

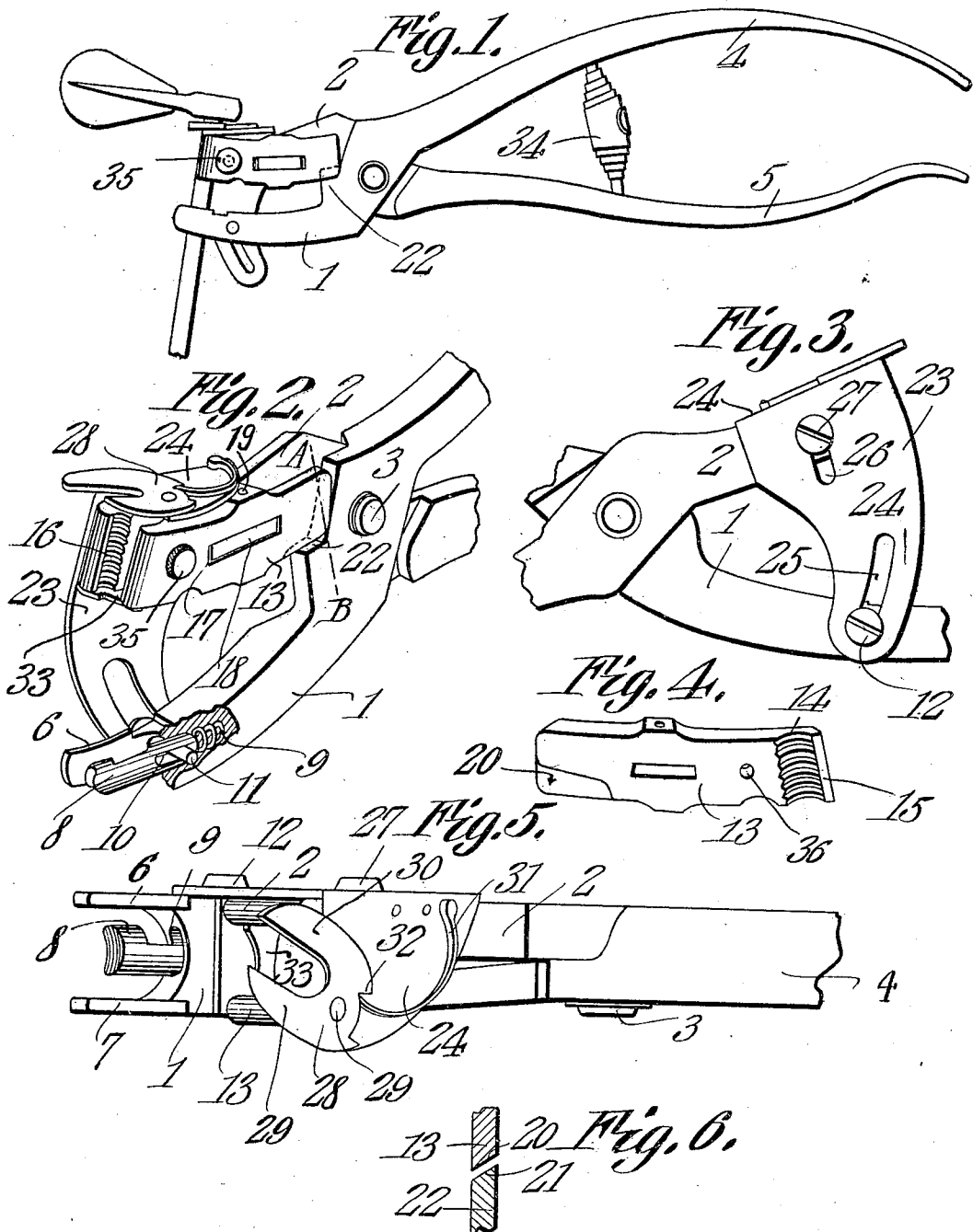
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PLIERS.

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PLIERS.

954,818.

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To all whom it may concern:

Be it known that I, ROBERT I. METZGER, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented new and useful Pliers, of which the following is a specification.

My invention relates to tools particularly to tools for extracting hammers from an action in a piano and has for an object to provide a device of this character which can be adjusted to the shank of any piano hammer and will easily and effectively remove the hammer therefrom without endangering the adjacent hammers.

Another object is to provide a device of this character which will be automatic in its adjustment to the shank of a piano hammer and will accurately lift the hammer therefrom without injuring the delicate adjustment of the action during the operation.

