Nov. 7, 1950 J. J. MOHR 2,528,702

HAMMER RETAINER MEANS FOR MACHINE TOOLS

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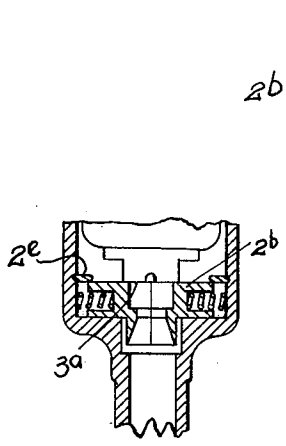


FIG. 6

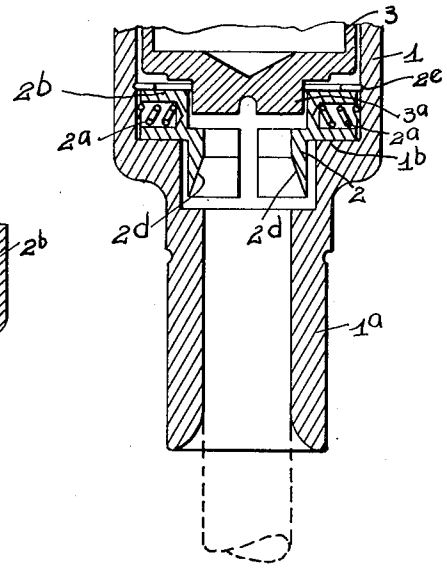


FIG. 1

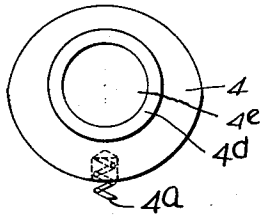


FIG. 4.

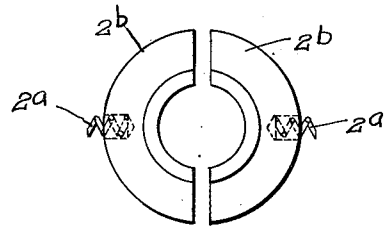


FIG. 2

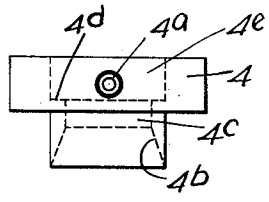


FIG. 5.

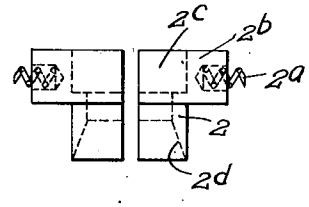


FIG. 3.

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HAMMER RETAINER MEANS FOR MACHINE TOOLS

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10 Claims. (Cl. 125—33)

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My invention relates to a cushioning means for automatic hammers and the objects of my invention are:

First, to provide a cushioning means for the hammer member in automatic and similar hammers which will cushion, limit or stop the reciprocating movement of the hammer;

Second, to provide such a device which will automatically carry out its function and adjust itself when the tool used with the hammer is inserted and removed;

Third, to provide such a device whereby control of the hammer member is obtained without making the insertion of the tool at all difficult, the cushioning or locking of the hammer preventing harm to the hammer when the power is left on the device when the tool is removed;

Fourth, to provide a device of this class which is very simple and practicable to manufacture, efficient in use, and which is sturdy and durable and will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a fragmentary vertical sectional view of my hammer cushioning device operatively associated with a hammer member in a machine tool with a bit, indicated in dash line, inserted in the machine tool in operative position; Fig. 2 is a top plan view of the split cushion and springs; Fig. 3 is a side elevational view of the split cushion and springs; Fig. 4 is a plan view of a modification of my cushion which is not split but which has the bevelled hole for the bit eccentrically positioned; Fig. 5 is a side elevational view of the modification shown in Fig. 4; and Fig. 6 is a fragmentary sectional view showing the cushion in operative blocking position.

