

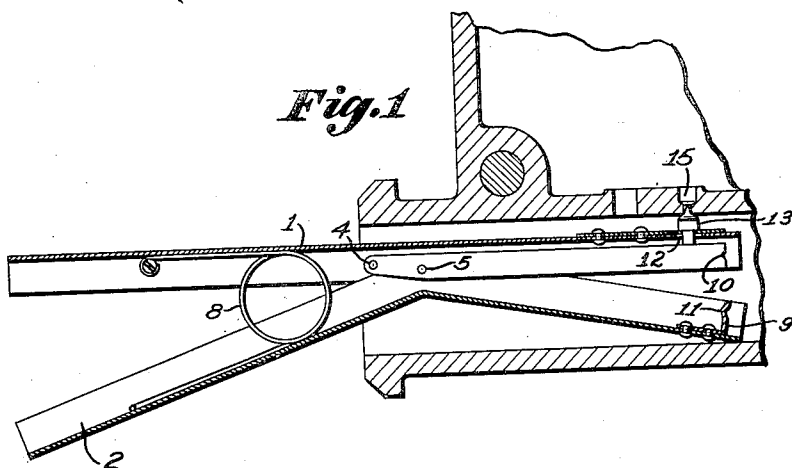
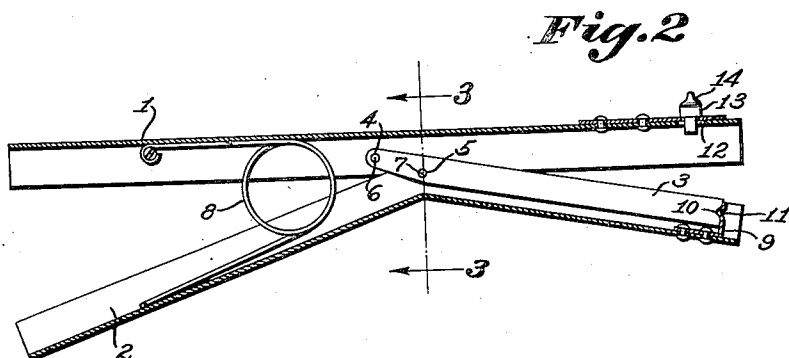
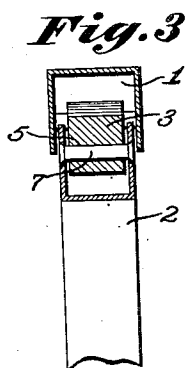
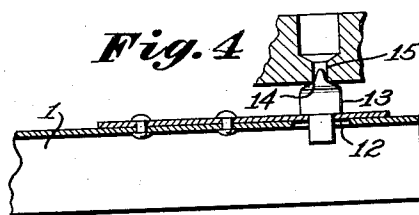
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AUTOMOBILE MASTER BRAKE CYLINDER TOOL

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AUTOMOBILE MASTER BRAKE CYLINDER
TOOL

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11 Claims. (Cl. 78—1)

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This invention relates to hand tools, and more particularly to tools of the trip hammer type for operation in confined areas not readily accessible to tools of ordinary nature, and is particularly adapted for removing burrs from the edge of the brake release hole of automobile hydraulic master brake cylinders.

In the type of hydraulic brakes now in common usage on automobiles, the master brake cylinder has a small hole through which fluid passes when the brakes are released. Upon application of the brakes, a rubber cup passes this hole and if the edge of the hole is sharp it cuts a groove in the rubber cup reducing the efficiency of the brakes. In order to avoid this, the edge of the hole must be smoothed by beveling or rounding. As the hole is in the interior of the master cylinder casting, it is impossible to reach it with ordinary tools to bevel or round the edge.

The object of the present invention is to provide a tool which can be inserted in confined areas and operated from without to deliver a hammer blow to an anvil or other device carried by the tool within the confined area.

A more specific object of the invention is to provide a tool of this nature in which the tool is of the pliers type for one-hand operation and the hammer is connected to the handles by a toggle-like connection so that considerable force may be stored up for moving the hammer before the toggle is broken.

Other objects of the invention will become apparent from the following description of one practical embodiment thereof when taken in conjunction with the drawings which accompany and form a part of this specification.

In the drawings:

Figure 1 is a longitudinal section through a tool constructed in accordance with the present invention, and a portion of an automobile hydraulic master brake cylinder, the hammer of the tool being shown in released position;

Figure 2 is a section similar to Figure 1 with the hammer in cocked position;

Figure 3 is a transverse section taken on the line 3—3 of Figure 2; and,

Figure 4 is an enlarged sectional view of one end of one arm of the tool showing the mounting of the anvil and its relationship to the cylinder release hole upon which it is to operate.

