

C. S. BODEN.
 AUTOMATIC HAMMER.
 APPLICATION FILED JUNE 17, 1913.

1,162,678.

Patented Nov. 30, 1915.

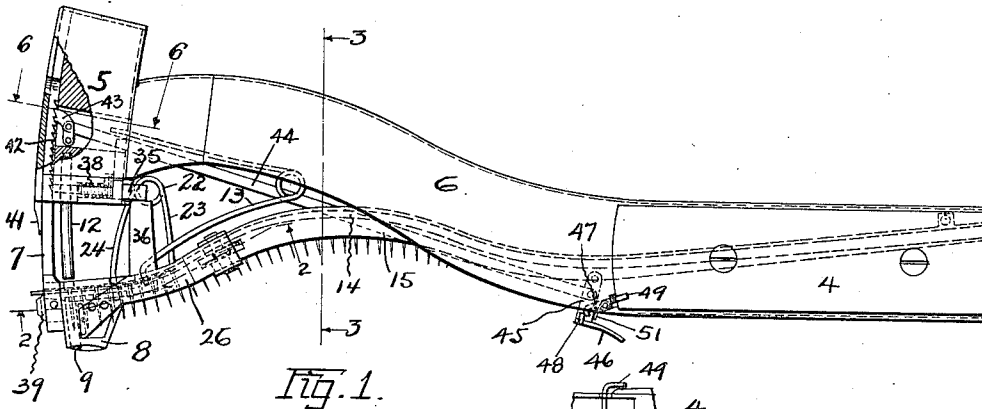


Fig. 1.

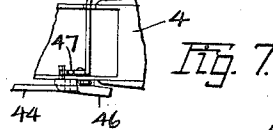


Fig. 7.

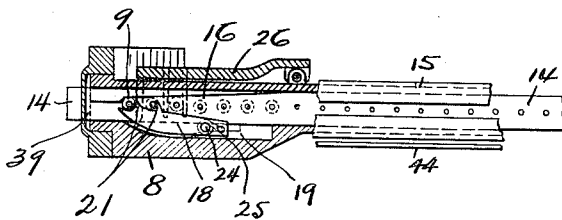


Fig. 2.

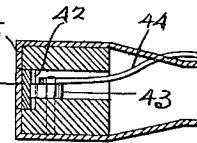


Fig. 6.

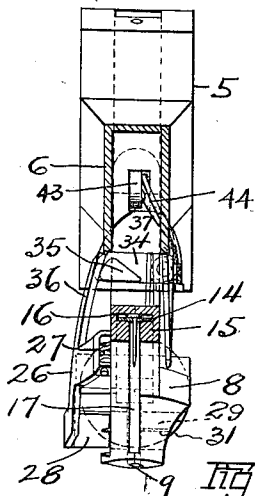


Fig. 3.

WITNESSES:

H. J. Frost.
R. S. Pidwell

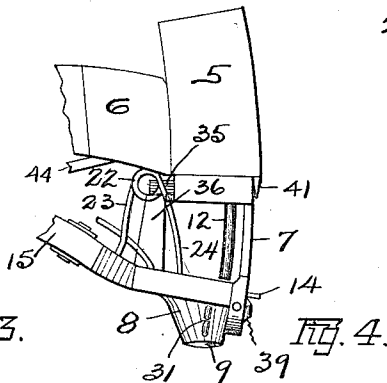


Fig. 4.

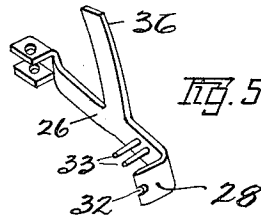


Fig. 5.

INVENTOR.
 C. S. BODEN
 BY *Miller & White*
 ATTORNEYS.

UNITED STATES PATENT OFFICE.

CLARENCE S. BODEN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO BODEN'S
AUTOMATIC HAMMER CO., A CORPORATION OF CALIFORNIA.

