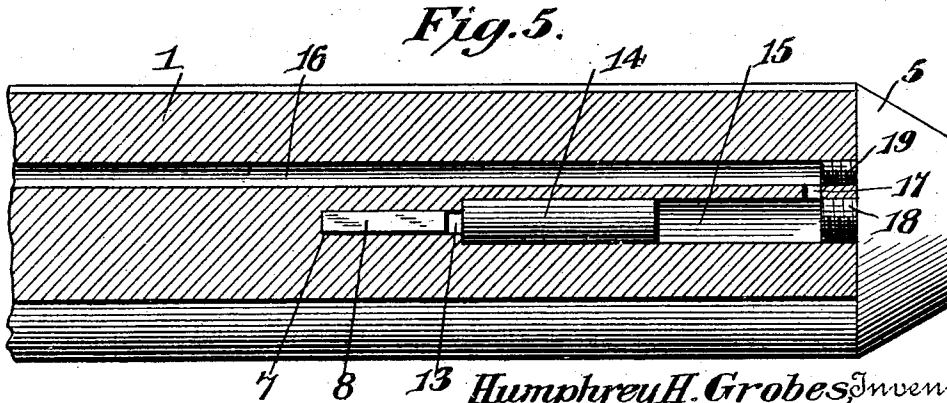
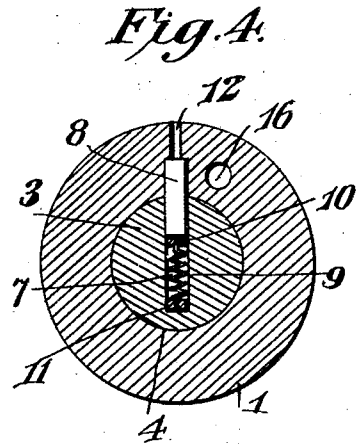
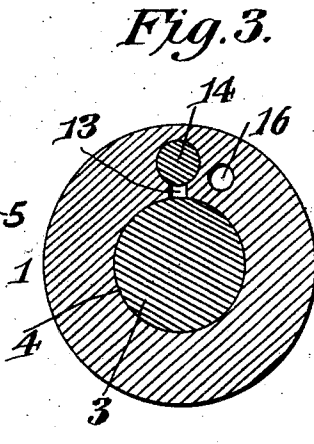
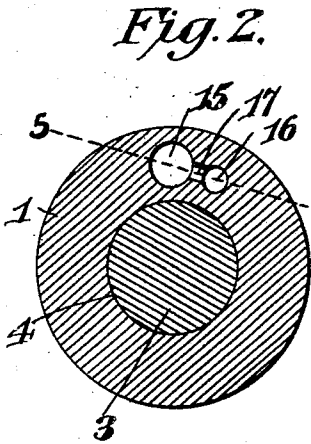
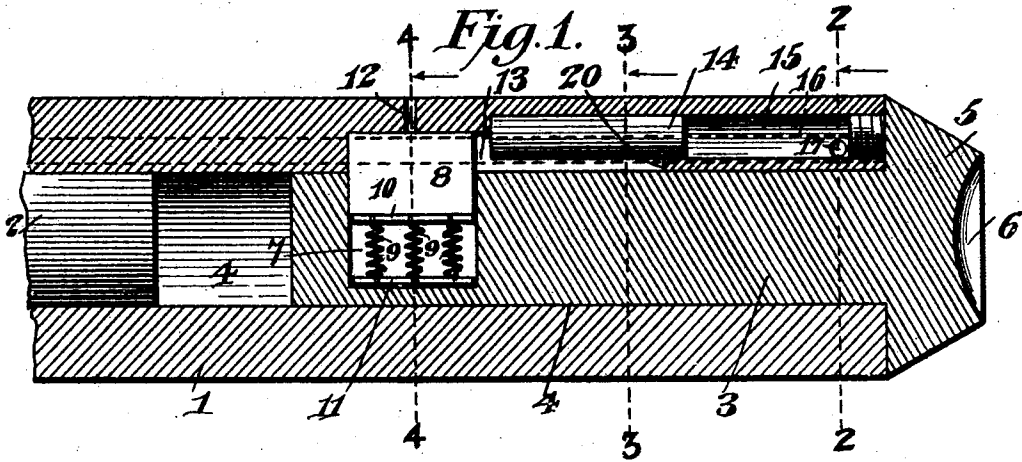


H. H. GROBES.
PNEUMATIC HAMMER.
APPLICATION FILED MAR. 31, 1908.

939,828.