It is well known to those familiar with piano construction that the space between the hammers is so small, the hammers almost touching each other, that when the hammer shank is twisted it not only causes the corresponding hammer to work improperly but, by this twisting it throws the hammer against the next one to it and interferes with that one also. When one of these hammers must be removed for any reason it is a very difficult matter to disengage the hammer from its shank or stem without seriously injuring the adjacent hammers.

My invention makes it possible to secure the hammer from turning while being removed, and at the same time securely clamps the shank of the hammer without straining or warping the same from its true position during the removal of the hammer.

With the above advantages and other objects in view which will appear as the nature of the invention is better understood my invention comprises the novel details of construction and combination of parts illustrated in the accompanying drawings described in the following specification and set forth in the appended claims.

In the accompanying drawings,—Figure 1 is a view in elevation of a tool constructed in accordance with my invention showing the same applied to the shank of a piano hammer in position for the removal of the hammer. Fig. 2 is a perspective view of the movable jaws of the tool showing the same

in released position. Fig. 3 is a view in elevation of the reverse side of the jaws. Fig. 4 is a detail view of the clamping member. Fig. 5 is a plan perspective view of the tool. Fig. 6 is a fragmentary sectional view taken on the line A—B Fig. 2, looking in the direction of the arrow head.

In a more detailed description of my invention in which like characters of reference designate similar parts wherever they occur in the view shown 1 designates the actuating jaw and 2 the holding jaw of the tool, the jaws 1 and 2 each being offset and pivotally connected together at 3 and terminate in handle levers 4 and 5.

The holding jaw 1 is longitudinally recessed or forked to provide parallel longitudinal guide arms 6 and 7 that straddle the shank of a piano hammer and serve to laterally position the tool when in operation. For longitudinally positioning the tool a pressure foot 8 is provided. This pressure foot is seated in a recess 9 formed in the jaw intermediate the guide arms, one end of the foot being provided with a concave face to engage and slidingly fit the shank of the piano hammer, the opposite end being held in contact with a spring 9 which exerts an outward pressure on the foot and operates to force the same snugly in contact with the shank. The pressure foot may be mounted in the recess 9 in any suitable manner, the connection in this instance being made by providing the foot with a longitudinal slot 10 of a size to engage and slidingly fit the shank of a screw 11 which is positioned transversely in the jaw and limits the sliding movement of the foot by contact with the ends of the slot. The shank of the screw 11 projects beyond the lateral face of the jaw, as shown, and terminates in a rounded head 12, the purpose of which will presently appear.

In order to securely clamp the shank of the piano hammer and prevent the same from turning, while the hammer is being removed, a clamping member 13 is provided which works in conjunction with the holding jaw. The clamping member is preferably rectangular in contour and cross section and is provided at its forward end with a recessed working face 14 having threads 15 which cooperate with a correspondingly recessed and threaded working face 16 formed in the forward end of the holding jaw 2, to impinge against the shank of the piano

hammer. The clamping member is provided with a substantially rectangular slot 17 opening through its lateral sides and adapted to slidably fit a correspondingly shaped lug 18 projecting from the opposed face of the holding jaw. A pivot pin 19 passes vertically through the clamping member and lug 18 and permits a slight lateral or rocking movement of the clamping member. The end of the clamping member opposite its recessed working face is undercut or beveled to provide an inclined cam surface 20 for engagement with the inclined cam surface 21 of a shoulder 22 formed on the actuating jaw.

It is evident that when the handle levers 4 and 5 are compressed the actuated jaw will be moved in the direction of the holding jaw, the upwardly inclined cam surface 21 of the shoulder 22 being brought to bear upon the correspondingly inclined cam surface 20 of the clamping member by this movement and causing the rear end of the clamping member to be forced outward and the forward end to be swung inwardly on the pivot until its threaded working face is in contact with the shank of the piano hammer held in the recessed working face of the holding jaw, any further movement of the handle levers only tending to cause the threads to bite harder into the shank whereby the shank is held tighter against turning as the strain of removing the hammer is increased. In this way the shank is held positively from twisting so that the danger of the hammer turning in the process of the removal and damaging the adjacent hammers is reduced to a minimum.

For removing the hammer from the positively held shank a lifting member is provided. This lifting member is preferably made from a single piece of sheet metal and comprises a shank 23 and a head 24 extending along the top faces of the holding jaw and clamping member in a plane at right angles to the plane of the shank. The lifting member slidably fits the aligned lateral faces of the actuating and holding jaws, as shown, and is provided with a slot 25 that is sufficient in size to engage the shank of the before mentioned screw 11 carried by the actuating jaw and is retained in position by the rounded head 12 of said screw. Formed in the upper end of the lifting member is a slot 26 of a size to slidably engage the shank of a screw 27 carried by the holding jaw.