AUTOMATIC HAMMER.

1,162,678.

Specification of Letters Patent.

Patented Nov. 30, 1915.

Application filed June 17, 1913. Serial No. 774,094.

To all whom it may concern:

Be it known that I, CLARENCE S. BODEN, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Automatic Hammers, of which the following is a specification.

The invention relates to hand tools and particularly to hand tools for supplying and driving tacks, nails or other fastenings one at a time.

The object of the invention is to provide a simple and efficient automatic swing hammer.

Another object of the invention is to provide an improved means of feeding the tacks or nails to be driven.

A further object of the invention is to provide an automatic swing hammer in which the direction of the blow is always aligned with the nail or tack being driven.

The invention possesses other advantageous features, which, with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. The novelty of the invention will be included in the claims succeeding said description. From this it will be apparent that I do not limit myself to the showing made by such drawings and description, as I may adopt many variations within the scope of my invention as set forth in said claims.

Referring to said drawings: Figure 1 is a side elevation of one form of the hammer of my invention. Fig. 2 is a section on a larger scale taken on the line 2—2 Fig. 1. Fig. 3 is a section taken on the line 3—3 Fig. 1. Fig. 4 is an elevation of the opposite side of the head of the hammer from that shown in Fig. 1. Fig. 5 is a perspective view of the tack locking means removed from the hammer. Fig. 6 is a cross sectional detail of the head taken on the line 6—6 Fig. 1. Fig. 7 is an under view of a fragment of the handle showing the lock operating means.

It is to be understood that I do not limit myself to the use of particular styles or shapes of tacks, nails, or other fastenings, since such will be suited to the particular use

to which the tool is to be applied, and the tool will be constructed to operate on the particular fastening to be used. In the present instance, the tool shown is designed to operate on short nails, and for the purposes of description the fastenings will be hereinafter referred to as nails.

The hammer comprises a hollow handle 4 which is rigidly connected to the head 5 by the neck 6 which may be either straight and aligned with the handle, or which may be curved as shown. The head 5 may be of any desirable shape and is formed of sufficient weight so that the impact of the blow is sufficient to drive the nail into the desired material. The neck 6 is preferably formed hollow and open on the under side as shown in Fig. 3. Slidably attached to the head 5 by means of the tongue 7 and capable of limited movement with respect to the head is a stripper 8 having an aperture 9 extending therethrough. Fixed in the head 5 and aligned with the aperture 9 in the stripper is the driver 12 which operates to drive the nail through the aperture and into the desired material.

In using the hammer it is gripped and swung in the usual manner, the stripper contacts with and is stopped by the material into which the nail is being driven, and the momentum of the head causes the driver 12 to drive the nail into the material. In swinging the hammer, the head moves substantially in an arc about a center located on or adjacent the handle, depending upon the manner in which the handle is gripped in the hand. It is desirable that the distance from this center to the bottom opening of the aperture 9 in the stripper be substantially constant for all positions of the stripper in order that there will be no motion between the stripper and the board or other material, after the stripper comes in contact with the board. This is accomplished by arranging the stripper or the aperture 9 in the stripper at an acute angle to the handle or preferably by causing the stripper to move in an arc about the swing center. This is preferably accomplished by forming the tongue 7 and the driver 12 on the desired arc. By causing the stripper to move in an arc as described, or by causing it to move in a plane at an acute angle to the handle, there is no tendency of the stripper to move relative to the board or other ma-

terial, when the head is moving toward the stripper and driving the nail.

In automatic hammers which have been designed heretofore, the head and stripper have been arranged at right angles to the handle, with the result that the head end of the nail is bent over as it is driven. The present construction causes the nail to be driven straight into the material.

The head and stripper are normally pressed apart by means of the spring 13 which is compressed as the head moves toward the stripper. The spring 13 lies normally partly within the hollow neck 6 and is moved farther into the neck as it is compressed.

