Nov. 14, 1939. R. J. CHAMPAYNE 2,179,992

PNEUMATIC FENDER TOOL

Filed Nov. 26, 1934 2 Sheets-Sheet 1

Fig. 1

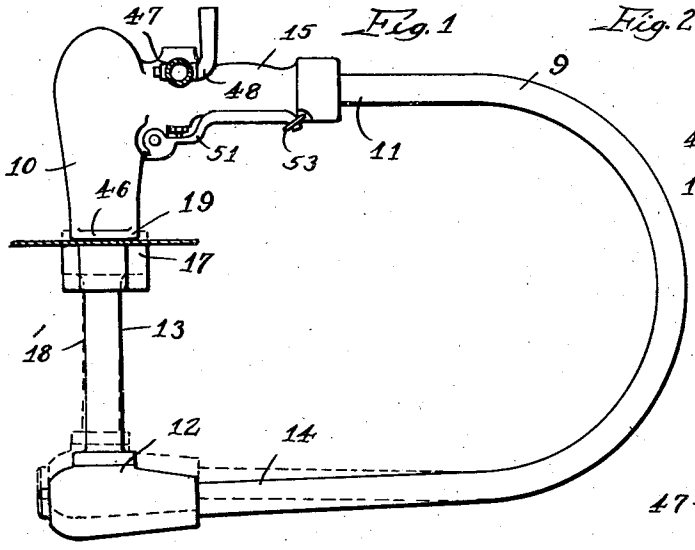


Fig. 2

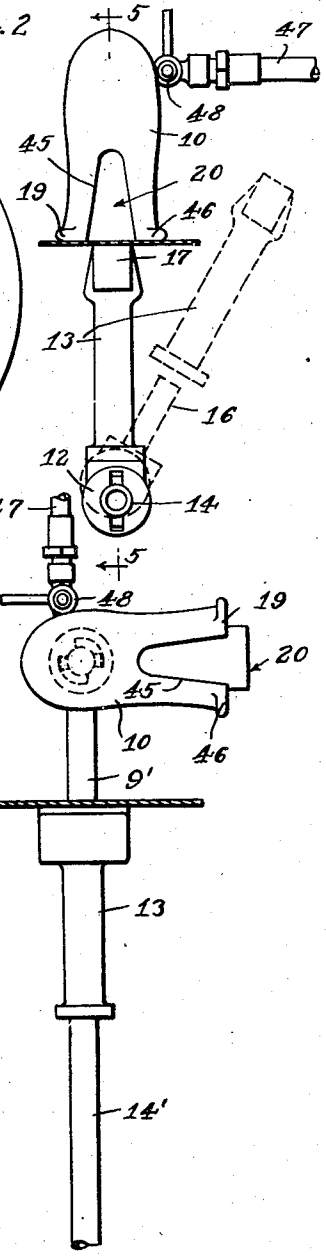


Fig. 3

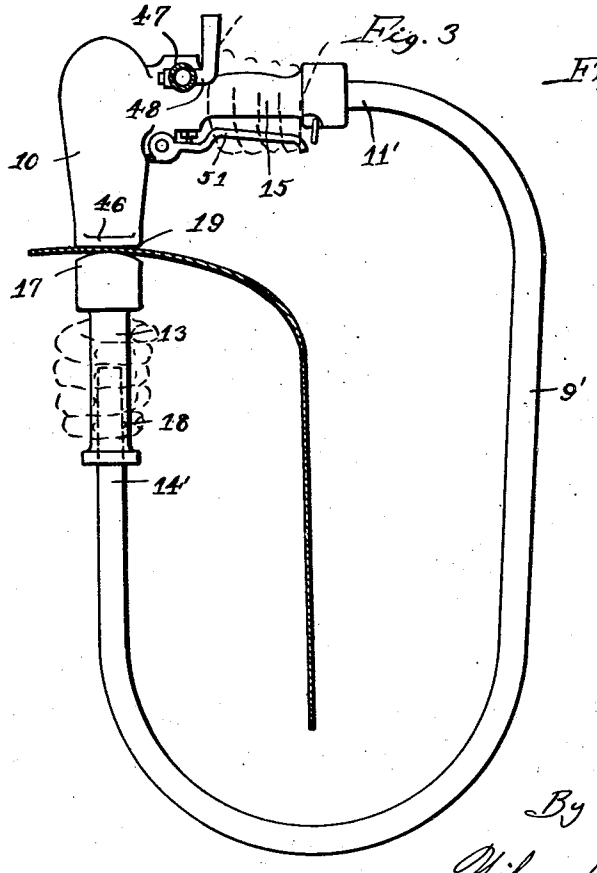


