No. 873,517. PATENTED DEC. 10, 1907.

C. C. DE WITT.

COMPRESSED AIR CUSHION BLOCK FOR PILING.

APPLICATION FILED JULY 15, 1907.

FIG. 1.

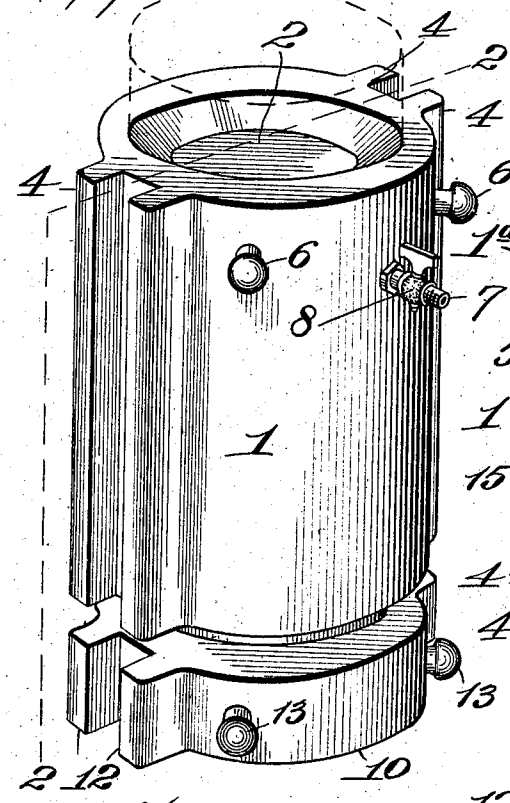


FIG. 2.

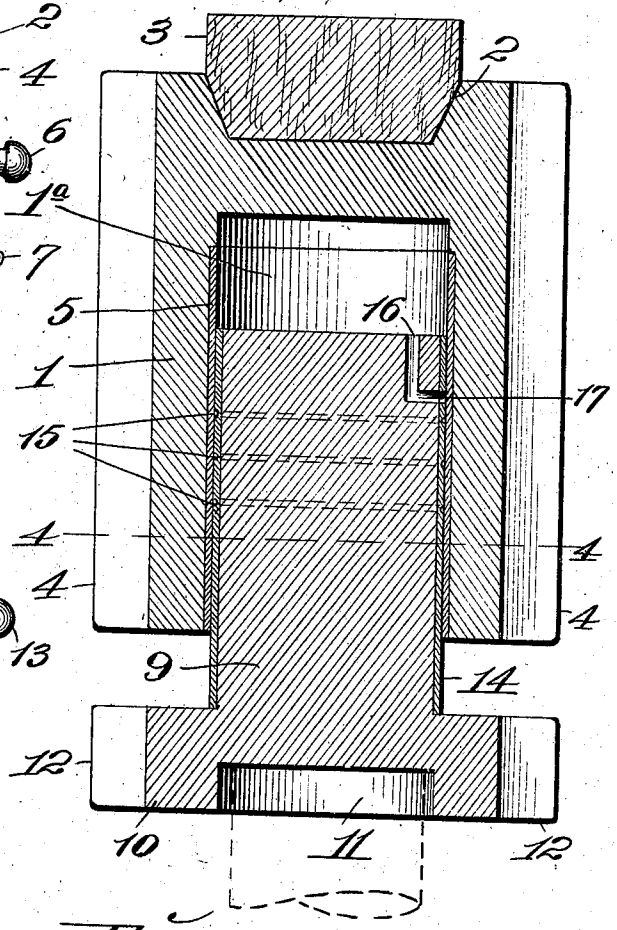


FIG. 3.

