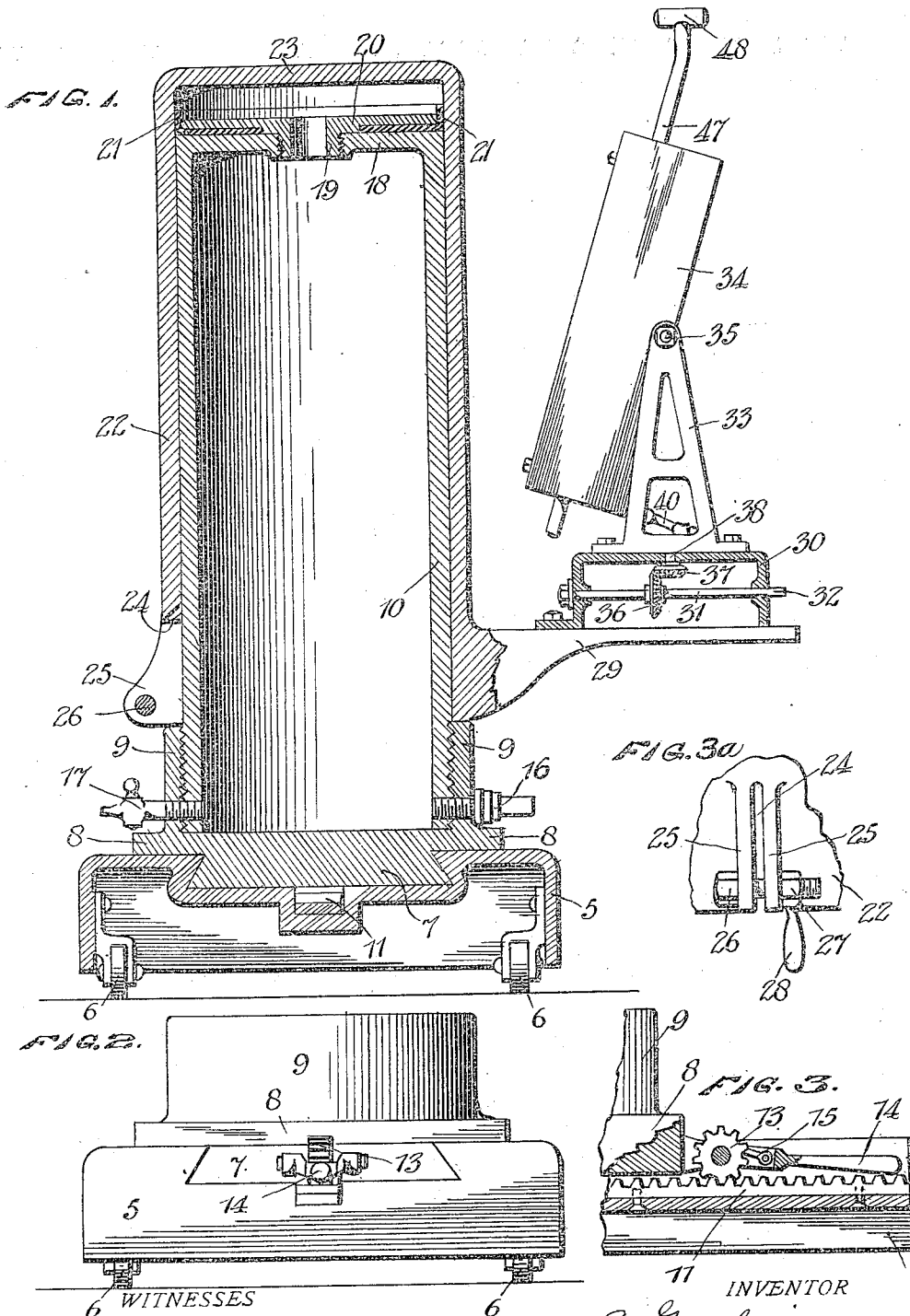


A. GUTHRIE.
STAY BOLT HEADER.
APPLICATION FILED MAR. 27, 1908.

960,313.

Patented June 7, 1910.

3 SHEETS—SHEET 1.



WITNESSES
Chas. H. Davies.
Myron F. Clear.