Fig. 4

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Fig. 5

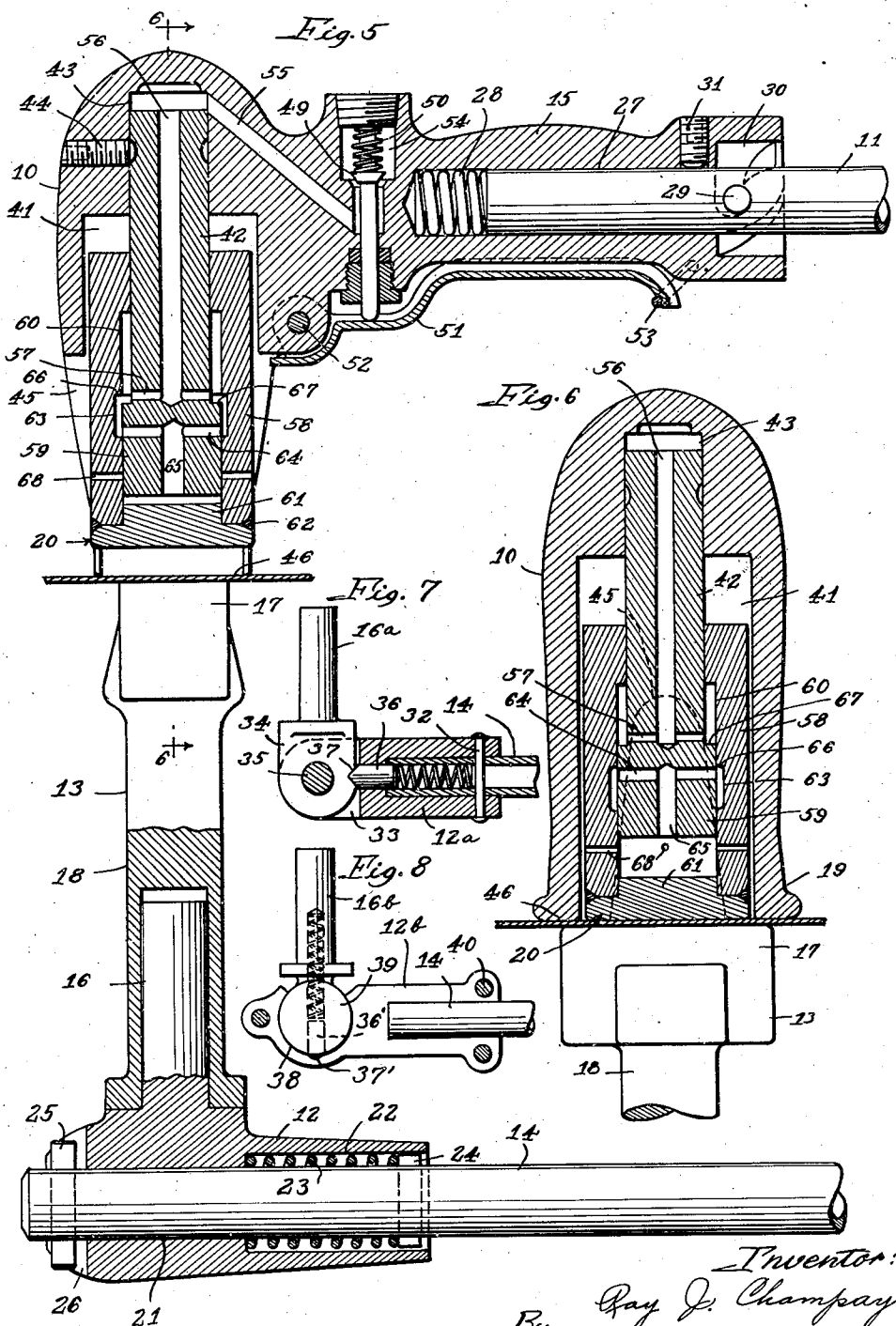


Fig. 6

Fig. 7

Fig. 8

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Patented Nov. 14, 1939 2,179,992