Similar characters of reference refer to similar or identical parts and portions throughout the several views of the drawings:

The machine tool casing 1, split retainer 2, hammer 3, and modification cushion 4 constitute

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the principal parts and portions of my invention.

In the drawings, I have represented a portion of a machine tool of the hammer type, either operated pneumatically or of the rotary type, the machine tool casing 1 being of stepped cylindrical shape, the internal step being right angular with one surface 1*b*, shown horizontal in Fig. 1, being polished. The smaller cylindrical portion 1*a* of the casing is adapted to receive and guide a bit shown in dash line in Fig. 1, which bit in operative position extends up into the split retainer 2 holding the two halves of the split retainer apart, as shown in Fig. 1, against the pressure of the springs 2*a* compressed between the side of the casing and the retainer 2, the ends of the springs being inserted into holes drilled into the sides of the upper portion 2*b* of the retainer. This upper portion 2*b* constitutes a semi-circular flange around a recess 2*c* as shown in Fig. 3.

To facilitate the insertion of the bit into the retainer 2 this retainer has an interiorly bevelled cylindrical portion 2*d*, the outer diametric dimension of the assembled halves being less than the interior diameter of the juxtaposed stepped portion of the casing. When the bit is inserted, the two halves of the retainer slide outwardly to admit the bit and the lower surface of the portions 2*b* slides on the polished surface 1*b* of the casing. The bevelled portions 2*d* of the retainer and the diametric dimension of the recess 2*c*, measured when the two halves of the retainer are held apart by the tool, should be so proportioned that a small clearance is provided between the sides of this recess 2*c* and the percussion face plate 3*a* of the hammer 3.

The shoulders 2*b* on each half of the split retainer limit the downward movement of the hammer and limits the hammer stroke. The dimensional depth of the recess 2*c*, Fig. 3, is made just slightly more than the travel of the hammer. When the tool is removed the springs 2*a* press the two halves of the split retainer together underneath the percussion face plate 3*a* while the hammer is in upward or withdrawn position, thus preventing the reciprocation of the hammer from continuing, as shown in Fig. 6. A split ring 2*e* is inserted in a suitable groove in the casing 1 to keep said retainer in place as indicated in Figs. 1 and 6.

A modification of my invention is illustrated in

Figs. 4 and 5. This is a retainer 4 which is in one piece with one spring 4*a* replacing the springs 2*a* of the split cushion. A hollow cylindrical interiorly bevelled portion 4*b* corresponds with the part 2*d* of the split retainer except that in the modified form the hole 4*c*, shoulder 4*d* and bevelled portion 4*b*, all concentric with each other, are eccentric from the central axis of the upper portion 4. When the tool is inserted the bevelled portion 4*b* is engaged on one side thereof and pushed laterally against pressure of the spring 4*a* along the polished surface 1*b* of the casing until the hole 4*c* registers with the end of the tool being inserted and the tool can then enter the hole 4*e* and make operative contact with the percussion face plate 3*a* of the hammer and at the same time the circular recess 4*e*, which is made slightly larger than the hammer percussion plate 3*a*, is made to register with the said plate 3*a* and the hammer is made free to reciprocate.

In use, the insertion of the tool automatically disengages the retainer, whether of split form as at 2 or single as at 4, from jamming relationship with said hammer plate 3*a*, and on withdrawal of the tool the retainer adjusts itself under pressure of the laterally disposed springs 2*a* or spring 2, under a portion of the hammer plate 3*a*, locking the same.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the append claims.

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

1. In an automatic machine tool having a reciprocating hammer within a casing and a removable tool, a hammer retainer means including an internal shoulder in said casing, a block laterally slidably mounted on said shoulder and having a recess adapted to receive an end portion of said reciprocating hammer and a bevelled recess to receive an end portion of said removable tool when same is inserted in operative position, such insertion forcing said block to slide on said shoulder and causing the first mentioned recess to register with said end portion of the hammer, a spring compressed between said casing and said block and adapted to move said block so that the first mentioned recess will not register with said end portion of the hammer when said tool is withdrawn from said bevelled recess.