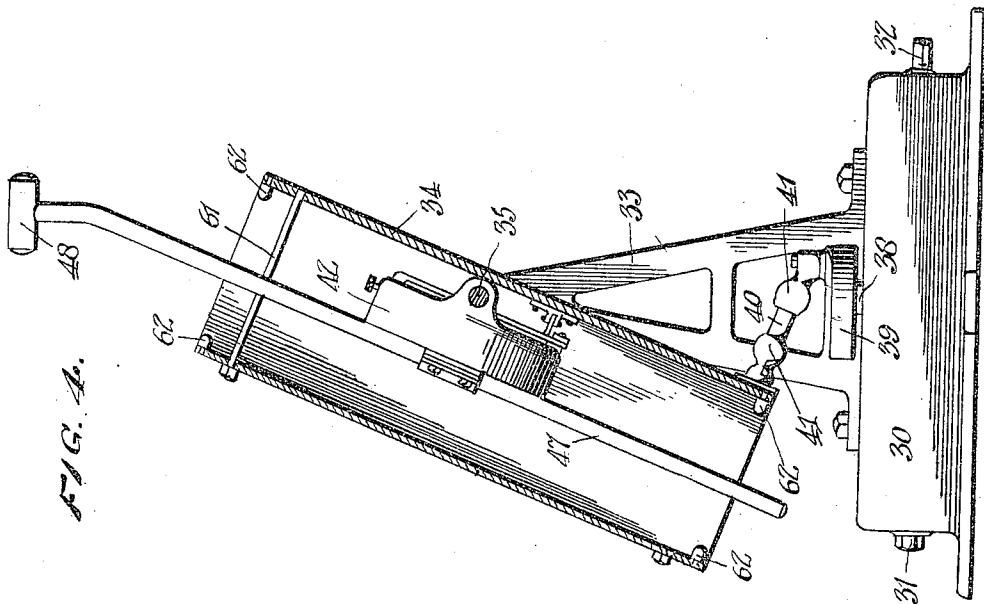
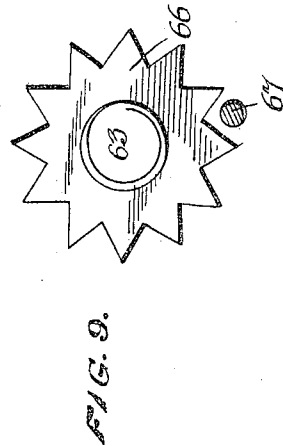
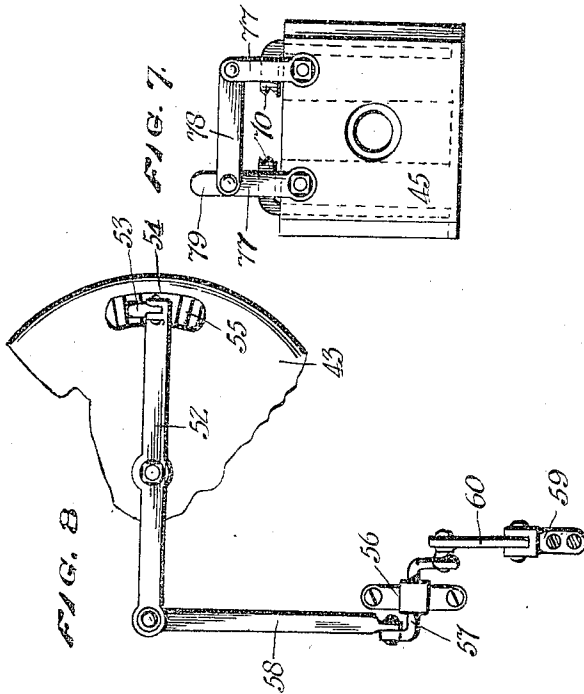
INVENTOR
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3 SHEETS—SHEET 2.



WITNESSES
Chas. H. Davies,
Myron J. Clean.