The nails to be driven are arranged *seriatim* in a nail tape 14 which is arranged in the rail tape guide 15, which is secured to the stripper and which is pivoted adjacent its rear end to the handle. The point ends of the nails extend downward from the guides and the stripper is provided with a longitudinal passage 16 for the nail tape and a longitudinal passage 17 for the nail ends, which terminates at the aperture 9. The rear end of the handle is open so that the successive tape strips may be readily inserted as the nails are used. The nails are fed successively into the aperture 9 by means of the pawl 18 arranged in the slot 19 in the stripper. The pawl 18 is arranged below the nail tape and is provided with a plurality of teeth 21 which engage the bodies of the leading nails. The pawl is reciprocated to advance the tape by means of the spring 22, one leg 23 of which is secured to the stripper and the other leg 24 of which is connected to the pawl 18. The leg 24 contacts with the lower edge of the head 5 and is so arranged that the leg 24 is moved backward toward the leg 23 as the head moves toward the stripper, causing a backward movement of the pawl 18. The pawl is pivotally attached to the lower end of leg 24 and is pressed against the nails by a spring 25 arranged at the pivotal point. The spring 25 has slight tension, so that as the pawl is moved backward, it is moved slightly about the pivot by engagement of the teeth thereon with the nails, so that the teeth pass and engage the succeeding nails. As the hammer is lifted, the head moves away from the stripper allowing the spring 22 to expand, moving the pawl forward, and thereby bringing the leading nail into the aperture 9, from which it is driven on the next blow of the hammer. Means are also provided for preventing a backward movement of the nail tape when the pawl 18 is moving backward. Pivotaly attached to the stripper is a lever 26 which is normally pressed against the stripper by the spring 27. The lever is provided with an intumed end or blade 28 which engages in a slot in

the stripper and separates the aperture 9 from the passage 17, thereby locking the leading nail in the aperture. The slot 29 in which the blade 28 engages, preferably extends transversely of the stripper from face to face. That portion of the slot lying on the opposite side of the stripper from the lever 26, is partly closed by a bridge 31 and the edge of the blade 28 is provided with a notch 32 which overlies said bridge. The bridge prevents the blade from accidentally driving a nail transversely into the slot 29, should the nail occur directly opposite the slot. The lever 26 is also provided with a plurality of pins 33 which engage the succeeding nails in the tape and lock the tape in position. Means are provided for moving the blade and pins out of contact with the nails during the forward movement of the pawl, so that the pawl may operate to advance the tape.

It will be seen that the slot or passage 17 provides a free opening rearward of the driving aperture 9, when the blade 28 is withdrawn, but when the blade occupies the slot 29 the leading nail is locked in the aperture 9, in true alinement with the driver, and at the ultimate point from which it is driven out of the stripper. It follows from this construction that when the driver strikes the nail the latter will be driven true, and cannot be bent or deflected from the path of travel of the driver. I consider this a very important feature of my invention.

Arranged on the head 5 is a latch 34 provided with a projection 35 which coöperates with the bent arm 36 on the lever 26, to move the free end of the lever away from the stripper as the head and stripper are separated. The latch 34 is arranged in a recess 37 in the head and is pivoted at the end opposite the head 35, so that it is movable in an arc. The latch is normally held in a depressed position by a spring 38 arranged in the head 5. When the head and stripper are in their normal separated positions, the end of the arm 36 lies below the projection 35, and as a blow is struck and the head moves toward the stripper, the arm 36 forces the projection 35 upward. On account of the curvature of the arm 36 and the pivotal mounting of the latch 34, the arm disengages the projection 35 as the head 5 approaches the stripper, allowing the latch to fall to its normal position. The projection, with the latch in this position, lies in the path of the bent arm 36 on its downward movement, so that as the head moves away from the stripper, after the blow has been struck, the arm engages the projection causing the blade 28 and the pins 33 to be removed from the path of the nails, thereby allowing them to be fed forward by the pawl. When the head and stripper reach their limit of separation, the bent arm