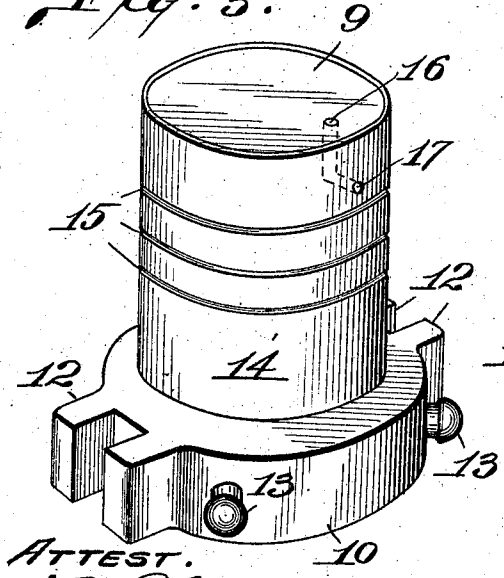
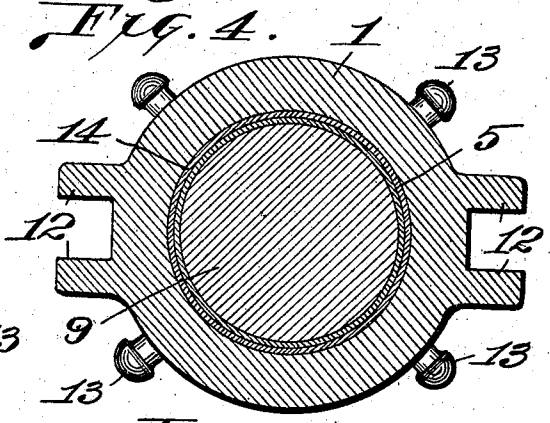


FIG. 4.



ATTEST.

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UNITED STATES PATENT OFFICE.

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COMPRESSED-AIR-CUSHION BLOCK FOR PILING.

No. 873,517. Specification of Letters Patent. Patented Dec. 10, 1907.

Application filed July 15, 1907. Serial No. 383,728.

To all whom it may concern:

Be it known that I, CLINTON C. DE WITT, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Compressed-Air-Cushion Blocks for Piling, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a compressed air cushion block utilized on the upper end of concrete piling when the same is being driven into the ground, and the object of my invention is to construct a two-part block in which is formed a chamber which receives air, and which latter is compressed as the upper part of the block moves downward when struck by the hammer of the pile driver, thus forming a pneumatic cushion on the upper end of the piling, and which does away with the breakage of the piling at the upper end thereof where the same is directly engaged by the hammer of the pile driver.

To the above purposes, my invention consists in certain novel features of construction and arrangement of parts, which will be hereinafter more fully set forth, pointed out in the claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of a cushion block of my improved construction; Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1; Fig. 3 is a perspective view of the lower member of the cushion block; Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 2.

Referring by numerals to the accompanying drawings:—1 designates the upper member of the block, which is in the form of a hollow cylinder, with the upper end being closed, and there being a recess 2 formed in the top of this member, and which recess is adapted to receive a wooden block 3, which acts as an anvil or striking surface for the hammer of the pile driver.

Formed integral with the body of the member 1, on opposite sides thereof, are the vertically disposed pairs of flanges 4, which perform the function of guides and engage the vertically disposed uprights of the pile driver frame. Fitted on the interior of the member 1 is a lining or bushing 5, of brass, or analogous material, which provides a perfectly smooth bearing surface on the interior of said member. Formed integral with the member 1, adjacent the upper end thereof, are lugs 6, which are utilized in hoisting the block into position for use, and passing through the wall of the member 1, and communicating with the air chamber 1^a on the interior thereof is a short pipe, or nipple 7, in which is located a valve 8, said pipe providing means whereby air may be delivered to or allowed to discharge from the air chamber.

The lower or piston member 9 of the block is of cylindrical form, and provided at its lower end with an integral flange 10, in the under side of which is formed a recess 11, adapted to receive the upper end of the piling; and formed on opposite sides of this flange 10 are the vertically disposed pairs of guides 12, which, when in use, are alined with the guides 4 and bear on the uprights of the pile driver frame. Formed integral with the outer face of the flange 10 are lugs 13, similar to the lugs 6, and which are utilized when the block is being hoisted into position for use.

The exterior of the block 9 is provided with a shell or bushing 14, of brass or analogous material, which fits snugly within the bushing 5, and the parts are so constructed as that an air tight joint is formed between the bushing 5 and shell 14, thus preventing the escape of air from the chamber 1^a when the apparatus is in use.