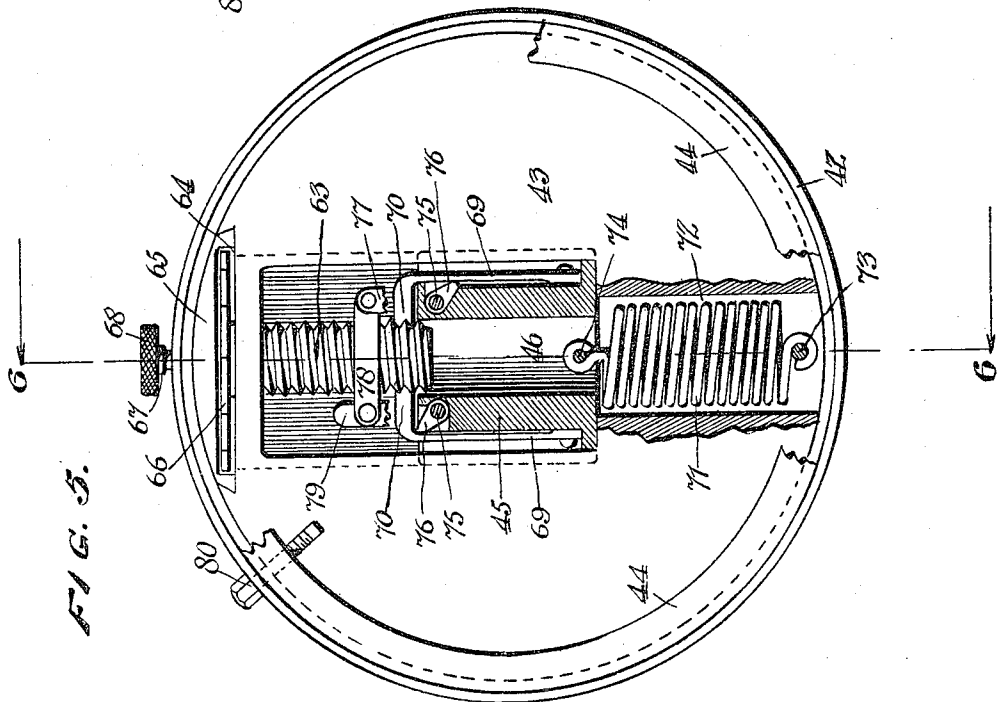
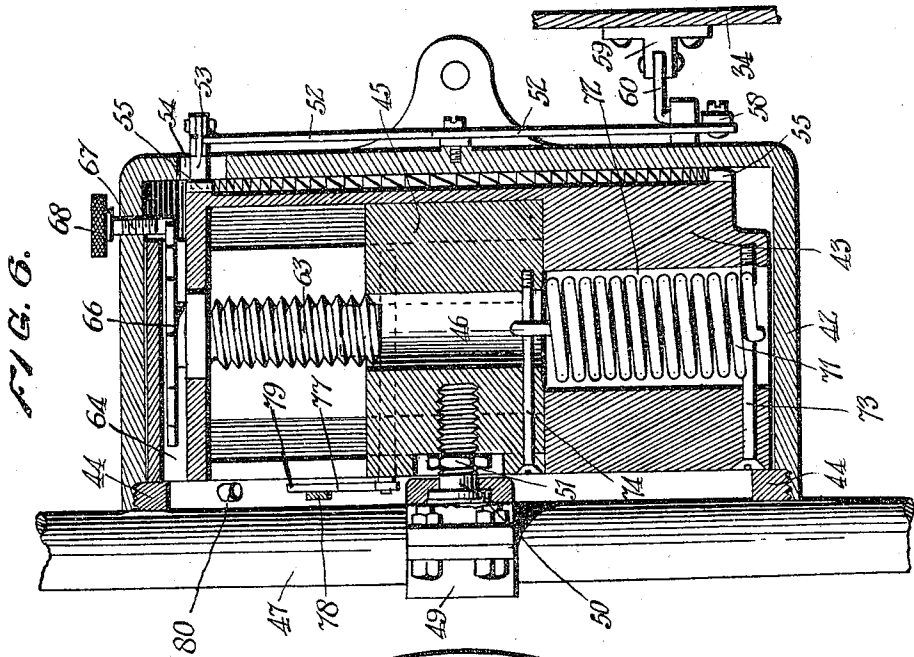
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3 SHEETS—SHEET 3.



WITNESSES
Chas. H. Davies
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UNITED STATES PATENT OFFICE.

ASA GUTHRIE, OF CHICAGO, ILLINOIS.

STAY-BOLT HEADER.

960,313.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed March 27, 1908. Serial No. 423,653.

To all whom it may concern:

Be it known that I, ASA GUTHRIE, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stay-Bolt Headers, of which the following is a specification.

My invention relates to stay bolt headers, and the object thereof is to provide a mechanically operated hammer for heading the ends of stay bolts projecting through a boiler plate or the like.

A further object of my invention is to provide a mechanically operated hammer for heading the ends of stay bolts, in combination with means to cause the hammer head to travel in a series of circular paths from the center of the stay bolt end as it successively strikes the same.

A further object of my invention is to provide a novel supporting frame for the heading mechanism, which may be readily adjusted in several directions to quickly bring the hammer into alinement with the work.