disengages the projection, and the blade and pins snap back into the path of the nails. The parts described are preferably so timed that the blade 28 and pins 33 will not be withdrawn from their locking engagement with the nails in the strip or tape, until near the limit of separation of the head and stripper, whereupon the driver will disengage the tape and the spring 22 will be permitted to act on the pawl 18 and feed the next nail into position to be driven. Immediately thereafter the arm 26 will be tripped to lock this nail in alinement with the driver. The driver 12 drives the nails out of the tape 14, and as the successive nails are driven, the stripped tape is fed out at the end of the stripper. Arranged on the stripper below the extending tape is a slot 39 into which the blade 41 on the head is driven as a blow is struck, operating to cut off the extending section of the tape. Means have also been provided for locking the stripper in any position of its movement with relation to the head. Such means are advisable in instances where the nail is not driven completely into the material on the first blow and it is necessary to strike it several times to drive it home. An important function of this locking means with the present construction is that it may be employed to hold the stripper and head in a plurality of different positions of separation, depending upon the degree of projection of incompletely driven nails, and yet act to prevent separation of these parts to the point where the feeding pawl will be actuated. This insures that the nail-carrying tape will not be advanced while additional blows are being applied to a nail and thus prevents the aperture 9 from becoming jammed. The rear face of the tongue 7 is provided with a plurality of teeth or a rack 42 which is adapted to be engaged by a pawl 43 pivoted in the head. Pivotaly attached to the pawl is a link 44 which extends backward to a position adjacent the handle at which point it is pivoted to a lever 45 pivoted to the handle or neck. The lever 45 is provided with an ear 46, which is readily engaged by the finger of the operative so that the locking mechanism is readily operated, and in no manner interferes with the manipulation of the hammer. By raising or pulling with the finger on the ear 46, the pawl is disengaged from the rack and the stripper is free to move with relation to the head. Means are also provided for locking the locking mechanism in inoperative position. Arranged adjacent the lever 45 is a latch 47 which is adapted to engage a projection 48 on the lever and hold it in its retracted position. The latch is provided with a trigger 49 arranged on the opposite side of the handle in convenient position to be operated by the thumb of the operative. The lever 45 is normally pressed

forward by means of a spring 51 arranged in a suitable location. The latch 47 is also normally pressed downward, so that it snaps into engagement with the lever 45 as the lever is pulled backward. The spring 51 encircling the pivot of the latch may also operate to press the latch downward.

I claim:

1. In an automatic swing hammer, a handle, a head attached thereto, a curved driver fixed in said head and projecting therefrom, a stripper having an elongated curved aperture therein cooperating with said driver, said stripper being movable in the arc of said driver, and a curved tongue concentric with said driver and stripper aperture and slidably connecting said head and stripper.

2. In an automatic hammer constructed for free swinging movements by the operator to drive nails, a handle, a head attached thereto, a driver fixed in said head, the lower end of the driver lying at an acute angle to said handle, a stripper cooperating with said driver and lying normally at an acute angle to said handle, and means for feeding nails *seriatim* to said stripper in alinement with said driver.

3. In an automatic hammer, a handle, a head attached thereto, a driver fixed in said head, a stripper cooperating with said driver and having an aperture therethrough for the passage of a nail tape, said driver operating to drive the leading nail from said tape, means for advancing the tape through said aperture, and means for severing that part of the nail stripped tape projecting from the aperture.

4. In an automatic hammer, a handle, a head attached thereto, a driver fixed in said head, a stripper cooperating with said driver and having an aperture therethrough for the passage of a nail tape, said driver operating to drive the leading nail from the tape, means for advancing the tape, and a blade on said head arranged to sever the projecting part of the nail stripped tape.

