

Sept. 19, 1933.

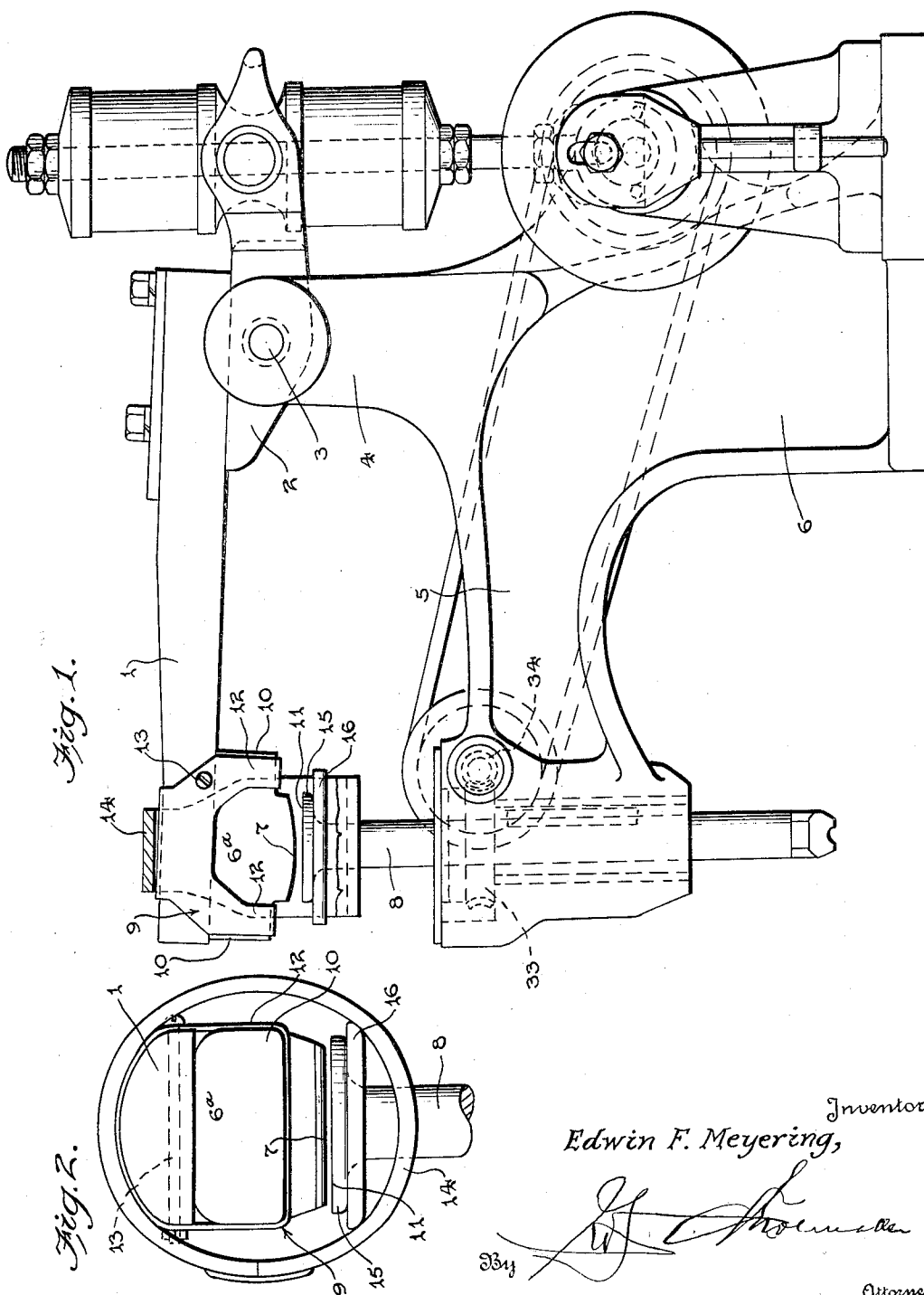
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1,927,097