A further object of my invention is to provide novel means for returning the hammer to its normal or starting position when it has reached a desired point in its travel.

Further objects and advantages will appear in the course of the following description of the construction and operation of my invention, reference being made to the accompanying drawings, forming a part of this specification, in which like numerals are used to designate like parts throughout the several figures, and in which,

Figure 1 is a partial vertical sectional view and partial side elevation of my entire apparatus. Fig. 2 is a side elevation of the base of the supporting stand. Fig. 3 is a fragmentary sectional view of an adjusting portion of the supporting stand base. Fig. 3^a is a fragmentary elevation of a clamping portion of the supporting stand. Fig. 4 is a part vertical sectional view and part side elevation of the hammer operating mechanism removed and on an enlarged scale. Fig. 5 is a face view, partly broken away and in section, of the rotating hammer block-carrying disk, and its associated parts. Fig. 6 is a vertical sectional view taken through the same and illustrating the connection of the hammer thereto. Fig. 7 is a front elevation of the sliding hammer

block. Fig. 8 is a detail elevation of the connection between the hammer hood and disk casing, for rotating the disk, and Fig. 9 is a top plan view of the hammer block actuating star wheel.

In the practical embodiment of my invention, I provide a device embodying a supporting stand comprising a preferably elongated rectangular base 5, mounted upon rollers 6 and provided in its upper face with a longitudinal dove-tailed groove for the reception of the dove-tailed lower end 7 of the extension base 8, having an internal threaded upstanding tubular portion 9 for the permanent reception therein of a tubular supporting member 10. The supporting frame base 5 is provided centrally and longitudinally of its dove-tailed groove with a channel cut out therefrom, and provided therein with a rack 11, adapted to be engaged by a pinion 13, journaled upon the extension base 8, to which is also connected a handle 14 having a pawl 15, in engagement with said pinion 13, whereby the extension base 8 may be moved longitudinally of the supporting frame base 5 in a comparatively easy manner. Thus when the device has been moved, upon its rollers 6, to the side of a boiler or the like which has horizontal alined bolt-heads to be operated on, and the device jacked for one of such bolt-heads, by wedges under its rollers, the supporting frame may be moved longitudinally with respect to its base for the other bolt-heads without the trouble of removing the wedges and rejackng.

Extending through the tubular portion 9 of the extension base 8, and through the supporting member 10 therein, is an inlet pipe 16, for the introduction of compressed air or the like, within said tubular member 10, a valved outlet pipe 17, leading outwardly from said tubular member 10, at a point diametrically opposite the inlet pipe 16, serving as an exhaust port when desired. In its upper closed end 18, the tubular member 10 is provided with a central opening threaded for the reception of the central portion 19 of a gasket ring 20 for clamping a washer 21.

Mounted about the tubular supporting member 10 is a tubular extension member 22 telescopically slidable thereon and provided with an upper closed end 23 against which the air impinges through the open-

ing in the upper end 18 of said tubular member 10 to slide the extension member 22 upwardly thereon, said member 22 being provided with a longitudinal slot 24, in its lower edge and having its material adjacent and along said slot upturned to form outstanding shoulders 25. The shoulders 25 are provided with alined openings adjacent the extreme edge of said extension member 22, for the reception of a headed bolt 26 threaded on its end for the reception of a nut 27, having a handle 28 for readily manipulating the same. The clamping means just described are adapted to reduce the diameter of the lower edge of the extension member 22, in order to clamp the same against the tubular supporting member 10, and maintain the same relatively stationary therewith when the desired adjustment has been reached. The extension member 22 carries a supporting platform 29, extending outwardly therefrom and arranged to support the hammer and its operating mechanism, as hereinafter described.

Mounted upon the platform 29 is the hammer operating mechanism comprising a hollow base casting 30, secured upon said platform 29, having a horizontal shaft 31 journaled therethrough, and provided upon its forward projecting end with a squared portion 32 for the reception of a crank or like operating element.