Patented Nov. 9, 1909.



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PNEUMATIC HAMMER.

939,828.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed March 31, 1908. Serial No. 424,357.

To all whom it may concern:

Be it known that I, HUMPHREY H. GROBES, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Pneumatic Hammer, of which the following is a specification.

The invention relates to improvements in pneumatic hammers.

Heretofore considerable difficulty has been experienced in retaining the bit or rivet engaging member of a pneumatic hammer in the barrel or casing, and frequent loss of such part and the resulting inconvenience have been experienced, especially when working on bridges or high buildings, and more or less danger results from the use of such tools on high buildings, as the bit or engaging member, when it falls, attains considerable force before reaching the ground.

The object of the present invention is to improve the construction of pneumatic hammers, and to provide simple and efficient means adapted, without impairing the effectiveness of the blow of the pneumatic hammer, to prevent the bit or engaging member from being fired or driven out of the barrel or casing by the action of the hammer.

A further object of the invention is to provide a device of this character, adapted to permit the ready removal of the bit or engaging member, when it is desired to change or detach the same for any other purpose.

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

In the drawing:—Figure 1 is a longitudinal sectional view of the outer portion of a pneumatic hammer, constructed in accordance with this invention. Fig. 2 is a transverse sectional view on the line 2—2 of Fig. 1. Fig. 3 is a similar view on the line 3—3 of Fig. 1. Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1. Fig. 5 is a longitudinal sectional view on the line 5—5 of Fig. 2.

Like numerals of reference designate corresponding parts in all the figures of the drawing.

1 designates the barrel or casing of a pneumatic hammer, which in practice is equipped with a reciprocatory plunger 2 and means for pneumatically actuating the same, but as the particular construction of the plunger and the operating mechanism therefor do not constitute any portion of the present invention, and as the improvements herein shown and described are applicable to various forms of pneumatic hammers, a detail description and illustration of the plunger and the operating mechanism are deemed unnecessary. The pneumatic hammer is equipped with the usual bit or engaging member 3, having a round shank or stem to fit into the opening 4 of the barrel or casing 1 and provided at its outer end with a head 5, having a concave rivet-engaging face 6, but any other form of bit or engaging member may be substituted for that illustrated in the drawing, as will be readily understood. The bit or engaging member is provided with a diametrically arranged recess 7, located adjacent to the inner end of the bit or engaging member 3, and extending inwardly from one side of the shank or stem and terminating short of the opposite side. The recess may be arranged either vertically or horizontally, or in any other position, as its arrangement does not affect the operation of the locking device 8 for limiting the movement of the bit or engaging member and for retaining the same in the barrel or casing. The locking device 8 consists of a block or piece, adapted to be forced entirely within the recess 7 to permit the bit or engaging member to be introduced into and removed from the barrel or casing 1 and normally held at the limit of its outward movement by yieldable means, consisting of a plurality of coiled springs 9, connected at their terminals to strips or plates 10 and 11 and interposed between the block or piece 8 and the inner end wall of the recess 7. The plates 10 and 11 fit against the inner edge or face of the block or piece 8 and the inner wall of the recess 7, as clearly shown in Fig. 1 of the drawings. The block or piece 8 is compressed within the recess in introducing the bit or engaging member into the opening 4 of the barrel or casing 1, and the barrel or casing is provided with a transverse perfo-

ration 12, adapted to receive a pin, or other tool for enabling the block to be forced out of a longitudinal groove or way 13 of the casing or barrel 1, and into the recess 7 to permit the removal of the bit or engaging member. In removing the bit or engaging member, the block or piece 8 is forced into the recess, and the said bit or member is partially rotated to carry the said block or piece beyond the plane of the groove or way 13, whereby the block or piece is maintained out of engagement with the groove 13 of the barrel or casing to permit the removal of the bit or engaging member. The groove or way 13, which is in the inner face of the barrel or casing 1, provides inner and outer end walls, and when the block or piece extends into the groove or way, it is impossible for the bit or engaging member to fall out of or be fired from the barrel or casing. The head of the bit or member by engaging the outer end of the barrel or casing, as shown in Fig. 1 of the drawings, relieves the locking device of strain by limiting the inward movement of the bit or member, so that the locking device will not come in contact with the inner end wall of the groove or way with sufficient force to be injured by such contact.