HELVE HAMMER

Filed Jan. 11, 1932

2 Sheets-Sheet 1



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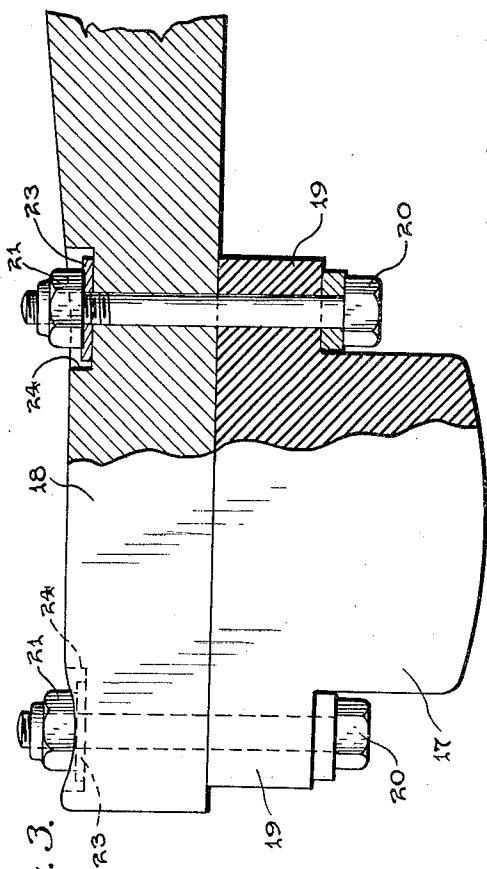


Fig. 3.

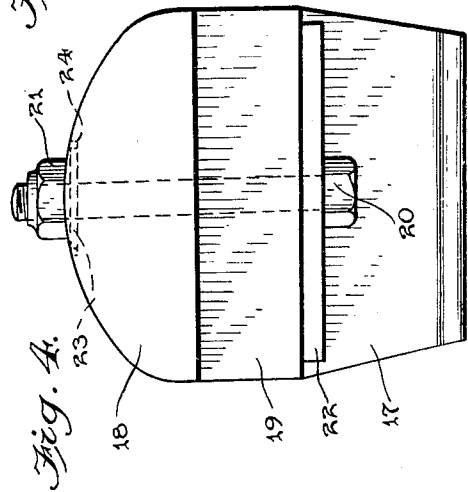


Fig. 4.

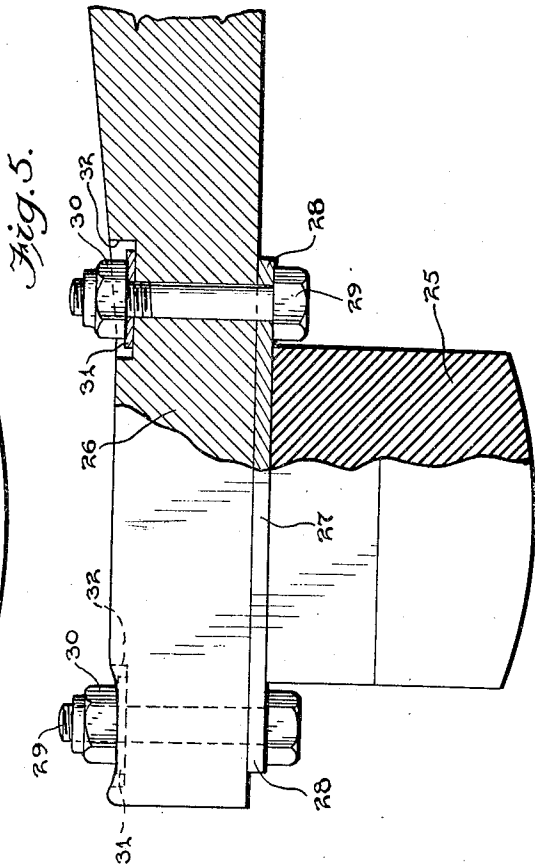


Fig. 5.

