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2,184,745

CUSHION FOR PILE DRIVING

Filed May 10, 1938

FIG. 1.

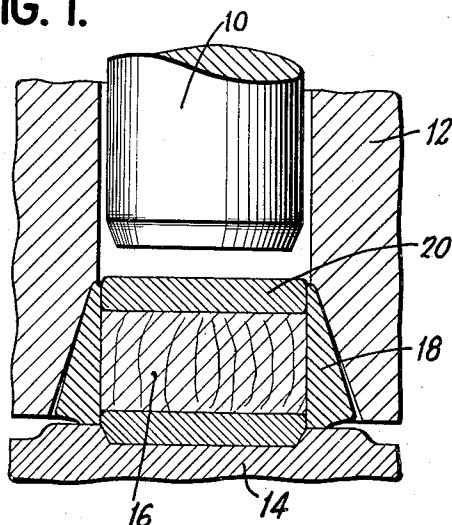


FIG. 2.

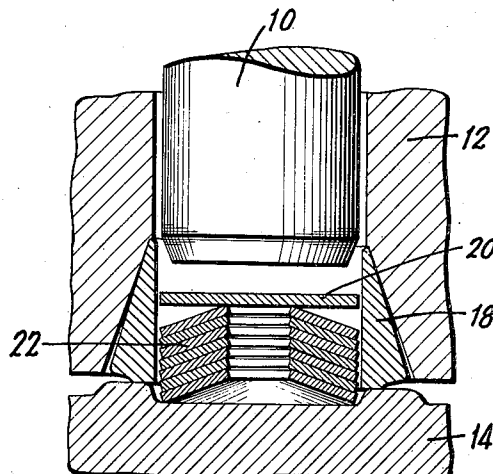


FIG. 3.

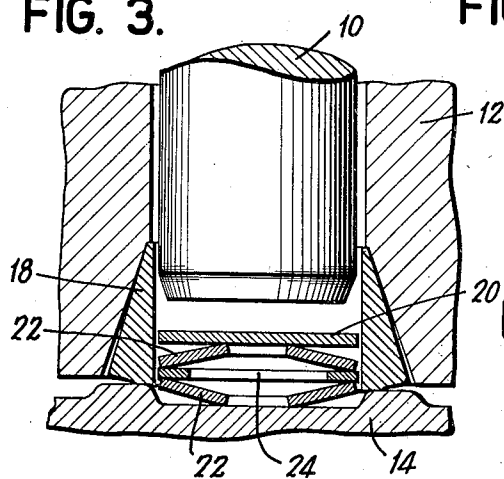


FIG. 5.

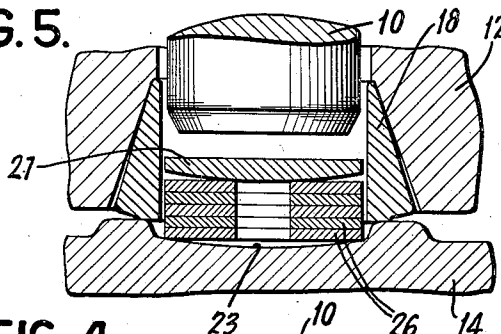


FIG. 4.

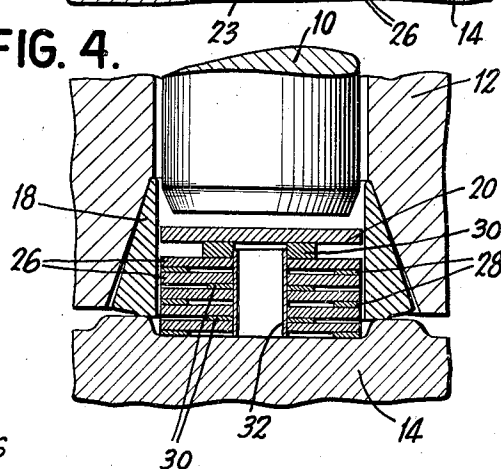
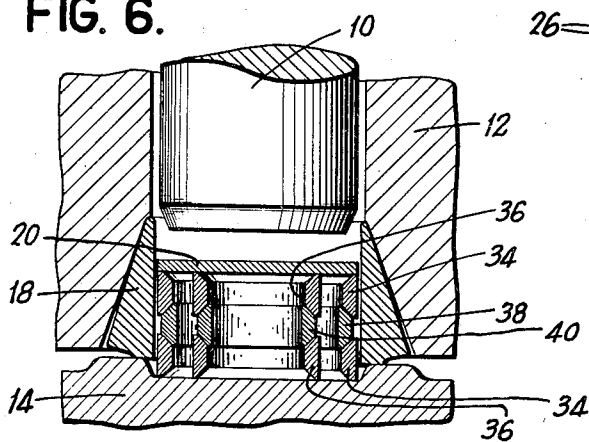


FIG. 6.



