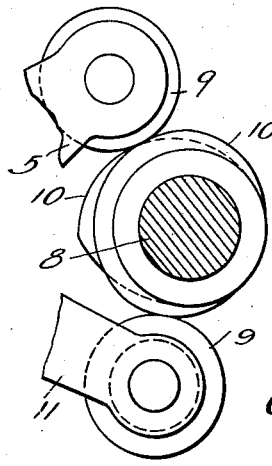


FIG. 6.

WITNESSES
[Signature]
 Jno. F. O'Brien

INVENTOR
 Albert E. Convers
 BY
[Signature]
 J. B. Fay
 ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT E. CONVERS, OF CLEVELAND, OHIO.

HEADER FOR NAIL-MACHINES.

1,033,231.

Specification of Letters Patent.

Patented July 23, 1912.

Application filed March 23, 1911. Serial No. 616,346.

To all whom it may concern:

Be it known that I, ALBERT E. CONVERS, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Headers for Nail-Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

While the present invention relates, as just indicated, to nail machines and the like, the characteristic features thereof are equally susceptible of use in connection with any type of heading or upsetting machine, whether the article being manufactured is a nail, spike, bolt, or what not.

Such invention concerns more particularly the construction and mode of operation of the heading mechanism of machines of this general class, one object being to provide an actuating mechanism for the header, whatever the form or size of the latter, that will accomplish the desired upsetting operation with a minimum amount of movement. Heretofore such header has generally been actuated through the agency of a crank shaft and hence, irrespective of the amount of movement actually required, a certain throw at least as great as the maximum movement and generally greater has been provided.

A further object is the provision of mechanism, that while strong and effective in operation, will nevertheless be extremely simple and little likely to get out of order under continuous use, such as is desirable, if any high degree of economy is to be attained in the operation of machines of this class. It will be understood, of course, that by cutting out all unnecessary movement of the header, the speed of the machine may be very considerably increased, since the mechanism already in use for feeding and gripping the stock may be speeded up far beyond the capacity of any prevailing type of heading mechanism.

To the accomplishment of the foregoing and related ends, said invention, then, con-

sists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a broken plan view of a nail machine showing the present improved header mechanism; Fig. 2 is partially a side elevation and partially a vertical section of such a machine on the line 2—2, Fig. 1; Fig. 3 is a transverse section on the line 3—3, Fig. 2; Fig. 4 is a transverse section on the line 4—4, Fig. 2; Fig. 5 is a diagrammatic representation, four times enlarged, of the actual path of header travel in a machine adapted for heading eight-penny nails and Fig. 6 is a section on the line 6—6 in Fig. 4.

Only so much of the general frame work or bed 1 of the machine, as is essential to a showing of the mechanism now to be described, is involved in the several figures of the foregoing drawings; and similarly the accessory parts of the machine, including the driving mechanism and the stock feeding and gripping mechanism have been largely omitted from such illustration, as forming no part of the present invention. The stock likewise not shown, but consisting of a wire rod, or bar as the case may be, is designed to be intermittently fed forwardly on the line $x-x$ Fig. 2, being securely gripped at the end of each advance movement with a sufficient portion projecting beyond the line $y-y$, which marks the inner face of the gripping dies 2, to provide the material for the head. The header or die 3, whereby such head is formed, is carried by a supporting member or carrier 4, that constitutes part of the present combination. First noting said tool, however, it may be remarked that it is interchangeably mounted on said supporting member and may take on any desired form so as to correspondingly upset and shape the head out of such projecting portion of the stock. The member

4, which is thus seen to carry the heading tool, is itself carried by a second member 5, being pivotally attached thereto by a pin 6, so as to oscillate freely in a vertical plane. Said second member is in turn pivotally mounted on the machine frame 1 about an axis 7 parallel with said pin, so as to also have an oscillatory movement in a vertical plane. The movement of the forward end of the header supporting member, and thus of the header itself, will accordingly be compounded of the oscillatory movement of said member and that of the second member 5 whereby it is in turn carried. Movement of said second member and of said first member, so far as movement of the latter is independent of that of the second, is derived from drive shaft 8 that is driven in any suitable fashion, as need not be explained. This shaft, it should be explained, has been omitted from the showing in Fig. 1, in order not to conceal certain details located beneath the same. The rear ends of said members 4 and 5 are respectively extended below and above said shaft and carry rollers 9, that are adapted to bear against corresponding cams 10 mounted on said shaft. In order that operative strains may be properly distributed, the first member 4 is bifurcated at its rear end, but it is not necessarily so, the respective arms 11, lying on either side of the second member 5, as clearly shown in Fig. 1.

The form and angular location of the cams 10 on the shaft 8 which bear against the rollers 9 carried by the rear ends of the two members 4 and 5 will obviously vary, depending upon the amount and character of movement which it is desired to impart to the heading tool; accordingly in Fig. 2, merely the throw of said cams is indicated by the dotted circles the first, or header-carrying, member being represented in this same figure, as in its central position of travel.