UNITED STATES PATENT OFFICE

2,179,992

PNEUMATIC FENDER TOOL

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Application November 26, 1934, Serial No. 754,716

32 Claims. (Cl. 153—32)

This invention relates to a pneumatically operated hammer suitable for use in restoring bent and dented sheet metal to its original shape and especially designed and adapted for fender and body work on automobiles and other vehicles.

I am aware that many fender tools have been devised, but actual working with most of these tools showed that they are, for the most part, impractical due to the unhandiness with which they must be brought into and out of position on the car or the awkwardness with which they must be manipulated and adjusted to suit varying conditions. Then, too, so many of these tools have been of heavy and costly construction, whereas, a light and moderately priced tool is generally demanded. It is, therefore, the principal object of my invention to provide a fender tool of novel design and economical construction permitting quick and easy access to and removal from the area of the part to be operated upon and enabling the operator to grasp the tool immediately adjacent the hammer head so as to guide it on the work and thus improve the character of the work done and also save time. The tool is, moreover, designed to afford maximum clearance around the hammer head and die to avoid interference in moving about on the work and thus increase the range of usefulness of the tool, the hammer head and the cooperating die being also adapted for mounting on a different shaped yoke, or different dies being adapted to be substituted for the particular one on the yoke, to suit the requirements of any job to be done. Furthermore, the lightness of the tool makes for greater handiness and speed of operation and less fatigue.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a fender tool made in accordance with my invention indicating by the dotted lines the extent to which the yoke is arranged to be sprung when the die is brought into position on the fender under the hammer head;

Fig. 2 is a front view of Figure 1, indicating in dotted lines the pivotal mounting of the die holder and how the die is removable therefrom;

Fig. 3 is a side view of the tool of my invention showing the use of a different shaped yoke and illustrating the tool in place on a fender;

Fig. 4 is a front view of Fig. 3, but showing the hammer head in the position assumed when the tool is being applied or removed from the fender;

Fig. 5 is a longitudinal section on the line 5—5 of Fig. 2 illustrating the construction of the hammer head as well as of the die and die holder;

Fig. 6 is a section taken on the line 6—6 of Fig. 5, and

Figs. 7 and 8 are sectional details showing modified or alternative constructions of die holders.

Similar reference numerals are applied to corresponding parts throughout the views.

Referring to the drawings, the numeral 9 designates the yoke or frame which carries a hammer head or housing 10 on the one arm 11 and the die or anvil holder 12 and die or anvil 13 on the arm 14. The yoke is preferably made from a piece of tubing bent to substantially U-shape to provide the arms 11 and 14 in substantially parallel relation. This shape is suitable for ordinary work, and one or more other yokes 9' may be provided of different shapes and sizes for use on skirted fenders and the less accessible body parts. The yoke 9', as shown in Fig. 3, has one arm 11' substantially at right angles to the other arm 14'. The hammer head 10 has a handle 15 for mounting the same on the yoke and the head may be removed from one yoke and put on another quickly and easily. The dies 13, of which a half dozen or more of different shapes and widths are usually provided for different shaped work, are arranged to be mounted interchangeably on the vertical post or standard 16 provided on the holder 12. The socket in each die is such that the dies will fit directly on the end of the vertical arm 14' of the yoke 9', as appears in Fig. 3. Whether the die is mounted on the holder 12 or directly on the yoke arm, as at 14', it is arranged to be turned by hand so that its shaped anvil end 17 conforms to the shape of the work. One important feature of my invention lies in the fact that the handle 15 projects directly from the upper end of the hammer head 10 so that the operator, who at the same time usually grasps the die by the shank 18 with his other hand to turn the die as the occasion requires, can more easily and quickly guide the tool on the work. In so many other tools the part or parts to be grasped are too remote from the working end and it is awkward and unhandy to manipulate the same and it follows that the character of the work performed suffered accordingly. The fact that the handle, while projecting directly from the head, is, nevertheless, somewhat removed from the fender engaging end 19 makes it much handier to get the tool into and out of place on the fender and offers much greater freedom of movement around on the work, there being less likelihood of any interference with the handle in such spaced relation to the fender engaging end of the head.

