Dec. 4, 1928. 1,694,284

M. SANTA ANA

ELECTRIC HAMMER

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Fig. 1.

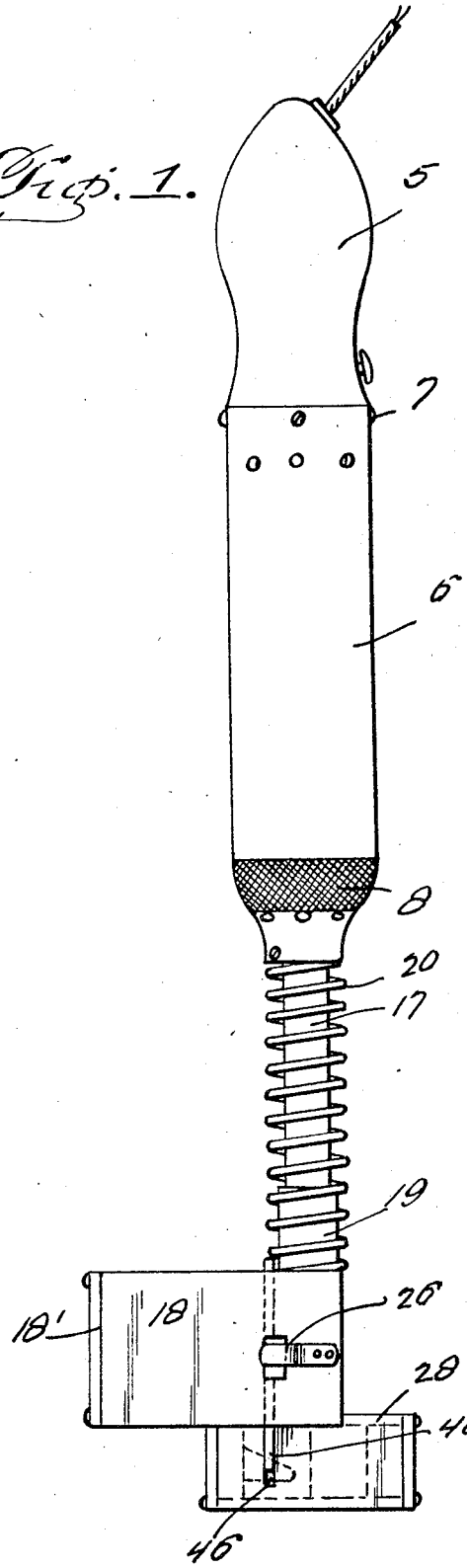


Fig. 3.

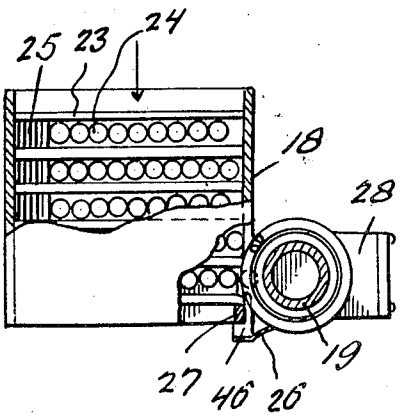
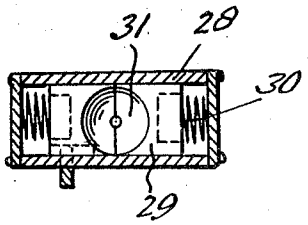


Fig. 4.



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Fig. 2.