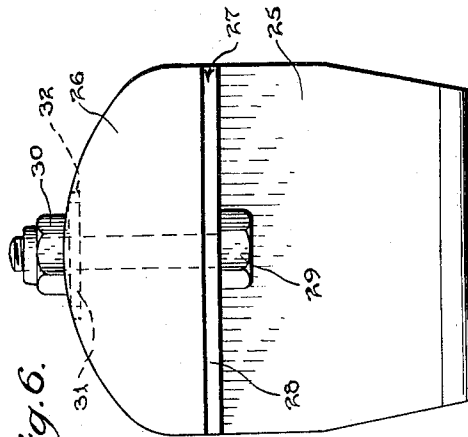


Fig. 6.

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UNITED STATES PATENT OFFICE

1,927,097

HELVE HAMMER

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15 Claims. (Cl. 78—43)

The present invention relates to helve hammers.

The object of the present invention is to improve the construction of helve hammers of the type shown and described in the Leckinger Patent, No. 1,293,741, dated April 1, 1919, in which a reciprocating tool or hammer is operated by a power driven helve.

The object of the present invention is to improve the construction of certain parts of such machine so as to obtain greater durability, also to relieve strain on other parts, and also to stabilize the action of the machine.

The invention relates particularly to the assembly of the resilient cushion between the forward end of the helve and the reciprocating tool or hammer. In previous designs or methods, the cushion was held in assembly with both helve and hammer in such a manner which necessitated either a relatively tight assembly or the use of cushions of tubular construction which have a tendency to float or shift during action, causing friction at several points, also tending to cramp during the reciprocatory action and also causing a binding effect against rotation of the reciprocating tool or hammer when such rotation is desirable, all of which resulted in undue wear and frequent replacement of parts.

The primary object of the present invention is to rigidly secure the cushion to the underside of the helve so that the helve and the cushion will move as a unit and the friction and impact incident to striking the reciprocating tool or hammer will be confined to the lower face of the cushion and the friction thereby reduced to a minimum and thus materially prolong the life of the resilient cushion.

Another object of the invention is to provide a cushion assembly adapted to eliminate the necessity of holding close tolerance in the matter of the length of the ram strap and critical adjustments of the helve.

Another object of the invention is to provide a cushion assembly which will enable a cushion consisting of a solid block of resilient material to be employed instead of a tubular cushion and thereby provide a greater volume of material in the given space occupied by the cushion.

It is a further object of the invention to eliminate the stem, tube or other retaining member heretofore employed on the upper end of the reciprocating tool or hammer, thereby reducing the cost and simplifying the manufacture and at the same time enabling a smooth surface to be provided at the upper face on top of the hammer

which comes in contact with the lower face of the cushion when the helve is in action.

Furthermore, the invention has for its object to provide a cushion assembly in which the cushion is rigidly secured to the helve independent of the means for connecting the reciprocating tool or hammer with the helve and thereby relieve the hammer of the binding effect against the rubber to which it has heretofore been subjected and enable the hammer to rotate more freely when such rotation is desired which in turn lessens the burden on the teeth of the gear and worm which rotate the hammer, and at the same time reduce the power consumption.

Also, it is an object of the invention to eliminate the necessity of disassembling the helve by removing the connection of the same with the reciprocating tool or hammer in order to replace the cushion.

With these and other objects in view, the invention consists in the novel construction, combination and arrangements of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Figure 1 is a side elevation of a helve hammer constructed in accordance with this invention.

Figure 2 is an end elevation of the cushion assembly shown in Figure 1.

Figure 3 is a detail side elevation of a portion of the helve illustrating another manner of securing the cushion to the helve.

Figure 4 is an end elevation of the same.

Figure 5 is a detail side view of the front portion of a helve illustrating another means for securing the cushion to the same.

Figure 6 is an end elevation of the same.

Referring particularly to Figures 1 and 2 of the drawings, 1 designates a power driven helve of the ordinary construction bolted or otherwise secured to a rocker plate 2 which is pivoted at 3 to upwardly extending lugs 4 of an overhanging arm 5 of the frame 6 of the helve hammer. The frame of the helve hammer and the means for mounting the power driven helve are substantially the same as shown and described in the aforesaid patent and a particular description and detail illustration of the frame and the power-actuating means is, therefore, deemed unnecessary.