5. In an automatic hammer, a handle, a head attached thereto, a driver fixed in said head, a sliding stripper guided in said head and having an aperture alined with said driver, a nail tape guide on said stripper, a pawl arranged to engage the nails in said tape, and a spring engaging said pawl and said head and arranged to move the pawl backward as the head and stripper approach each other, and to move the pawl forward as the head and stripper are separated from each other.

6. In an automatic hammer, a handle, a head attached thereto, a driver fixed in said head, a sliding stripper guided in said head and having an aperture alined with said driver, a nail tape guide on said stripper, a pawl arranged to advance said tape to present the nails *seriatim* to said driver, means

for locking the tape in position during the backward movement of said pawl, and a spring engaging said pawl and said head and arranged to move the pawl backward as the head and stripper approach each other, and to move the pawl forward as the head and stripper are separated from each other.

7. In an automatic hammer, a handle, a head attached thereto, a driver fixed in said head, a movable stripper cooperating with said driver, a nail tape guide in said stripper, means for advancing the tape to present the nails *seriatim* to said driver, a lever pivoted to said stripper, means thereon arranged to engage the nails in said tape, a bent arm on said lever, and a latch on said head arranged to be engaged by said arm and operating to withdraw the nail engaging means on the upward movement of the head with relation to the stripper.

8. In an automatic hammer, a head, a driver fixed therein, a stripper cooperating with said driver, a nail tape guide on said stripper, a reciprocating pawl for advancing said tape to present the nails *seriatim* to said driver, means for locking said nails in position during the backward movement of the pawl and for releasing said nails during the forward movement of the pawl, said means comprising a lever pivotally attached to the stripper, pins on said lever arranged to lie between the successive nails, a bent arm on said lever, and a latch on said head cooperating with said arm to cause the pins to be withdrawn during the forward movement of the pawl.

9. In an automatic hammer, a driver, a stripper cooperating therewith and having an aperture alined with the driver and a transverse aperture arranged adjacent to said first named aperture and extending through both walls of the stripper near the discharge end thereof, and having further a nail passage terminating at said first named aperture, a notched blade arranged for movement in said transverse aperture to separate said first named aperture from the nail passage and to lock the nails at the driving point, and a bridge in said transverse aperture in the wall toward which the blade moves inwardly and arranged to be engaged by a notch in the end of said blade.

10. In an automatic hammer, a handle, a head attached thereto, a stripper, means for feeding a strip of nails, actuated by the separating movement of the head and stripper, a tongue attached to said stripper and slidably engaging said head and arranged to limit the movement of the stripper with respect to said head, a rack on said tongue and a pawl in said head arranged to engage said rack and lock the head and stripper against separation to the point where said feeding means will be actuated.

11. In an automatic hammer, a handle, a

head attached thereto, a stripper cooperating with said head, means for feeding a strip of nails, actuated by the separating movement of the head and stripper, a tongue arranged to guide said stripper with respect to said head, said tongue being attached to said stripper and slidably engaging said head, a rack on said tongue, a pawl in said head arranged to engage said rack, said parts acting to lock the head and stripper against separation to the point where said feeding means will be actuated, a lever arranged adjacent said handle, and means connecting said lever with said pawl.

12. In an automatic hammer, a handle, a head attached thereto, a tongue slidable in said head, a stripper attached to said tongue, a rack on said tongue, a pawl arranged to engage said rack, a lever arranged adjacent said handle and connected to said pawl, and means arranged adjacent the handle for locking the pawl in inoperative position.

13. In an automatic hammer, a handle, a head attached thereto, a stripper slidably connected with said head, a rack associated with said stripper, a pawl in said head arranged to engage said rack, a lever arranged adjacent the handle for moving said pawl, and a latch for locking said lever in its inoperative position.

14. In an automatic hammer, a frame, a head attached thereto and carrying a driver, a nail carrying member movable relatively to the head, yielding means for separating said head and member, means actuated upon the separation of said parts to advance a strip of nails, and locking means for arresting the separation of said parts at a plurality of points.