Extending upwardly from the base casting 30 are a pair of tapering side standards 33, between the apices of which a hood 34 is pivoted by a horizontal bolt 35, extending between said side standards 33 and through the hood 34 centrally of its ends. The horizontal shaft 31 is provided with a beveled gear 36, meshing with a beveled gear 37 carried upon a short vertical shaft 38, projecting upwardly through the base casting 30, and provided with a disk crank 39, at the upper outer end thereof. The disk crank 39 is connected by a short pitman to the hood 34, said pitman comprising an arm 40, having ball ends for engagement within sockets 41, carried by the said disk crank 39 and the said hood 34, in order to complete a loose connection whereby said hood 34 will be oscillated upon its pivot 35 to produce a vibratory motion thereof. The said vibratory motion of the hood 34 is communicated to a circular casing 42 centrally pivotally mounted within the said hood 34 and upon the pivot bar 35 thereof. The casing 42 is adapted to receive therein a rotatable disk 43, held in position therein by a retaining ring 44, threadedly engaging within the said casing adjacent its circular edge and lapping inwardly upon said disk 43. The disk 43 is provided with a central slotted cut out portion extending therethrough and adapted for the reception of a readily slidable block 45, having a central transverse circular open-

ing 46, extending therethrough. The hood 34 is preferably constructed rectangular in cross section and with open ends.

Extending longitudinally through the hood 34 is the hammer rod 47 having a head 48 upon its upper end to strike the work and provided at an approximately central point with a split bolted sleeve 49 having a recess in one of its portions for the reception of a headed end of a bolt 50 threaded for a major portion of its length and adapted to be screwed within a threaded opening extending centrally longitudinally of the hammer block 45 and at right angles to its opening 46. Said bolt 50 is further provided with a nut 51 adapted to be screwed thereon before the insertion of said bolt into said block 45, and subsequently adapted to be screwed rearwardly against said block 45 in order to bind against the same and lock the bolt 50 from accidental displacement. Thus the hammer rod 47 is rotatable upon the bolt 50 as its pivot.

In order to cause the hammer head 48 to travel in a circular manner from a point centrally of the work to which it is initially alined, I provide the mechanism which I will now describe. Mounted upon the rear closed face of the casing 42 is a centrally pivoted oscillatory arm 52, having a pivoted spring pressed pawl 53 projecting through an opening 54 in the casing 42, and into engagement with a circular rack face 55 extending around the inner face of the rotating disk 43, adjacent the edge thereof, and to rotate the same. Mounted also upon the casing 42 is a bracket 56 through which projects a rock shaft 57 having angular ends, the extremity of one of which is loosely pivotally connected to the oscillatory arm 52, by the connecting link 58, and the extremity of the opposite angular end of which is loosely pivotally connected by means of an arm 60, within a bracket 59 secured within the hood 34. Thus when the hood 34 and the casing 42, in their vibratory movements, swing away from each other upon their pivot 35, the shaft 57 will be rocked, pulling upon the connecting link 58 and oscillating the pivot arm 52 sufficiently to rotate the disk 43 a distance equal to one of the notches of its ratchet 55. The upper end of the hood 34, is provided with spaced parallel rods 61, between which the hammer rod 47 slides. Said hood 34 is further provided at its upper and lower ends and at the points where the hammer rod 47 strikes the same, with elastic buffers 62. The hammer rod 47 being thus prevented from rotation with the rotation of the disk 43, by means of the guide rods 61, will, as thus far shown, remain in the same relative position, except for its vibratory movement. The rotating disk 43 is provided with a second slotted opening 64, formed within a remov-

able dove-tailed block 65 forming a portion of its periphery. Journaled through the material of said rotating disk 43, between its slotted opening for the reception of the hammer block 45, and its opening 64 just described, is a screw bar 63, having its threaded stem projecting centrally within said hammer block opening, and being provided upon its opposite end with a star wheel 66 located within the said slotted opening 64, the said dove-tailed block 65, being formed removable in order that said star wheel may be inserted in position.

At a point in its periphery, the disk casing 42 is provided with a threaded pin 67 projecting therethrough and into the path of travel of the peripheral notches of the said star wheel 66, as shown in Figs. 5, 6, and 9, said threaded pin having a knurled handle 68 by which its length of projection within said casing 42 may be regulated. Thus upon the completion of each revolution by the rotating disk 43, the pin 67 will engage the star wheel 66, rotating the same and the screw bar 63 to which it is attached. To this end, I provide the hammer block 45 with a pair of spring arms 69 secured to the sides thereof, and provided with angular upper ends 70, projecting inwardly and grooved for engagement with the threaded bar 63, to which said spring arms 69 are tensioned to clamp. The screw bar 63 being in alinement with, and adapted to enter the central circular opening 46 through the hammer block 45, and being rotated one notch of its star wheel 66, each revolution of the disk 43, the said hammer block 45 will be gradually drawn upwardly from its position shown in Figs. 5 and 6, thus gradually throwing the pivot 50 of the hammer rod 47, off the center of said rotating disk and thereby causing gradual enlarging revolutions of said pivot about the center of said disk 43.