In order to prevent injury to the locking device by the outward movement of the bit or engaging member, especially when the pneumatic hammer is operated and the bit or member is not in engagement with a rivet or other surface, a cushion is located in the path of the locking device and limits the outward movement thereof. This cushion consists in a pneumatically cushioned plunger 14, operating in a cylindrical chamber 15, extending longitudinally of the barrel or casing 1 and formed by a bore or opening in the wall thereof. The cylindrical chamber extends into and overlaps the groove or way, and when the bit or engaging member moves outwardly from its innermost position, illustrated in Fig. 1 of the drawings, the locking device comes in contact with the inner end of the pneumatically cushioned plunger 14, and a yielding cushioning resistance is offered to the outward movement of the bit or engaging member, and the force moving the bit or engaging member outward is gradually absorbed by the pneumatic cushion, so that injury is thereby prevented. The locking device is spaced from the inner end of the pneumatically cushioned plunger when the bit or engaging member is at the limit of its inward movement, so that the pneumatic cushion does not interfere with or affect the force of the blow of the pneumatic hammer, when the latter is operating on a rivet or other surface.

Air under pressure is introduced into the chamber 15 from an air passage 16, communicating with the outer ends of the cham-

ber 15 and a transverse port 17. The air passage 16 extends through the pneumatic hammer and communicates with the source of supply, so that a constant pressure, independent of the operating mechanism of the pneumatic hammer, is maintained in the passage and in the chamber, when the hammer is coupled to the supply pipe or feeder (not shown). The outer ends of the chamber 15 and the passage 16 are closed by screw plugs 18 and 19, or other suitable means, and the pneumatically cushioned plunger is of a length to extend from the plug 18 to the outer end wall 20 of the groove or way 13, so that when the device is uncoupled and there is not pressure in the chamber 15, the outward movement of the bit or engaging member, incident to carrying the pneumatic hammer in an inverted position, will not drive the plunger 14 into contact with the plug 18 with force sufficient to injure the threads of the plug, or the barrel or casing. Should the pneumatic hammer be discharged when the bit or engaging member is not in engagement with a rivet or other surface, and the said bit or engaging member is thrown outward by the reciprocatory plunger 2 of the hammer, the said bit or engaging member will be moved back into the barrel or casing by the pneumatically cushioned plunger, after the force of the blow has been expended and absorbed by the cushion. The outer end of the pneumatically cushioned and actuated plunger 14 has an air tight fit within the cylindrical chamber 15 to prevent leakage of air from the chamber 15 into the groove or way.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A pneumatic tool including a casing, a bit or engaging member, a locking device extending from the bit or member to the casing for retaining the former in the latter, and a pneumatically actuated plunger mounted in one of the walls of the casing and arranged in the path of the said device for cushioning the same.

2. A pneumatic tool including a casing provided in its walls with a chamber and having an air passage communicating with the chamber at the outer portion thereof for maintaining a constant pressure within the said chamber, a plunger operating in the said chamber and normally held at the limit of its inward movement by the said pressure, a bit or engaging member, and means carried by the bit or engaging member and arranged to engage the plunger.

3. A pneumatic tool including a casing, a bit or engaging member, an interior locking device mounted on one of the parts and arranged to engage the other, a plunger mounted on the part engaged by the said

device and arranged in the path of the same, and means for maintaining a constant pressure of air on the plunger to cushion the said device.

5 4. A pneumatic tool including a casing provided with an interior way extending longitudinally of the casing, the latter being also provided with a chamber extending along and communicating with a portion
10 of said way, a bit or engaging member, a device projecting from the bit or engaging member and movable in the said way, and a pneumatically cushioned plunger operating in the said chamber and located in the
15 path of the said device.

5 5. A pneumatic tool including a casing having an interior longitudinal way, a bit or engaging member provided with a recess, a block extending from the recess and operating in the way for preventing the bit or
20 engaging member from leaving the casing, and a yieldable device also arranged in the recess and holding the block in an extended position, said device being composed of

inner and outer plates, and a plurality of 25 springs interposed between and connected with the plates.

6. A pneumatic tool including a casing provided in its interior with a longitudinal way and having a longitudinal chamber 30 overlapping the said way, said casing being also provided with an air passage communicating with the outer portion of the chamber, a plunger operating in the chamber, a bit or member having a recess, a locking 35 block extending from the recess into the longitudinal way and arranged to engage the said plunger, and a plurality of springs arranged within the recess for holding the block in an extended position. 40

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HUMPHREY H. GROBES.

Witnesses:

HOWARD BAILEY,
LOUISA GROBES.