In general, the present invention comprises a pliers-type tool which can be operated by one hand by inserting the end of the tool into a restricted area and placing the anvil against the part to be operated upon. By squeezing the han-

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dles of the tool, a hammer will be cocked and tripped to deliver a blow against the anvil.

Although the tool will be described in connection with use for removing burrs from the edge of the release hole of automobile hydraulic master brake cylinders, it will be understood that this is merely by way of example, and that the tool is capable of a great many other uses.

Referring to the drawings in detail, the tool comprises a pair of arms 1 and 2 which are joined together through the medium of a hammer 3. Both arms 1 and 2 are shown as of channel construction, arm 1 being straight from end to end, and arm 2 being bent near its middle to provide for the movement necessary to operate the tool, as will be described.

The hammer 3 is an elongated bar, shorter than the arms 1 and 2, and rectangular in cross-section. A hole 4, transversely through the bar, is provided at the inner end of the hammer, and a second hole 5 is provided, longitudinally spaced from the hole 4. A pivot pin 6 passes through openings in the side webs of arm 1 and through the hole 4 in the hammer to pivotally connect the hammer to the arm, and a pin 7 connects the hammer to the side webs of the arm 2. Thus the hammer is pivotally connected to both arms, and forms a connecting link between the arms.

A spring 8 is positioned between the handle portions of the arms 1 and 2 to hold these portions of the arms in normally spread apart position. The spring has a central coil and extending legs bearing against the inner sides of the channeled arms. Either one or both of the legs of the spring may be attached to its arm to retain the spring in position.

At its far or hammer end, arm 2 carries a spring retaining clip 9, which is right angular and has its base riveted or otherwise secured to the bottom web of the channel. Its upstanding portion is in such position as to be substantially flush with the end of the hammer when the hammer is in cocked position within the arm 2. Hammer 3 is provided with a transverse groove 10 in its end face, and the upstanding portion of the retaining clip 9 is bent to form a matching ridge 11 to seat in the groove 10 to hold the hammer in cocked position.

Near the opposite end from the handle portion of arm 1 there is a hole 12 through the upper web of the channel to permit the head of anvil 13 to project into the inside of the arm where it can be struck by the hammer. Anvil 13 is supported upon the free end of a leaf spring 14 which has its opposite end riveted or otherwise secured to

the arm 1. The operative end of the anvil is pointed for easy entrance into the release hole of the master brake cylinder, the base of the tip broadening out, as at 14, to provide a beveled surface to engage the outer periphery of the brake cylinder release hole, shown at 15, to bevel or round this edge under the impact of the hammer.

In use, spring 8 will normally exert pressure against the handle portions of arms 1 and 2, causing the arms to separate. This outward pressure moves the hammer pivots 6 and 7 in opposite directions causing hammer 3 to move about its pivots into the channel of arm 2 until groove 10 engages ridge 11 in the retaining clip 9. The hammer is then in cocked position, and it will be seen that due to the action of spring 8 this is the normal or inoperative position of the tool. When it is desired to bevel or round the edge of a brake cylinder release hole, the tool is picked up by the handle portions of the arms 1 and 2 and the opposite end of the tool inserted into the casing of the brake cylinder. It will be noted from Figure 1 that the release hole 15 is a substantial distance within the casing and that the passage with which the hole communicates is too small for the use of ordinary tools. As mentioned above, the end of the tool is slipped into the casing until the anvil is in alignment with the release hole whereupon the tool is moved to insert the pointed end of the anvil into the hole. With the anvil held firmly seated against the rim of the hole, the handles of the tool are squeezed together. As the hammer is latched to the arm 1, pivot 7 is inoperative, and arm 2 and hammer 3 swing about pivot 6 spreading the jaws of the tool and moving the hammer away from the anvil. When arm 2 strikes the cylinder casing wall, as shown in Figure 1, there can be no further separating of the jaws as the anvil is in engagement with the release hole rim. As pressure on the handles is built up the force tending to rotate the hammer around its pivot 7 is increased, which force is initially overcome by the holding power of clip 9. When the force is sufficient, hammer 3 will snap free from clip 9 and, swinging about both pivots 6 and 7, will fly against the head of the anvil delivering an impact which is transmitted to the rim of the release hole with which the beveled face of the anvil is in contact. The resilient mounting of the anvil will ensure the beveled portion of the anvil striking flush against the hole rim, even though the tool and consequently the anvil, may be moved slightly by the sudden release of the hammer. As soon as pressure is released upon the handles, spring 8 causes the hammer to be re-cocked. Thus by squeezing and releasing the handles as many blows may be struck against the anvil as is necessary without removing the tool from the brake cylinder casing.