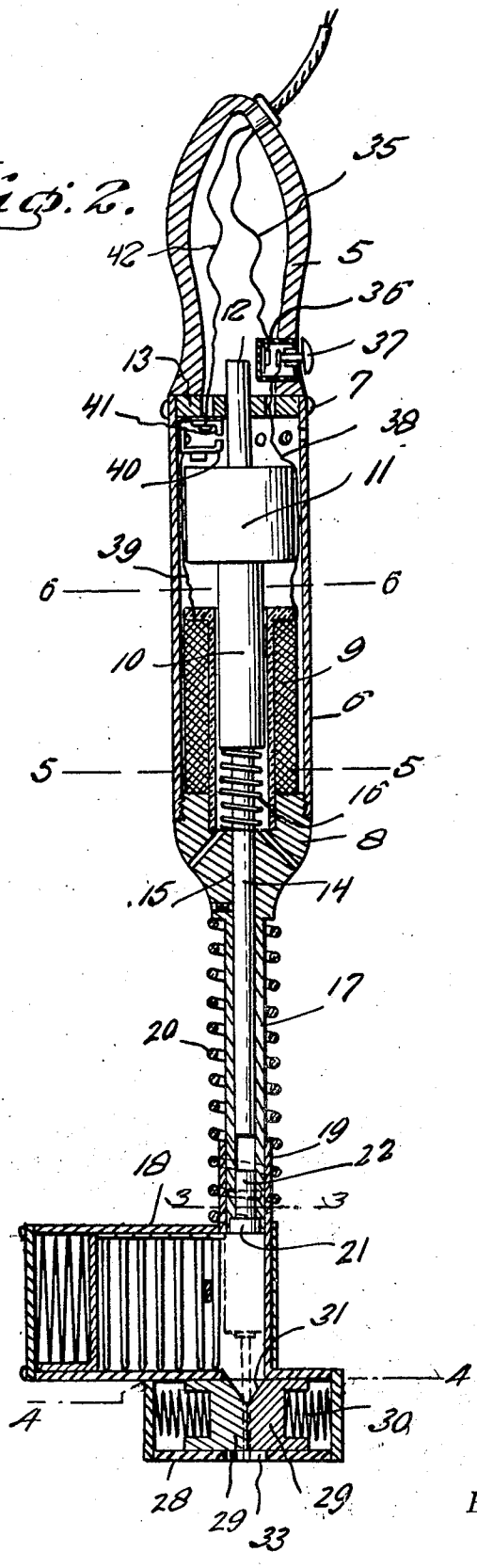


Fig. 5.

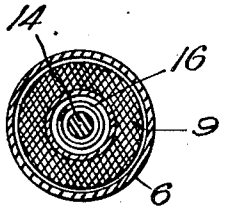
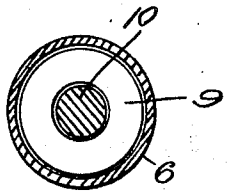


Fig. 6.



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Fig. 7.

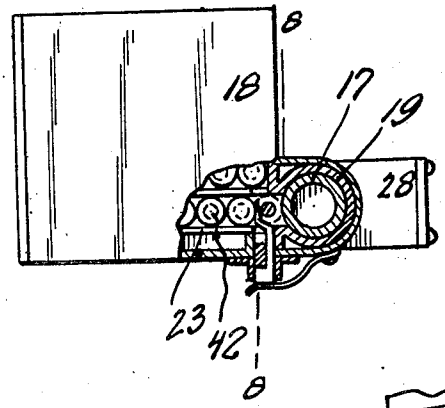
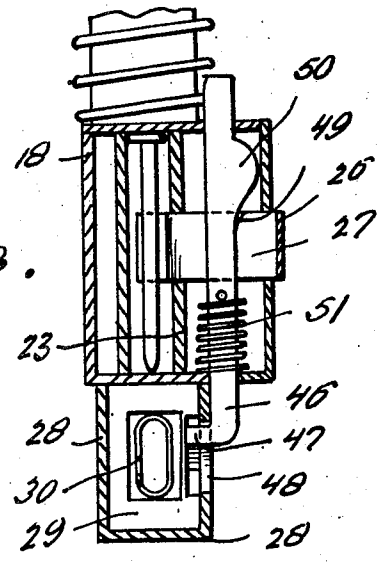


Fig. 8.



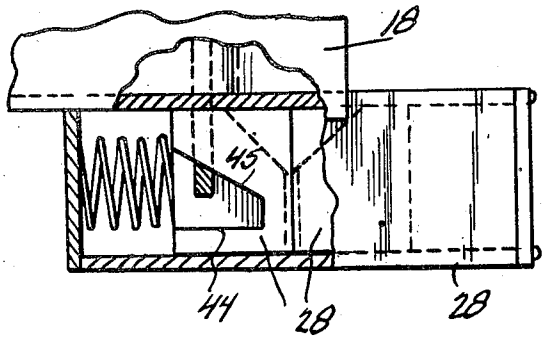


Fig. 9.

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Patented Dec. 4, 1928. 1,694,284

UNITED STATES PATENT OFFICE.

MAX SANTA ANA, OF HUNTINGTON PARK, CALIFORNIA.

ELECTRIC HAMMER.

Application filed December 1, 1927. Serial No. 237,040.

The present invention relates to an electric hammer and has for its prime object to provide an electric hammer having a magazine structure mounted thereon for feeding nails to the hammer in an automatic manner.