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CUSHION FOR PILE DRIVING

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Application May 10, 1938, Serial No. 206,977

5 Claims. (Cl. 61—77)

In the operation of driving piles it is sometimes necessary to use a cushion between the hammer and the pile follower or drive cap for the purpose of preventing injury to parts of the apparatus due to the impact of the hammer.

For that purpose it has been customary to use a hard wood cushion between the hammer and follower. The cushion is placed with the grain of the wood vertical. These blocks of wood are hard to obtain and are costly to use because one block serves for only a few piles and then must be replaced. The replacing job requires several minutes and delays the whole driving operation by that amount each time a block is replaced.

An object of the present invention is to provide a cushion which is much more durable in service than the wood block.

Another object is to provide a resilient cushion which will convert much of the hammer blow into a push or thrust, thereby conserving energy and reducing wear and tear on the apparatus.

The invention contemplates the use of spring metal, usually in the form of disks, or rings, arranged in the space available between the hammer and follower, said space being very restricted vertically and horizontally.

Another object is to provide a cushion of which the carrying capacity can be measured or calculated, and which remains constant in use.

Further and other objects and advantages will be apparent from the specification and claims, and from the accompanying drawing which illustrates what is now considered the preferred embodiment of the invention.

Fig. 1 shows the conventional arrangement of wood block between hammer and follower.

Fig. 2 shows the same parts of the apparatus as Fig. 1, but with the wood block replaced by a cushion according to the present invention.

Figs. 3, 4, 5 and 6 are detail views of other forms of the invention.

In Fig. 1 of the drawing, 10 is the hammer, 12 the hammer base, 14 the follower, 16 the wood block, 18 the enclosing ring for the block, and 20 is the top plate.

In Fig. 2 the wood block 16 has been replaced by a cushion comprising a stack of dished ring-like spring disks 22 in nested relationship. These nested disks under the impact of the hammer flatten out momentarily and then restore themselves to normal shape by pushing upwardly on the hammer and downwardly on the follower. The dimensions and number of disks may be varied as circumstances require.

Fig. 3 shows a modified form of cushion with

a pair of opposed disks 22 having a bearing ring 24 between them.

Fig. 4 shows a modification in which the cushion disk rings 26 are normally flat, and are dished only momentarily under impact of the hammer. Each disk is spaced from adjacent disks by spacer rings 28 at the outer circumference of the disks or by rings 30 at the inner disk circumference. A tube 32 keeps rings 30 in operative position.

Fig. 5 shows a modification of the disk arrangement of Fig. 4 in which rings 28 and 30 are omitted, and top plate 20 is replaced by a plate 21 having a convex lower surface. Also, the upper surface of follower 14 is recessed as at 23.

Fig. 6 shows an embodiment in which the disks are replaced by spring rings having interrelated conical surfaces so arranged that some of the rings are expanded radially, while others are compressed radially under the hammer, all of them returning to normal after momentary deformation. Rings 34 and 36 are expanded, while rings 38 and 40 are compressed under the hammer blow.

It is to be understood that the invention is not limited to the specific embodiment herein illustrated and described, but may be used in other ways without departure from its spirit as defined by the following claims.

I claim:

1. Apparatus for driving a pile, comprising in combination, a hammer, a cushion comprising a spring disk, and means for holding said cushion in operative position below said hammer, for the purpose set forth.

2. The invention set forth in claim 1 in which said cushion comprises a plurality of nested dished disks.

3. The invention set forth in claim 1 in which said cushion comprises a flat disk interposed between means cooperating with said disk to dish the same under action of said hammer.

4. The invention set forth in claim 1 in which said cushion comprises a plurality of superimposed flat disks interposed between the convex surface of one member and a recessed surface of another member and adapted to be dished under action of said hammer.

5. The invention set forth in claim 1 in which said cushion comprises a plurality of flat disks having spacer rings between adjacent disks, whereby said disks are dished under action of said hammer.

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