When the handle levers 4 and 5 are compressed the clamping member and holding jaw will clamp the shank of the piano hammer, the actuating jaw then will move upward and carry the screw 11 upward in the slot 25 until it reaches the upper end of the slot, the remaining movement of the lever operating to slide the lifting member upward until the screw 27 carried by the holding jaw

has reached the lower end of the slot 26 when the head 24 will have been lifted off from the upper surface of the holding jaw and the hammer resting upon this head removed from its shank. In order to accurately hold the head in its normal relation to its shank when being removed, a yoke plate 28 is swiveled on the upper surface of the lifting head at 29. The shank of the hammer engages the yoke 28 and swivels it around on the head until the branches 29 and 30 are positioned transversely the under side of the hammer on either side of the shank and evenly distribute the lifting pressure so that the hammer is lifted evenly and accurately from its shank. After the hammer has been removed and the tool disengaged from the shank the yoke is returned to its initial position by a leaf spring 31 which is secured at one end to the upper surface of the lifting head. The other end of the spring 31 slidably engages a marginal slot 32 formed in the yoke and stores up energy as the yoke is swiveled during the admission of the shank to return the yoke to its normal position upon the removal of the shank. For positioning the shank of the hammer vertically in the holding jaws before the jaws take hold, a guide plate 33 is secured to the underside of the holding jaw. This guide plate is recessed to conform to the contour of the shank and extends laterally from the under surface of the holding jaw in the direction of the clamping member, as shown.

A spring 34 is seated between the handle levers for normally holding the handles spaced apart in order that the actuating and holding jaws may be kept spread apart when in their normal or released position.

In order to limit the movement of the clamping member 13 a set-screw 35 is engaged into a screw-threaded annular opening 36 formed in the clamping member adjacent its working face. When the handles 4 and 5 are compressed to a point where any further movement would cause the jaw 2 and clamping element to crush the hammer shank, the set-screw will impinge the opposed face of the jaw 2 and prevent any further gripping movement of the jaw and clamping element.

From the foregoing description taken in connection with the accompanying drawings, it is thought that the construction and operation of my invention may be easily understood without requiring a more extended explanation, it being understood that various changes in the form, proportions, and minor details of construction may be made without sacrificing any of the advantages or departing from the spirit of the invention.

What is claimed is:—

1. In a tool, a pair of pivoted jaws, a clamping member pivoted upon one of the

jaws, means carried by the other jaw for rocking the free end of said clamping member toward its supporting jaw, a lifting member slidably mounted upon one of the jaws and having a laterally extending portion normally held in engagement with the outer face of said clamping member but adapted to have movement therefrom, and means for actuating said lifting member.

2. In a tool, a pair of pivoted jaws, a clamping member pivoted to one of the jaws, means carried by the other jaw for actuating said clamping member, and a lifting member slidably mounted on one of the jaws and having a laterally extending portion normally held in contact with the outer face of said clamping member, but adapted to have movement therefrom, and having a shank portion engageable with the other jaw for actuating said laterally extending portion.

3. In a tool, a pair of pivoted jaws, a clamping member pivoted to one of the jaws and having a cam face, a shoulder carried by the other of said jaws adapted to engage said cam face and rock said clamping member to cooperate with its supporting jaw, a lifting member slidably mounted on the first named jaw and having a laterally extending portion normally held in contact with the top face of said clamping member but adapted to be spaced therefrom, said lifting member being provided with a shank portion in engagement with the second named jaw whereby to actuate said laterally extending portion.

4. In a tool, a pair of pivoted jaws, a clamping member pivoted upon one of the jaws and having a cam face, a cam shoulder carried by the other of said jaws to engage

said cam face and rock the free end of said clamping member to cooperate with its supporting jaw, a lifting member slidably mounted on the first named jaw, said lifting member having a laterally extending portion extending over the outer faces of said clamping member and a shank portion in engagement with the other of said jaws, and a yoke plate swiveled on said laterally extending portion having a portion of the opening between its branches in registration with the opening between the opposed faces of said clamping member and its supporting jaw.

5. A tool having pivotally connected jaws, one of which is provided with a cam shoulder and terminal spaced guide arms, the other of said jaws being provided with a roughened working face, a clamping member pivotally connected to the second named jaw and having a roughened working face adapted to work in conjunction with the working face of said jaw, said clamping member having one end provided with a cam surface to engage said cam shoulder, a lifting member slidably fitted to the first named jaw, said lifting member having a head extending at right angles to the main body thereof and normally held in contact with the upper surface of said clamping member but adapted to be raised vertically therefrom substantially as described and for the purpose set forth.

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

ROBERT I. METZGER.

Witnesses:

GEO. METZGER,
I. FINKS.