The rear ends of the two members 4 and 5 or rather the rollers 9, which are carried by said ends, are maintained in close contact with their corresponding cams 10 on the shaft 8 by means of suitable springs 12 and 13 illustrated in Fig. 2 as leaf springs, the first of which is recurved upwardly and forwardly and has its forward end connected by a link 14 with a stay 15 that connects the two arms of the bifurcated rear end of the first member; the second of which is recurved downwardly and forwardly and is similarly connected by means of a link 16 with a hook 17 on the under side of the rear end of the second member. The form and disposition of these springs, however, is obviously merely a matter of design. The forward end of the member 4 which carries the heading tool, is moreover supported, or rather guided, in a grooved guide-roller 18,

shown in detail in Fig. 3, the under side of said member being provided with a projection or rib 19 conforming with the groove 20 in said roller. It has already been explained that the movement of such forward end of the first member, and of the heading tool carried thereby, is a compound one, and for the purpose of illustration, a typical movement has been selected and plotted in Fig. 5. The graph which constitutes such figure represents the center line of header travel enlarged four times from the dimensions of such travel in the case of a machine designed for heading eight-penny nails. The forward movement, which performs the actual upsetting operation, is along the base line in the figure from point *a* to point *b*; thereupon the header is retracted to the point *c*, just far enough to clear the head formed on the stock; then said header is raised and at the same time further retracted along the line *c-d*, being finally moved along the line *d-e* to a point directly over its initial, or starting, position. Thereupon it is dropped along the line *e-a* to such starting position. When the magnification of the movement represented in Fig. 5, as just described, is taken into consideration, it will be appreciated how very slight such movements are. Not only is it possible, on this account, to perform the complete cycle of movements much more rapidly than heretofore, but, the full force of the advance being concentrated into a short movement, as much power as may be required for any upsetting operation is always available. Owing to this same reduction in the length of the movements of the several parts, the wear on the bearings is minimized and friction losses correspondingly reduced, and I have accordingly found a very marked economy is obtainable in actual use of machines constructed in accordance with the foregoing specifications.

An additional advantage gained by the present invention may finally be noted. In the prevailing type of nail machines, it is necessary to have mechanism for ejecting the nail as formed. In the present machine, however, the stock is fed forward below the header 3 when it is in its upper retracting position, and as the header descends, as may be seen in Fig. 5, it gently knocks the formed nail down into a receptacle which may be provided to receive the nails. The necessity for the usual "clearer" or "kicker" with its well recognized disadvantages is therefore entirely obviated.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention.

1. In mechanism of the character described, the combination of an oscillatory member; a header-carrier supported thereby so as to be reciprocated by oscillation of said member; means for positively oscillating said member; and means for positively moving said header-carrier independently of its reciprocation and transversely of its direction of reciprocation.

2. In mechanism of the character described, the combination of an oscillatory member pivoted on an axis substantially at its end; a header-carrier supported by said oscillatory member beyond the latter's pivoted end; means for positively oscillating said member on its axis; and means for positively moving said header-carrier independently of its reciprocation with said member and transversely of its direction of reciprocation.

3. In mechanism of the character described, the combination of a member oscillatory on a horizontal axis; a header-carrier secured thereto on a horizontal pivotal axis so as to be reciprocated by oscillation of said member; means for positively oscillating said member on its axis; and means for positively rocking said header-carrier on its pivotal axis independently of its reciprocation.

4. In mechanism of the character described, the combination of an oscillatory member pivoted substantially at one end on a horizontal axis; a header-carrier secured to said member on a horizontal pivotal axis beyond the pivotal axis of said member; means for positively oscillating said member on its axis; and means for positively rocking said header-carrier on its pivotal axis independently of its reciprocation with said member.

5. In mechanism of the character described, the combination of an oscillatory member pivoted substantially at one end on a horizontal axis; a header-carrier secured between its ends to said member beyond the pivotal axis of said member; means for positively oscillating said member on its axis; and means for positively moving said header-carrier in a vertical plane independently of its reciprocation with said member.

6. In mechanism of the character described, the combination of an oscillatory member pivoted substantially at one end on a horizontal axis; a header-carrier secured between its ends to said member on a horizontal pivotal axis between the ends of said member; means for positively oscillating said member on its axis; and means for positively rocking said header-carrier on its axis independently of its reciprocation with said member.

7. In mechanism of the character de-

scribed, the combination of an oscillatory member; another member pivotally supported intermediately between its ends upon said oscillatory member, said other member being adapted to carry a header at one end and having its other end extend in the same general direction as said oscillatory member; and rotatable cams located between said similarly extending member-ends and coöperative therewith to independently oscillate said members about their respective axes.

8. In mechanism of the character described, the combination of an oscillatory member; another member pivotally supported intermediately between its ends upon said oscillatory member, said other member being adapted to carry a header at one end and having its other end extend in the same general direction as said oscillatory member; a drive shaft transversely disposed between said similarly extending member-ends; and cams borne by said shaft and coöperative with said ends to independently oscillate said members about their respective axes.

9. In mechanism of the character described, the combination of an oscillatory member; another member pivotally supported intermediately between its ends upon said oscillatory member, said other member being adapted to carry a header at one end and having its other end extend in the same general direction as said oscillatory member; a drive shaft transversely disposed between said similarly extending member-ends; cams carried by said shaft and adapted to coöperate with said ends to independently oscillate said members about their respective axes; and resilient means for retaining said member-ends in contact with said cams.

10. In mechanism of the character described, the combination of an oscillatory member pivoted substantially at one end on a horizontal axis; a carrier pivoted between its ends to said oscillatory member on a horizontal axis between the ends of said member, one end of said carrier being adapted to receive a header and the other end thereof extending in the same general direction as the free end of said member; and means disposed between the similarly extending ends of said member and carrier adapted to independently oscillate said member and carrier on their respective axes.

11. In mechanism of the character described, the combination of an oscillatory member pivoted substantially at one end on a horizontal axis; a carrier pivoted between its ends to said oscillatory member on a horizontal axis between the ends of said member, one end of said carrier being adapted to receive a header and the other end thereof extending in the same general

direction as the free end of said member; a
rotatable shaft disposed between the simi-
larly extending ends of said member and
carrier; and cams borne by said shaft and
5 coöperative with such ends of the member
and carrier to independently oscillate the
member and carrier on their respective axes.

Signed by me this 21st day of March,
1911.

ALBERT E. CONVERS.

Attested by—

ROBERT M. SEE,
D. T. DAVIES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