A rapidly reciprocating striker 20 is provided

on the head 10 to cooperate with the die 13 engaging the work from the opposite side to straighten out any bent or dented areas of the sheet metal coming between the striker and die. The arms of the yoke are, in accordance with my invention, arranged to be sprung apart to the extent indicated in Fig. 1 when the tool is applied to a fender, whereby to keep the anvil end of the die under a definite tension at all times, toward engagement with the fender on the opposite side from the hammer head. With the die thus tending always to move toward the head, the striker 20 and anvil 17 are always assured of cooperating to best advantage to speedily re-shape the metal therebetween. Furthermore, this obviates the necessity for any screw threaded adjustments on either the die, which is most common, or on the hammer head; with the present construction, the springiness in the yoke makes the tool self-adjusting and it follows that the work is greatly facilitated because the operator can, at all times, confine his attention to the work at hand instead of having to stop and bother with repeatedly adjusting the tool. The yoke is sprung in such a way that no real effort is required on the part of the operator. The die holder 12, which, as clearly appears in Fig. 5, has a bearing 21 to receive the arm 14 of the yoke, is counterbored, as at 22, to accommodate a coiled compression spring 23 held under compression in front of a cross-pin 24 in the arm 14, so that the holder is normally urged toward another cross-pin 25 provided in the end of the arm 14, whereby to lock the holder releasably in its operative position with the pin 25 engaged in a diametrical slot 26 in the end of the holder, but allow the holder to be swung laterally by merely forcing the holder away from the pin 25 enough to allow the holder to turn on the bearing 21. Thus, the operator gets the tool into the approximate position desired on the fender while the die holder is turned to one side substantially as shown in Fig. 2, and then the die is placed on the holder and moved toward alignment with the hammer head. Of course, the die comes into engagement with the fender before it is aligned with the hammer head and it is in the further movement, when the die is forced into alignment with the head, that the yoke arm 14 is sprung away from the arm 11, from the dotted line position of Fig. 1 to the full line position. There is, of course, considerable mechanical advantage in the movement of the die to dead center and, while slight manual effort is sufficient to bring the die into position, there is, nevertheless, appreciable end thrust upon the die toward the fender due to the spring action of the yoke when the die is in operative position. While I have shown the extent of flexing of the yoke 9 only, it should be understood that the yoke 9' appearing in Fig. 3 is also spread and is holding the die 13 under constraint to move toward the hammer head 19. In using yokes of this form, the die is not free to swing laterally and for that reason the hammer head 18 is constructed to be swingable on the arm 11', or for that matter on the arm 11, to an out-of-the-way position, as shown in Fig. 4, so that when the die is in place under the fender and the head is turned back toward alignment with the die and forced into dead center position in the same manner as previously described for the die, the yoke will be spread sufficiently to keep the die and hammer head under the desired end thrust toward each other.

The pivotal mounting of the hammer head is clearly shown in Fig. 5; the handle 15 has a longitudinal socket or bearing 27 therein in the inner end of which a coiled compression spring 28 is seated so as to be compressed in the entry of the yoke arm 11 or 11', whereby to afford the desired end thrust on the handle 15 to keep a cross-pin 29 that is provided on the yoke arm properly engaged in the bayonet slot 30 formed in the end of the handle. A set screw 31 threaded in the handle may be tightened to rigidly secure the handle to the yoke arm and avoid any likelihood of the hammer head turning out of alignment with its cooperating die. With the construction just described, it is apparent that one may easily remove the hammer head from one yoke and apply it as easily to another. Although both the hammer head and the die holder are swingable sidewise in the assembly of Figs. 1 and 2, the die holder is ordinarily the part to be swung out of the way in the application or removal of the tool from a fender, because of the greater ease with which it can be manipulated and the fact that there is no set screw to loosen and tighten. The bearings 21 and 27 in the die holder and hammer handle, respectively, are sufficiently elongated to make certain that the die and hammer will remain rigid with the yoke. Furthermore, the die holder and hammer handle are sufficiently enlarged to insure adequate strength at those two points of the tool where the greatest strains will occur in the operation of the tool.