The mode of operation of the parts just described, whereby to cause the hammer head to travel in paths formed by a series of concentric circles of increasing diameters, is very simple when once understood. Suppose, for instance, slidable block 45 is in its central position, with the hammer head alined with the center of the bolt head to be operated on, and the mechanism operated. The hammer head will then, of course, be reciprocated and caused to strike a series of blows upon the center of the bolt-head before block 45 starts to slide. After a complete revolution of the hammer block 45, the same is moved radially as before described, and the hammer head 48 will then strike a series of blows while traveling in the path of a circle having the center of the bolt as its center. Upon the further outward radial movement of block 45, the hammer head 48 will be made to travel in

the path of a circle outside of its first circular path of travel and concentric therewith. For every movement of block 45 outwardly the hammer head is made to travel in a new circular path having a greater diameter than its former path. Thus the hammer head 48 first strikes a series of blows upon the center of the bolt and then strikes a series of blows in circles which are concentric to each other until the circumferential edge of the bolt is reached.

In order to automatically return the hammer block 45 and the pivot 50 of the hammer rod 47 to the center of the rotating disk 43, I provide a mechanism for releasing the spring arms 69, forming a split nut, and I further provide a coil spring 71 mounted within a bore 72 in the rotating disk 43, below the hammer block 45 and connected at its ends to screw pins 73 and 74 spanning the said bore 72 of the disk 43, and the central opening 46 of the hammer block 45, respectively. The mechanism for releasing the split nut embodying the spring arm 69, comprises a pair of rock shafts 75, mounted in the hammer block 45 adjacent the said spring arms 69, and provided with cam pieces 76 secured thereon, and located within and against said spring arms 69 in such manner that rotation of said rock shafts 75 in the same direction will cause said cams 76 to bear against said spring arms 69 and force the same outwardly from engagement with the screw bar, 63.

Each of the rock shafts 75 is provided with upwardly extending arms 77, secured thereto and loosely pivotally connected by an arm 78, one of said arms 77 having an extension 79 beyond said arm 78 adapted to strike a pin 80 threaded through the peripheral edge of the casing 42, and through the ring 44, said pin 80 being adjustable as to its length of inward extension in order that the extension 79 will be struck thereby, when the hammer head 48 has traveled to and around the extreme edge of the stay bolt end.

Having fully described my invention, I claim:

1. In a stay bolt header, the combination of a rotatable element, means in connection therewith for rotating and oscillating the same, a block mounted within, and radially movable to and from the center of, said rotatable element, means actuated by the rotation of said element for moving said block, a rod provided upon one end with a hammer head, and rotatably connected to said block, and means forming a guide for said rod between its said head and its said connection to said block, adapted to permit of the oscillation thereof, substantially as described.

2. In a stay bolt header, the combination of a rotatable element, means in connection

therewith for rotating and oscillating the same, a block mounted within, and radially movable to and from the center of, said rotatable element, means actuated by the rotation of said element, for moving said block, a rod provided upon one end with a hammer head, and rotatably connected to said block, and spaced parallel guide rods between which said rod oscillates, arranged between its said head and the said connection thereof to said block, substantially as described.

3. In a stay bolt header, the combination of a rotatable element, oscillatory means in which said rotatable element is mounted, means to rotate said element by its oscillation, a block mounted within, and radially movable to and from the center of, said element, means actuated by the rotation of said element for moving said block, a rod provided upon one end with a hammer head, and rotatably connected to said block, and means forming a guide for said rod between its said head and its said connection to said block, adapted to permit of the oscillation thereof, substantially as described.

4. In a stay bolt header, the combination of a rotatable element, means in connection therewith for rotating and oscillating the

same, a rod provided upon one end with a head, a block to which said rod is swivelly connected, said block being mounted within said rotatable element for radial movement from the center thereof, means for moving said block by the rotation of said element whereby to cause travel of the said rod connection in a circular path, and means forming a guide for said rod between its said head and its said connection to said block, adapted to permit of the oscillation thereof, substantially as described.

5. In a device of the character described, the combination of a horizontal roller-mounted supporting base, a supporting stand horizontally slidably mounted upon said base, manually operable connections between said stand and said base for limiting the sliding of the former to a step by step movement, and a bolt heading mechanism carried by the supporting stand, substantially as described.

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

ASA GUTHRIE.

Witnesses:

FRANK C. SHAFER,
HURSHEL ORCUTT.