A still further important object of the invention resides in the provision of an electric hammer of this nature which is simple in its construction, strong and durable, inexpensive to manufacture, compact and thoroughly efficient and reliable in operation and otherwise well adapted to the purpose for which it is designed.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings:—

Figure 1 is an elevation of the hammer embodying the features of my invention,

Figure 2 is a longitudinal section therethrough,

Figure 3 is a transverse section taken substantially on the line 3—3 of Figure 2,

Figure 4 is a transverse section taken substantially on the line 4—4 of Figure 2,

Figure 5 is a transverse section taken substantially on the line 5—5 of Figure 2,

Figure 6 is a tranverse section taken substantially on the line 6—6 of Figure 2,

Figure 7 is a sectional view similar to Figure 3 but showing the armature tube depressed,

Figure 8 is an enlarged detail section taken substantially on the line 8—8 of Figure 7, and,

Figure 9 is an enlarged detail sectional elevation of the holding block casing illustrating interior portions thereof.

Referring to the drawing in detail it will be seen that the numeral 5 denotes a hollow handle having a cylindrical casing 6 fixed to one end thereof by means of screws 7 or in any other suitable manner. A cap 8 is threadedly engaged in the lower end of the casing 6. In the casing 6 there is mounted a solenoid 9 through which is slidable an armature 10 having an enlargement 11 at the upper end thereof from which extends a guide pin 12 through an opening in a partition 13. An armature rod 14 extends from the other end of the armature through an opening 15 in the cap 8. A spring 16 is disposed about the armature rod 14 and impinges against the cap 8 and the lower end of the armature 10 so as to normally hold said armature raised as is shown clearly in Figure 2. A tube 17 extends outwardly from the cap 8 and functions as a guide for the rod 14. A nail magazine 18 has a sleeve portion 19 rising therefrom and telescoping over the tube 17. A spring 20 is disposed about the sleeve 19 and the tube 17 normally holding them in the extended position shown in Figure 2. A hammer head 21 has a shank 22 slidable in the lower end of the tube 17 to be struck by the armature rod 14 as will be later explained.

The magazine 18 has a plurality of plates 23 mounted therein with nails 24 therebetween and springs 25 to urge the nails toward the end of the casing adjacent the tube 17. Only one set of nails between a pair of the partitions will be in proper position to be urged under the hammer head 21 as will be apparent from an inspection of Figure 3 and as soon as this set of nails has been used up, the plate will be pushed in the direction of the arrow shown in Figure 3, so as to bring into play another set of nails and one of the plates will be pushed out of the casing and may be reinserted with the spring at the first end of the casing with a new set of nails as will be quite apparent. The casing 18 has a removable end plate 18′ for this purpose.

A leaf spring 26 is fixed to the outside of the casing and urges inwardly a separator between the first and second nail of the set of nails which are in the active position in the magazine. A casing 28 is mounted below the magazine 18 and has blocks 29 slidable therein and pressed inwardly toward each other by springs 30. The upper portions of the blocks 29 are provided with depressions 31 which come together to form a guide so that the point of the first nail will fall therein. By pressing downwardly on the handle 5 the tube 17 is depressed to the dotted line position shown in Figure 2 so that the nail is forced through the blocks 25 and through the opening 33 in the bottom of the casing 28 ready to be driven home.

One lead of the electric circuit is shown at 35 extending through the handle 5 to the fixed terminal of a switch 36. The movable terminal 37 of the switch has a wire 38 leading therefrom to the solenoid 9. Another wire from the solenoid 9 is disposed at 39 leading to a spring contact 40 normally

spaced from a fixed contact 41 from which extends the other lead 42. These leads 35 and 42, of course, are connected with a suitable source of electric energy. By closing the switch 36 the spring 16 causing the contacts 40 and 41 to be in engagement with each other, the solenoid 9 is energized and attracts the armature 10 downwardly so as to cause the rod 14 to strike the shank 22 of the hammer head 21 which will cause this hammer head to drive the nail between the blocks 29. When the solenoid moves downwardly the circuit is broken to cause the separation of the contacts 40 and 41 and the spring 16 will return the armature thus causing a continuous make and break and a reciprocation to the rod 14 for striking the shank 22 of the hammer head 21. As the nail is driven downwardly the tube 17 is forced still further downwardly between the blocks 25 since they are no further needed to guide the nail since it has been partially driven home. One of the blocks 29 is provided with a notch 44 to provide an inclined edge 45. A bar 46 has an angular extension 47 at one end disposed through a slot 48 in one wall of the casing 28 so as to engage the inclined edge 45. The separator 29 is provided with a shoulder 49. The bar 46 has a cam 50 to engage this shoulder 49 when the bar 46 is pushed downwardly. A spring 51 normally holds the bar 46 raised. But as the blocks are separated, the inclined surface 45 will cause the bar 46 to move downwardly so that the cam engages the shoulder 49 and pushes the separator 27 out of the way so that the second nail will be in position to fall into the guide way 31 as soon as the tube 17 is allowed to be withdrawn from the magazine by the spring 20 and of course the blocks will come together and allow the spring 51 to push the bar 46 upwardly and the spring 26 will therefore push the separator 27 between the next two nails.