While the die holder construction shown in Figs. 1, 2 and 5 is preferred because of its simplicity and economy as well as its strength and durability and the ease with which it can be manipulated, I have shown modified or alternative constructions in Figs. 7 and 8. The holder 12a in Fig. 7 is fastened by means of a pin 32 on the end of the yoke arm 14 and has a bifurcated or clevis end 33 in which a head 34 carrying a post 16a is pivoted, as at 35, to swing outwardly with respect to the end of the yoke arm instead of laterally. A latch 36 held under spring pressure, as shown, toward engagement in a notch 37 in the head 34 serves to lock the post 16a releasably in its normal operative position. The post can, however, be swung out of the way with very little effort, especially when a die is placed thereon to afford additional leverage.

The die holder 12b of Fig. 8 is of two-piece construction and provides a socket 38 to receive the headed end 39 of the post 16b. Bolts or screws 40 hold the halves of the die holder together and serve to clamp the same onto the yoke arm 14 and, of course, retain the head 39 in the socket. The spring-pressed latch indicated at 36' cooperates with a notch 37' similarly as in the construction of Fig. 7, whereby to hold the post 16b releasably in its normal operative position and yet allow the post to be swung to an out-of-the-way position when desired. With this construction, it is obvious that the post can have universal movement with respect to the end of the yoke arm.

The hammer construction is clearly shown in Figs. 5 and 6. The hammer head 19 has a vertical cylindrical chamber 41 therein in which the striker 20 operates with plenty of clearance, the striker being reciprocable with a close working fit on a vertical guide pin 42, the upper end of which fits into a bore 43 provided in the upper end of the head 19 and being fastened in place by means of a set screw 44 threaded in the head as shown. The lower half of the head 19 is bifurcated, as in-

dicated at 45, to provide two broad presser feet 46 on the lower end 19 for engagement with the sheet metal to either side of the striker and directly over the anvil end 17 of the cooperating die 13. See Figs. 2 and 6. In that way, the head is assured of good broad bearing on the fender to support the tool so that there will be no likelihood of nicking or otherwise marring the fender, especially during the vibration of the tool incident to the operation of the hammer. In other fender tools, I have noticed that the hammer head is not properly supported and there is a tendency to actually cut the fender in the operation of whatever form of upper die is used, whether it be a crank-operated push or press member, or what not, and, as a result, the entire surface operated upon is found to contain innumerable small cuts which, of course, show up in the subsequent refinishing of the fender or make it necessary for the workman to perform an extra operation to fill in and smooth out the nicked areas. With the present construction the broad bearing surfaces at 46 avoid any danger to the surface operated upon. The fact that the hammer head straddles the area being hammered facilitates matters all around, because the operator can always see what he is doing and can guide the tool to best advantage for the best and quickest results.