The helve is provided at its forward end with a

cushion 6^a consisting of a solid block of rubber or other resilient material rigidly secured directly to the lower face of the said helve so that the helve and the cushion move or vibrate as a unit to confine to the lower face 7 of the cushion the friction and impact incident to striking the hammer 8 which reciprocates vertically in the outer end of the overhanging arm as clearly indicated in Figure 1 of the drawings. Various means may be employed for rigidly securing the cushion to the lower face of the helve and in Figures 1 and 2 of the drawings, the cushion is secured to the helve by means of a metal strap 9 which is fitted on the forward or front end of the helve and extends around the front and rear portions of the cushion and rigidly binds the cushion to the helve. The cushion 6^a is provided with front and rear portions 10 which are of less thickness than the intermediate or body portion of the cushion 6^a which intermediate or body portion extends below the reduced extended front and rear portions 10 and presents to the upper face 11 of the hammer its impact face 7 which is preferably convex but a flat or any other shaped lower impact face may, of course, be provided.

The metal strap, which may be constructed of any suitable material, extends over the top and downward at the side faces of the helve and its central portion below the helve is cut away to form front and rear downwardly extending or depending loops 12 which receive and engage the extended front and rear portions 10 of the cushion and firmly and rigidly bind the same to the lower face of the helve. The metallic strap 9, which rigidly secures the cushion 6^a directly to the lower face of the helve, may be tapered at its upper portion as shown or of any other desired configuration and it is detachably secured to the helve by means of a bolt 13 or other suitable fastening device located beyond the flexible strap or yoke 14 which connects the reciprocating hammer with the helve 1. The bolt 13 which extends transversely through the helve and both sides of the metallic strap is adapted to be readily removed to enable the metallic strap and the cushion to be removed from the helve for replacing a worn-out cushion with a new cushion without the necessity of disassembling the helve, hammer and flexible strap or yoke. This will enable a new cushion to be substituted for an old cushion without the loss of time heretofore experienced when it was necessary to remove the helve or wooden member 1 from the rocker arm 2.

The hammer is provided at its upper end with a horizontal peripheral flange 15 forming a circular head at the top of the hammer and a washer 16 of the wall construction is arranged on the upper end of the hammer and interposed between the flange 15 and the bottom portion of the flexible strap or yoke. The flexible strap or yoke is of the usual construction.

In Figures 3 and 4 of the drawings is illustrated another method of rigidly securing a cushion 17 directly to the lower face of the helve 18. The cushion 17 is of substantially the same form as the cushion heretofore described being provided with front and rear extensions 19 of less thickness than the intermediate or body portion of the cushion. The extensions 19 are located at the top portion of the cushion and are rigidly secured to the helve by vertical bolts 20 which pierce the extended portions 19 and the helve midway between the side faces of the helve as clearly illustrated in Figure 4 of the drawings. The bolts 20 are preferably headed at their lower

ends and provided at their upper ends with nuts 21 and transversely disposed metal plates 22 which extend across the lower faces of the extension 19 are interposed between the same and the heads of the bolts. Suitable washers 23 are arranged on the upper portions of the bolts and are interposed between the nuts 21 and the helve which is preferably provided with recesses 24 at its upper face to receive the said washers. This construction will enable the bolts and nuts to be tightened sufficiently to rigidly secure the cushion directly to the lower face of the helve without injuring either the cushion or the helve.

In Figures 5 and 6 of the drawings is illustrated another method of rigidly securing a cushion 25 to the lower face of a helve 26. In this form of the invention, the cushion 25 which consists of a solid block of rubber or other suitable resilient material is vulcanized to a metallic plate 27 which is fitted directly to the lower face of the helve 26. The metallic plate 27 extends in advance and in rear of the cushion and its extended portions 28 are pierced by vertical bolts 29 which also extends through the helve midway between the side faces thereof as clearly illustrated in Figure 6 of the drawings. The bolts 29 which are provided at their lower ends with heads have nuts 30 at their upper threaded ends. The heads of the bolts engage the lower face of the plate 27 at the extended ends thereof and metallic washers 31 are interposed between the nuts and the helve being preferably arranged in recesses 32 in the upper face of the helve. This will enable the cushion to be rigidly secured directly to the lower face of the helve without injury to the cushion or the helve. The cushion in each of the forms of the invention is preferably naturally tapered at its lower portion as shown.