While in the above one practical embodiment of the invention has been described, it will be understood that the structure may depart from the precise embodiment shown and described within the scope of the invention as defined in the appended claims.

What is claimed is:

1. A hand tool comprising, a pair of arms, a hammer pivotally connected to each of said arms, said pivotal connections between said hammer and said arms being near one end of said hammer and spaced apart longitudinally of said hammer, and a latch carried by one of said arms to releasably engage the free end of said hammer.

2. A hand tool comprising, a pair of arms, a

hammer pivotally connected to each of said arms, the pivotal connections between said hammer and said arms being near one end of said hammer and spaced apart longitudinally of said hammer, a latch carried by one of said arms to releasably engage the free end of said hammer, and a spring between said arms to normally hold said arms apart and said hammer in engagement with said latch.

3. A hand tool comprising, a pair of arms, a hammer pivotally connected to each of said arms, the pivotal connections between said hammer and said arms being near one end of said hammer and spaced apart longitudinally of said hammer, and an anvil carried by one of said arms in position to be struck by said hammer when said arms are moved toward one another.

4. A hand tool comprising, a pair of arms, a hammer pivotally connected to each of said arms, the pivotal connections between said hammer and said arms being near one end of said hammer and spaced apart longitudinally of said hammer, a latch carried by one of said arms to releasably engage the free end of said hammer, and an anvil carried by the other of said arms in position to be struck by said hammer when said arms are urged toward one another with sufficient force to overcome the holding power of said latch.

5. A hand tool comprising, a pair of arms, a hammer pivotally connected to each of said arms, the pivotal connections between said hammer and said arms being near one end of said hammer and spaced apart longitudinally of said hammer, a latch carried by one of said arms to releasably engage the free end of said hammer, an anvil carried by the other of said arms in position to be struck by said hammer when said arms are urged toward one another with sufficient force to overcome the holding power of said latch, and a spring between said arms to normally hold said arms apart and said hammer in engagement with said latch.

6. A hand tool comprising, a pair of arms and a hammer, said hammer having one end pivotally connected to one of said arms at a mid-point thereof and a pivotal connection to a mid-point on the other of said arms at a point spaced longitudinally of said hammer from said end pivot, whereby movement of the arms toward one another will cause the hammer to swing relative to the arms.

7. A hand tool comprising, a pair of arms, a hammer having one end pivotally connected to a mid-point on one of said arms and a pivotal connection to a mid-point on the other said arm at a point spaced longitudinally of said hammer from said end pivot, whereby movement of the arms toward one another will cause the hammer to swing relative to the arms, and a latch carried near one end of one of said arms to releasably engage the free end of said hammer to hold said hammer to said arm until said arms are urged to one another with sufficient force to overcome the holding power of said latch.

8. A hand tool comprising, a pair of arms, a hammer having one end pivotally connected to a mid-point on one of said arms and a pivotal connection to a mid-point on the other said arm at a point spaced longitudinally of said hammer from said end pivot, whereby movement of the arms toward one another will cause the hammer to swing relative to the arms, a latch carried near one end of one of said arms to releasably engage the free end of said hammer to hold said hammer to said arm until said arms are urged

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toward one another with sufficient force to overcome the holding power of said latch, and a spring between said arms at the opposite end of said arms from said latch normally to hold said arms apart and said hammer in engagement with said latch.

9. A hand tool comprising, a pair of arms, a hammer having one end pivotally connected to a mid-point on one of said arms and a pivotal connection to a mid-point on the other of said arms at a point spaced longitudinally of said hammer from said end pivot, whereby movement of said arms toward one another will cause said hammer to swing relative to the arms, a latch carried near the end of one of said arms to releasably engage the free end of said hammer to hold said hammer to said arm until the arms are urged toward one another with sufficient force to overcome the holding power of said latch, an anvil mounted near the end of the other of said arms in position to be struck by said hammer when released from said latch, and a spring between said arms at the opposite ends from said

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latch and said anvil to hold said arms apart and said hammer in engagement with said latch.

10. In a tool as claimed in claim 9, said anvil having a pointed end for entrance into an opening to be beveled and an annular tapering shoulder therebeneath.

11. In a tool as claimed in claim 9, said anvil having a pointed end for entrance into an opening to be beveled and an annular tapering shoulder therebeneath, said anvil being secured to the free end of a resilient member having its other end fixed to one of said arms.

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