The hammer is of the pneumatic type as compressed air is supplied through a flexible hose 47 connected to a stop cock 48 projecting from one side of the handle 15 where the handle of the cock will be easily accessible for the operator to turn off the air when the tool is to be laid aside for any length of time. Any suitable valve 49 is provided normally closed by the action of a spring 50 but arranged to be opened by means of a trigger 51 pivoted as at 52 for convenient finger operation by the same hand grasping the handle 15 and guiding the tool on the work. While a short trigger may be employed, operable by the index finger of the hand grasping the handle, I have shown a trigger extending the full length of the handle and hence operable by closing the hand thereon. An eyelet 53 is shown pivoted to the outer end of the handle 15 and arranged to swing into a position holding the trigger raised, so that the operator can keep the hammer going without keeping a tight grip on the handle and trigger, thus avoiding fatigue. When the valve 49 is opened, air from the chamber 54 is delivered through a passage 55 into the upper end of the bore 43. From there it flows through the longitudinal passage 56 in the guide 42 and out through radial holes 57 into the cylinder 58 which forms the body of the striker 20. The guide 42 is a stationary piston and has the end 59 enlarged and operating with a close working fit in the bore 60 of the cylinder, the latter being arranged to reciprocate relative to the piston. A plug 61, specially hardened, and welded, as at 62, onto the end of the cylinder 58 closes the end of the cylinder and provides a durable striking surface. The bore 60 is enlarged for a short distance, as at 63, to provide communication between the holes 57 and holes 64 whereby to deliver air through another longitudinal passage 65 in the end of the guide 42 into the lower end of the cylinder 58, and thus move the striker 20 downwardly to the position shown in Fig. 6. Only a momentary impulse is given to the striker to move downwardly because just as soon as the shoulder 66 defining the upper end of the enlargement 63 passes the shoulder 67 defining the upper end of the enlargement 59, the air supply to the holes 64 and passage 65 is cut off. At the lower end of the stroke of the cylinder 58, radial holes 68 are uncovered as they pass the lower end of the enlargement 59, as appears in Fig. 6, and hence the compressed air is exhausted to the atmosphere. Now, when that occurs, since there is only atmospheric pressure in the lower end of the cylinder, and compressed air is still being delivered through holes 57 to the upper end of the cylinder bore 60, it follows that the cylinder will be forced upwardly and thus the striker is retracted for its next stroke. The plug 61 does not strike the enlarged end 59 of the guide 42 on the upstroke because just as soon as the shoulder 66 passes the shoulder 67, compressed air is again supplied through the passage 65 to move the cylinder downwardly, see Fig. 5. The hammer is, therefore, quiet in its operation, there being no pounding of metal to metal at opposite ends of the stroke and consequently the hammer mechanism will last indefinitely. Furthermore, the force of the blow delivered by the striker is accurately predetermined by shortening or lengthening the enlarged portion 63 so as to accordingly advance or retard the cut-off of air on the down-stroke. The striker is operated so as to hit hard enough to shape the heaviest metal which the tool will be expected to operate upon, and, on the other hand, due to the cushioning action of the compressed air delivered to the upper end of the bore 60 (Fig. 6), the striker cannot strike with sufficient force to damage even the lightest metal that may be encountered, the effect of the cushioning action being greater and greater the more the stroke of the striker is increased.

The fact that the striker is welded into a single piece means that the entire hammer mechanism is, in reality, composed of two parts which constitutes reduction of the mechanism to the least possible number of parts. There is nothing to come loose and nothing to get out of adjustment. Furthermore, the cylinder and piston parts of the hammer mechanism provide their own valves by the sliding of ports on the one with respect to the ports in the other, as above stated. The hammer is, therefore, kept free of any trouble that might otherwise arise in the use of valves.

It is believed the foregoing description conveys a good understanding of my invention. The appended claims have been drawn with a view to covering all legitimate modifications and adaptations.

I claim:

1. A tool of the class described comprising a one-piece generally U-shaped resilient frame having the ends of the two arms thereof adapted to be spread apart but disposed normally in a certain spaced relation prior to their straddling a fender or other sheet metal body to be hammered, and a hammer head and an anvil arranged to be carried on said frame so as to project inwardly from said arms toward each other and engage opposite sides of the metal at a point in the area to be operated upon, the hammer head having a power-operated reciprocable striker therein to hammer the metal adjacent the point of engagement therewith by said head, said head and anvil in normal operative relation holding the arms spread apart, whereby the head and anvil are resiliently urged toward each other for the purpose described, and means for mounting said head and anvil on said frame whereby the arms of said frame are arranged to be spread apart automatically in the application of the tool to the work.