The flexible strap or yoke is of the ordinary construction and it stretches from the circular form shown in Figure 2 of the drawings when the helve moves upwardly. This leaves a slight space between the rubber buffer and the ram or hammer which is struck by the rubber buffer in the downward riveting movement. The rubber buffer receives the rebound of the hammer and the flexible character of the yoke or strap provides the necessary play or movement of the parts incident to the pivotal movement of the helve and the vertical movement of the hammer.

When rotary movement of the hammer is desired it is provided with a worm gear 33 which meshes with an actuating worm 34 operated substantially as shown and described in the aforesaid patent. As any suitable means may, of course, be employed for actuating the worm, further description and illustration thereof are deemed unnecessary. The rigid attachment of the cushion directly to the lower face of the helve independently of the connection between the helve and the hammer relieves the hammer of the binding effect which necessarily results when common means is employed for connecting the hammer, the cushion, and the helve together; and the hammer is permitted to rotate more freely and the burden on the teeth of the worm gear and the worm is reduced and the consumption of power is also materially reduced.

The force of the blows are more uniform as the weight of the cushion is in a fixed position relative to the helve at all times which is not the case in previous constructions. The rigid mounting of the cushion directly on the lower face of the helve also does not affect the using of the

commonly accepted method of strap of yielding material which connects the hammer and the helve and actuates the hammer in the vertical movement thereof.

5 The principal inconvenience heretofore experienced in helve hammers of the type of the present machine has been the replacing of a worn-out cushion or buffer.

10 It has been found by experience that the tubular rubber cushion or buffer when the same is subjected to a destructive test will break down and will be destroyed in twenty-seven (27) minutes or less. With the solid rubber buffer or cushion of the present invention, it has also been
15 found by experience that with exactly the same kind of rubber material, the solid rubber cushion or buffer, with the same destructive test, will last more than sixty (60) minutes, which is a very material increase in the length of the life of the
20 buffer or cushion. The rubber buffer or cushion is not only increased in the length of its life by the improvement of the present invention, but the operation is rendered much steadier and is stabilized also. When it becomes necessary to
25 replace the solid rubber buffer, it may be done more easily and quickly than heretofore for the reason that the solid rubber buffer being secured to the helve independently of the means for connecting the ram or hammer with the helve, may
30 be removed without disassembling the helve and hammer and the flexible connecting strap or yoke.

What is claimed is:—

35 1. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a solid block of resilient material located at the under side of the helve and presenting a lower
40 impact face to the hammer, means for rigidly fastening the cushion directly to the helve at the under side thereof to cause both of such parts to move as a unit and confine to the lower face of the cushion the friction and impact incident to striking the hammer, and separate means for
45 connecting the hammer with the helve permitting relative movement to allow for the simultaneous reciprocating and pivotal movements of the hammer and the helve respectively.

50 2. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a solid block of resilient material located at the under side of the helve and presenting a lower
55 impact face to the hammer, means for rigidly fastening the cushion directly to the helve at the under side thereof to cause both of such parts to move as a unit and confine to the lower face of the cushion the friction and impact incident to striking the hammer, said cushion fastening
60 means comprising a metal strap binding the cushion to the helve and exposing a portion of the cushion for contact with the hammer, and separate means for connecting the hammer with the helve permitting relative movement to allow
65 for the simultaneous reciprocating and pivotal movements of the hammer and the helve.

70 3. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a solid block of resilient material located at the under side of the helve and presenting a lower
75 impact face to the hammer, means for rigidly fastening the cushion directly to the helve at the under side thereof to cause both of such parts to move as a unit and confine to the lower face

of the cushion the friction and impact incident to striking the hammer, said cushion fastening means comprising a metal strap binding the cushion to the helve and having an opening in its lower portion through which the cushion projects
80 for engaging the hammer.

4. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a solid block of resilient material located at the under side of the helve and presenting a lower
85 impact face to the hammer, means for rigidly fastening the cushion directly to the helve at the under side thereof to cause both of such parts to move as a unit and confine to the lower face of the cushion the friction and impact incident to striking the hammer, said cushion fastening
90 means comprising a metal strap binding the cushion to the helve and having its lower portion cut away at the center to form front and rear loops receiving portions of the cushion and permitting the intermediate portion of the cushion to project beyond the metal strap for contact with the hammer.

5. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a solid block of resilient material fitted directly against the under side of the helve, means for rigidly fastening the cushion directly to the
100 helve to cause both of such parts to move as a unit and confine to the lower face of the cushion the friction and impact incident to striking the hammer, and separate means for connecting the hammer with the helve permitting limited relative
105 movement to allow for the simultaneous reciprocating and pivotal movements of the hammer and the helve.

6. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of resilient material fitted directly against the under side of the helve, and having front and rear portions of less thickness than the intermediate portion, means engaging the said front and rear portions of the cushion for rigidly securing the same to the helve, and separate means for connecting the hammer with the helve for permitting relative movement to allow for the simultaneous reciprocating and pivotal movements of the hammer and the helve.

7. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of resilient material fitted directly against the under side of the helve and having front and rear portions of less thickness than the intermediate portion, a metal strap fitted on the helve and having front and rear loops extending downwardly from the helve and receiving and engaging the said front and rear portions of the cushion for rigidly securing the cushion to the helve for causing both of such parts to move as a unit and confine to the lower face of the cushion the friction and impact incident to striking the hammer, and separate means for connecting the hammer with the helve.

8. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of resilient material fitted directly against the under side of the helve and having front and rear portions of less thickness than the intermediate portion, fastening devices piercing the helve and the front and rear portions of the
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cushion for rigidly securing the cushion to the helve, and separate means for connecting the hammer with the helve permitting relative movement to allow for the simultaneous reciprocating and pivotal movements of the hammer and the helve.

9. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of resilient material located at the under side of the helve and presenting a lower impact face to the hammer, means for fastening the cushion directly to the helve comprising a plate vulcanized to the cushion, and rigidly secured to the helve, and separate means for connecting the hammer with the helve permitting relative movement to allow for the simultaneous reciprocating and pivotal movements of the hammer and the helve.

10. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of resilient material located at the under side of the helve and presenting a lower impact face to the hammer, means for rigidly fastening the cushion to the helve comprising a plate vulcanized to the cushion and extending in advance and in rear of the same, and fastening means for rigidly securing the extended portions of the plate to the helve, and separate means for connecting the hammer with the helve permitting relative movement to allow for the simultaneous reciprocating and pivotal movements of the hammer and the helve.

11. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of rubber located at the under side of the helve and presenting a lower impact face to the hammer, means for rigidly securing the cushion directly to the helve to cause both of such parts to move as a unit and confine to the lower face of the cushion the friction and impact incident to striking the hammer, said cushion fastening means including a plate vulcanized to the rubber and a fastening device piercing the plate

and the helve beyond the cushion, and flexible means separate from the said cushion fastening means for connecting the hammer with the helve.

12. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of rubber, means for rigidly securing the block of rubber directly to the under side of the helve and flexible means separate from the cushion fastening means for connecting the hammer with the helve, said cushion fastening means being constructed and arranged to permit the cushion to be removed and replaced without disconnecting the hammer and the helve.

13. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of resilient material rigidly secured to the underside of the helve to move with the same as a unit, said cushion being provided with a convex lower impact face for contact with the hammer, and separate flexible means for connecting the hammer with the helve.

14. In a helve hammer, the combination with a power driven pivotally mounted helve, and a reciprocating hammer, of a cushion consisting of a block of resilient material rigidly secured to the underside of the helve to move with the same as a unit, said cushion being provided with a convex lower impact face for contact with the hammer, and the hammer being provided with a flat top surface to be engaged by the cushion, and separate flexible means for connecting the hammer with the helve.

15. In a helve hammer, the combination with a power driven pivotally mounted helve, of a reciprocating hammer having a flat top face, a cushion consisting of a block of resilient material rigidly secured directly to the underside of the helve to move with the same as a unit, said cushion having a lower impact face for engaging the flat top face of the hammer, and separate flexible means for connecting the hammer with the helve.

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