15. In an automatic hammer, a frame, a head attached thereto and carrying a driver, a stripper movable relatively to the head, yielding means for separating said head and stripper, means actuated upon the separation of said parts to feed a strip of nails, and locking means acting automatically to hold the head and stripper in different positions of separation and to prevent sufficient separation to cause the advance of the nail strip.

16. In an automatic hammer, a frame, a head attached thereto and carrying a driver, a nail carrying member movable relatively to the head, yielding means for separating said head and member, means actuated upon the separation of said parts to feed a strip of nails, locking means acting automatically to arrest the separation of said parts at a plurality of points, and manual means for rendering said locking means operative or inoperative, at will.

17. In an automatic hammer, a frame, a head attached thereto and carrying a driver, a nail strip carrying member movable relatively to said head and having a driver ap-

erture, means actuated upon the separation of said head and member to advance the nail strip and feed successive nails under the driver, and means for locking the nails in position to be driven through said aperture comprising a blade and actuating mechanism constructed and arranged to hold the blade in locking position during the driving stroke but to remove it from such position on the reverse stroke during the advance of the nail strip.

18. In an automatic hammer, a frame, a head attached thereto and carrying a driver, a stripper movably connected to the frame, means actuated by the separation of the head and stripper to feed nails into driving position, a lock for holding successive nails in such position comprising a lever pivoted to the stripper and carrying a blade, and actuating mechanism for said lock.

19. In an automatic hammer, a handle, a head carrying a driver, a stripper movable toward and from said head, means actuated upon the separation of said parts to advance a strip of nails for positioning successive nails in alinement with the driver, and locking means for limiting the separation of said head and stripper to prevent the operation of said nail strip advancing means.

20. In an automatic hammer, the combination of a handle arranged to be swung by the operator, a head attached thereto, a curved driver fixed in said head, a stripper cooperating with said driver, and having a curved aperture to receive said driver and a nail-tape slot entering said aperture transversely, said stripper being arranged to move relatively to the driver in an arc whose center coincides substantially with that about which the hammer is swung.

21. In an automatic swing hammer, the combination of a handle, a head attached thereto, a curved driver fixed in said head, a stripper having a curved aperture alined with said driver and a nail-strip slot entering said aperture transversely, said stripper being arranged for movement relatively to the driver, and a feeding mechanism for a strip of nails actuated by the relative movement of the stripper and driver, said

movement being in an arc whose center coincides substantially with that about which the hammer is swung by the operator to drive nails.

22. In an automatic swing hammer, a handle, a head attached thereto, a curved driver fixed to said head, a stripper, cooperating with said driver, and a curved tongue concentric with said driver slidably connecting said head and stripper, the stripper being arranged to move relatively to the driver in an arc whose center coincides substantially with that about which the hammer moves as it is swung by the operator.

23. An automatic hammer having, in combination, a handle constructed to be grasped by the operator while the hammer is swung freely toward and from the work, a head attached to the handle, a curved driver affixed to said head, and a stripper having a curved aperture to receive said driver and supported for movement relatively to the driver in an arc whose center coincides substantially with that about which the hammer is swung, said driver and aperture being arranged at an acute angle to that part of the handle which is grasped by the operator.

24. An automatic hammer having, in combination, a handle constructed to be grasped by the operator while the hammer is swung freely toward and from the work, a head attached to the handle, a driver attached to said head and arranged at an acute angle to the portion of the handle which is grasped by the operator, a stripper arranged for movement relatively to the driver, and a feeding mechanism for a strip of nails actuated by the relative movement of the stripper and driver, said movement being in an arc whose center coincides substantially with that about which the hammer is swung by the operator to drive nails.

In testimony whereof, I have hereunto set my hand at San Francisco, California, this 6th day of June, 1913.

CLARENCE S. BODEN.

In presence of—

H. G. PROST,
M. LE CONTE.