2. A tool of the class described comprising a one-piece generally U-shaped resilient frame having the ends of the two arms thereof adapted to be spread apart but disposed normally in a certain spaced relation prior to their straddling a fender or other sheet metal body to be hammered, a hammer head and an anvil carried on the ends of said arms so as to project inwardly from said arms toward each other and engage opposite sides of the metal at a point in the area to be operated upon, the hammer head having a power-operated reciprocable striker therein to hammer the metal adjacent the point of engagement therewith by said head, said head and anvil in normal operative relation holding the arms spread apart, whereby the head and anvil are resiliently urged toward each other for the purpose described, and means pivotally mounting one of said head and anvil tools on the end of the associated arm for swinging movement relative to the arm into dead center relation to the other tool, whereby to permit moving said tool from a retracted inoperative position, spaced from and in transverse relation to the companion tool, to a position in end to end operative relation therewith and thereby simultaneously spread the arms of said frame.

3. A tool of the class described comprising a one-piece generally U-shaped resilient frame having the ends of the two arms thereof adapted to be spread apart but disposed normally in a certain spaced relation prior to their straddling a fender or other sheet metal body to be hammered, a hammer head and an anvil carried on the ends of said arms so as to project inwardly from said arms toward each other and engage opposite sides of the metal at a point in the area to be operated upon, the hammer head having a power-operated reciprocable striker therein to hammer the metal adjacent the point of engagement therewith by said head, said head and anvil in normal operative relation holding the arms spread apart, whereby the head and anvil are resiliently urged toward each other for the purpose described, and means pivotally mounting said head and anvil tools on said arms for swinging movement of either tool relative to its associated arm into dead center relation to the other tool, whereby to permit moving said tool from a retracted inoperative position, spaced from and in transverse relation to the companion tool, to a position in end to end operative relation therewith and thereby simultaneously spread the arms of said frame.

4. A device of the class described comprising a hammer head arranged to steadily engage the work and having a longitudinal bore, a striker reciprocable in said bore, the head having a bifurcated lower portion each half of which has a broad flat bottom bearing surface, the surfaces being in a common plane and arranged to bear on the work substantially their full width at diametrically opposite sides of the striker and in a common plane with the work engaging surface of the striker, whereby to support said hammer head on the work without danger of marring the same in the vibration of the head incident to reciprocation of the striker, a die for engagement with the other side of the work at the point engaged by the striker and aforesaid bearing surfaces of the hammer head, and a frame interconnecting said hammer head and die.

5. A device as set forth in claim 4 wherein the frame is generally U-shaped and resilient and provides two arms normally in a certain spaced relation, the hammer head being carried on one of said arms and the die being carried on the other of said arms, said arms being spread apart when the head engages the one side of the work and the die engages the other side of the work, whereby the bearing surfaces of the head and said die are resiliently urged toward each other for substantially constant and full engagement with the work throughout the operation of the striker.

6. A power operated tool of the character described comprising in combination a generally U-shaped frame member adapted to straddle a metal body to be hammered, a hammer head having at one end a work engaging surface and at its other end a handle projecting therefrom in transverse relation thereto and remote from but substantially parallel to the surface of the work being operated upon, and one end of said U-shaped frame member being likewise remote from but substantially parallel to the surface of the work being operated upon, said end being secured directly to said handle to support the hammer head thereon, said hammer head being arranged to be guided by means of said handle over areas of the metal body to be hammered, a power operated striker reciprocable on said head, and an anvil member mounted on the other end of said U-shaped frame member in substantially coaxial relation with said striker.

7. A tool as set forth in claim 6 wherein said handle is detachably secured to the frame member whereby to permit interchangeable mounting of said hammer head on different frame members, the said handle cooperating with the hammer head and frame member in the same way in each assembly.

8. A tool as set forth in claim 6 wherein said handle is pivotally mounted on said frame member for swinging movement to and from operative position whereby to increase the normal clearance between the hammer head and anvil member for the purpose described, the tool including means for releasably securing said hammer head in its operative position on the frame member.