Formed in the periphery of the shell 14 is a series of horizontally disposed shallow grooves 15, which may be filled with a suitable liquid, and thus act as a seal or packing to prevent the escape of air from the interior of the block; or, if desired, suitable packing rings may be embedded in the surface of the shell 14.

Formed in the upper end of the block 9 is a vertically disposed passageway 16, which communicates at its lower end with a horizontally disposed passageway 17, thus forming a relief vent to permit the escape of air from the interior of the block, should the member 1 at any time be elevated to such a degree by the over pumping of air into the chamber 1^a as to expose the passageway 17.

When my improved block is positioned for use, the two parts thereof are fitted together and arranged between the vertical guides of the pile driver frame, and the air trapped in the chamber 1^a forms a suitable pneumatic cushion when compressed by the hammer of the pile driver in striking the

block 3. By opening the valve 8 and allowing a portion of the air trapped in the chamber 1^a to escape, the normal position of the member 1 upon the member 9 can be accurately regulated. The block 9 is now positioned on top of the pile to be driven, with the upper end of said pile located in the recess 11, and the hammer of the pile driver or steam hammer is now operated in the usual manner. The hammer striking upon the block 3 compresses the air in the chamber 1^a and the cushioning effect obtained by this compression breaks the force of the impact between the lower end of the block 9 and the upper end of the pile, thus preventing the upper portion of the pile from being shattered as a result of the driving blows of the hammer. The member 9 acts the same as a piston within the member 1, and the brass shell 14 operating in the brass bushing 5 slides freely, with little friction; and, as the two parts are fitted accurately, the air under compression cannot escape from the chamber within the member 1. The grooves 15 are adapted to receive liquid, which forms an additional protection to prevent the escape of air; and where oil is made use of in said grooves, the surfaces of the shell 14 and bushing 5 are lubricated. The passageways 16 and 17 form a relief or escape for the air should the member 1 be elevated too far when air is pumped into the chamber 1^a and thus the member 1 cannot be accidentally lifted off the member 9 by over-pumping. The block 3, of wood or analogous material, serves as an anvil or striking surface for the hammer, and thus prevents the upper end of the member 1 from being battered by the successive strokes of the hammer.

A cushion block of my improved construction comprises a minimum number of parts, can be used in connection with an ordinary pile driver or with a steam hammer, and is particularly adapted for use in driving piles constructed of concrete, or of concrete and metal.

I claim:—

1. A cushion block of the class described, comprising a pair of telescoping members, and between which members is formed an air chamber.

2. A cushion block of the class described, comprising a pair of telescoping members, between which members is formed an air chamber, and there being guide grooves formed on the sides of said telescoping members.

3. A cushion block of the class described, comprising a pair of telescoping members, between which members is formed an air chamber, an anvil block carried by the upper one of the telescoping members, and lugs formed integral with each of the members.

4. A cushion block of the class described, comprising a pair of telescoping members, between which members is formed an air chamber, and an anvil block carried by the upper one of the telescoping members.

5. A cushion block, comprising a pair of telescoping members, between which is formed an air chamber, a bushing arranged in the outer one of the members, and a shell arranged on the bearing face of the inner member.

6. A cushion block, comprising a pair of telescoping members, between which is formed an air chamber, a bushing arranged in the outer one of the members, a shell arranged on the bearing face of the inner member, and there being packing grooves formed in the surface of the shell.

7. A cushion block of the class described, comprising a pair of telescoping members, between which members is formed an air chamber, and lugs formed integral with each of the members.

8. A cushion block of the class described, comprising a pair of telescoping members, between which members is formed an air chamber, an anvil block carried by the upper one of the telescoping members, and there being a recess formed in the under side of the lower member.

9. A cushion block of the class described, comprising a pair of telescoping members, between which members is formed an air chamber, and means whereby air is delivered to and discharged from the air chamber.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

CLINTON C. DE WITT.

Witnesses:
M. P. SMITH,
E. L. WALLACE.