It is thought that the construction, operation, and advantages of this invention will now be quite apparent to those skilled in this art without a more detailed description thereof. The present embodiment of the invention has been disclosed in detail merely by way of example since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:—

1. In a device of the class described, a magazine, plates in the magazine for holding a series of nails therebetween, a spring urging the nails in one direction, a separator between the first and second nails, a spring normally holding the separator in place, a bar having a cam, a spring holding the bar in one position, said separator having a shoulder engageable by said cam, a casing on the magazine, a pair of spring pressed blocks in the casing for functioning as guides for nails, one of said blocks being provided with a notch having an inclined edge, and an offset end on said bar engageable with said edge so that when the blocks are separated the bar is moved to bring the cam into play, against the shoulder of the separator and to release the separator between the first and second nails.

2. In a device of the class described, a magazine, plates in the magazine for holding a series of nails therebetween, a spring urging the nails in one direction, a separator between the first and second nails, a spring normally holding the separator in place, a bar having a cam, a spring holding the bar in one position, said separator having a shoulder engageable by said cam, a casing on the magazine, a pair of spring pressed blocks in the casing for functioning as guides for nails, one of said blocks being provided with a notch having an inclined edge, and an offset end on said bar engageable with said edge so that when the blocks are separated the bar is moved to bring the cam into play against the shoulder of the separator and to release the separator between the first and second nails, a tube, a sleeve on the magazine to slidably receive the tube so that said tube may be depressed in the magazine and between the guide blocks, a rod slidable in the tube, a hammer having a shank in the tube to be struck by said rod, and means for reciprocating the rod to operate the hammer.

3. In a device of the class described, a magazine, plates in the magazine for holding a series of nails therebetween, a spring urging the nails in one direction, a separator between the first and second nails, a spring normally holding the separator in place, a bar having a cam, a spring holding the bar in one position, said separator having a shoulder engageable by said cam, a casing on the magazine, a pair of spring pressed blocks in the casing for functioning as guides for nails, one of said blocks being provided with a notch having an inclined edge, and an offset end on said bar engageable with said edge so that when the blocks are separated the bar is moved to bring the cam into play against the shoulder of the separator and to release the separator between the first and second nails, a tube, a sleeve on the magazine to slidably receive the tube so that said tube may be depressed in the magazine and between the guide blocks, a rod slidable in the tube, a hammer having a shank in the tube to be struck by said rod, means for recipro-

cating the rod to operate the hammer, and spring means for normally holding said tube out of the magazine.

4. In a device of the class described, a magazine, plates in the magazine for holding a series of nails therebetween, a spring urging the nails in one direction, a separator between the first and second nails, a spring normally holding the separator in place, a bar having a cam, a spring holding the bar in one position, said separator having a shoulder engageable by said cam, a casing on the magazine, a pair of spring pressed blocks in the casing for functioning as guides for nails, one of said blocks being provided with a notch having an inclined edge, and an offset end on said bar engageable with said edge so that when the blocks are separated the bar is moved to bring the cam into play against the shoulder of the separator and to release the separator between the first and second nails, a tube, a sleeve on the magazine to slidably receive the tube so that said tube may be depressed in the magazine and between the guide blocks, a rod slidable in the tube, a hammer having a shank in the tube to be struck by said rod, and means for reciprocating the rod to operate the hammer, spring means for normally holding said tube out of the magazine, a casing on the tube, a solenoid in the last mentioned casing, an armature in the solenoid, spring pressed in one position and connected with the rod, and make and break means associated with the armature to cause reciprocation thereof.

In testimony whereof I affix my signature.

MAX SANTA ANA.