2. In an automatic machine tool having a reciprocating hammer within a casing and a removable tool, a hammer retainer means including an internal shoulder in said casing, a block laterally slidably mounted on said shoulder engageable with said removable tool and spring loaded to move into blocking engagement with said hammer when said removable tool is removed from the machine tool.

3. In an automatic machine tool having a reciprocating hammer within a casing and a removable tool, a hammer retainer means including an internal shoulder in said casing, a block laterally slidably mounted on said shoulder and spring loaded to move into blocking engagement with said hammer when said removable tool is removed from the machine tool, said block having a bevelled surface frictionally engageable with said removable tool.

4. In an automatic machine tool having a reciprocating hammer within a casing and a removable tool, a hammer retainer means including an internal shoulder in said casing, a split block laterally slidably mounted on said shoulder engageable with said removable tool each part of said block being spring loaded to move into blocking engagement with said hammer when said removable tool is removed from the machine tool.

5. In an automatic machine tool having a reciprocating hammer within a casing and a removable tool, a hammer retainer means including an internal shoulder in said casing, a split block laterally slidably mounted on said shoulder each part of said block being spring loaded to move into blocking engagement with said hammer when said removable tool is removed from the machine tool, each part having a bevelled surface frictionally engageable with said removable tool.

6. In an automatic machine tool having a reciprocating hammer within a casing and a removable tool, a hammer retainer means including a split block laterally slidably mounted on an internal shoulder in said casing, a recess in each half of said block to receive an end portion of said hammer, a bevelled surface on said block frictionally engageable with said removable tool to cause insertion of said removable tool to move said block so that said recess is in alignment with said hammer and springs compressed between said casing and an outer edge of each half of said block to move said block so that said recess is not in alignment with said hammer when said removable tool is removed.

7. In an automatic machine tool having a reciprocating hammer within a casing and a removable tool, a hammer retainer means including an internal shouder in said casing, a block laterally slidably mounted on said shoulder and spring loaded to move into blocking engagement with said hammer when said removable tool is removed from the machine tool said block having an eccentrically positioned recess to accommodate an end portion of said hammer and a bevelled hole concentric with said recess to receive said removable tool thus positioning the block so that said recess is in alignment with said hammer.

8. A power operated percussive tool, comprising a reciprocable hammer, a working head secured to said tool, a work-engaging member supported in said head for reciprocable movement in axial alinement with said hammer, a transversely movable block disposed within the head between the hammer and said work-engaging member, resilient means in engagement with said block and normally retaining it in position to prevent contact of the hammer with said work-engaging member, said block and work-engaging member having cooperating means whereby the block may be moved against the tension of said resilient means to establish contact of the hammer with the work-engaging member.

9. A power-operated percussive tool comprising a reciprocable hammer, a working head secured to said tool, a work-engaging member supported in said head for reciprocable movement in axial alinement with said hammer, a transversely movable block disposed within the head between the hammer and said work-engaging member, said block having an opening therethrough for permitting contact of said hammer with the work-engaging member, the forward portion of said opening being tapered, resilient means in engagement with said block and normally retaining it in position to prevent contact of the

hammer with said work-engaging member, said work-engaging member being formed at its rear end for cooperation with the opening in the block thereby to move the block against the tension of said resilient means and establish contact of the hammer with the work-engaging member when the latter is subjected to rearward pressure.

10. A power-operated percussive tool comprising a barrel, a hammer axially displaceable therein, means for reciprocating said hammer in said barrel, a hollow head secured on said barrel, a work-engaging member carried by said head, a transversely moveable block in said head provided

coaxially with an aperture and a tapered socket, said work-engaging member being provided with a portion to co-operate with said socket.

JOSEPH J. MOHR.

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