9. A power operated tool of the character described comprising in combination a generally U-shaped frame member of reduced cross-section whereby it has a desired degree of flexibility, said frame member being so formed that it is adapted to straddle a metal body to be hammered, a hammer head having a power operated striker reciprocable therein and arranged to engage one side of the work, a die arranged to engage the other side of the work, a die holder whereon the die is removably held, and tubular bearing portions provided on the hammer head and die holder larger in cross-section than the frame member, whereby the bearing portion on the hammer head is adapted to serve as a handle, and said portions are adapted to receive therein the ends of said frame member to mount the head and die thereon.

10. A tool as set forth in claim 9 wherein the die holder is swingable sidewise relative to the hammer head about the associated end of said frame member as an axis on its tubular bearing portion, the tool including means for detachably securing said bearing portion in a position wherein the die on the die holder is in substantially coaxial relation to the striker.

11. A tool as set forth in claim 9 wherein both of the tubular bearing portions are constructed to permit swinging movement of the hammer head and die holder sidewise relative to one an-

other about the associated ends of the frame member as axes, the tool including means for detachably securing said bearing portions in a certain position with respect to said frame member in which the die on the die holder is disposed in substantially coaxial relation with the striker.

12. A tool as set forth in claim 9 wherein the hammer head is swingable sidewise relative to the die holder about the associated end of said frame member as an axis on its tubular bearing portion, the tool including means for detachably securing said bearing portion in a position wherein the striker on the hammer head is disposed in substantially coaxial relation with the die on the die holder.

13. A power hammer comprising, in combination, a work engaging head, a power hammer reciprocable with respect thereto, an anvil associated with said head to engage the opposite side of the work, and a U-shaped spring frame bridging the work and having the head and anvil mounted thereon so as to urge the same resiliently toward each other to steadily engage the work from opposite sides, the frame itself furnishing the spring pressure when spread and being arranged to be spread automatically in the application of the hammer to the work.

14. In a pneumatically operated hammer arranged to be guided by hand, a hammer head having a handle extending directly therefrom for guiding said head on the surface to be hammered, and a pneumatically operated hammer mechanism in said head including a striker having a working cylinder thereon and movable therewith, and a relatively stationary guide having a piston thereon disposed in said cylinder, the guide and piston having passages and ports for conducting compressed air into said cylinder and said cylinder having a cooperating air conducting channel through which air is delivered to one end of said cylinder for the working strokes, air being constantly delivered to the other end of said cylinder to cushion the working strokes of the striker and move the cylinder on the return strokes, and said cylinder having an exhaust port uncovered upon engagement of the striker with the work.

15. A hammer as set forth in claim 14 wherein the channel in said cylinder comprises an internal annular groove, the one end of which moves relative to the adjacent end of the piston to supply or cut off air to the working end of the cylinder, said groove being of a predetermined length so as to advance or retard the cut-off of air on the working strokes and accordingly increase or decrease the cushioning action and thereby determine the force of each blow delivered by the striker.

16. A power hammer comprising a stationary piston element having a reduced stem portion and an enlarged head portion, the stem having a longitudinal air delivery passage therein terminating at the head and having one or more radial holes for delivering air from said passage, the head having a longitudinal passage open at the forward end thereof and having one or more radial holes in a predetermined spaced relation to the rear end of said head, and a striker having a working cylinder reciprocable on said stem with a close working fit and containing a cylindrical bore receiving the head with a close working fit, said cylinder having an internal groove intermediate the ends of the bore and of sufficient length measured longitudinally of the cylinder to establish communication between the last-mentioned radial hole and the first-mentioned radial hole in a retracted position of the cylinder, and said cylinder having one or more exhaust holes extending from the cylindrical bore in longitudinally spaced relation to said groove so as to be covered by the head in the retracted position of the cylinder and uncovered in a forward position of said cylinder.

17. A tool of the class described, comprising a hammer head and die in substantially coaxial alignment, both of elongated form and relatively reduced cross-section, the die being formed to provide an elongated handle behind an enlarged work engaging end, the hammer head having a work engaging end with a reciprocable striking tool therein and having a second elongated handle extending laterally from its other end in transverse relation to the first-mentioned die handle, and a yoke having spaced free ends one of which enters the second handle for support of the hammer head and the other of which supports the die by its handle.

18. A tool of the class described, comprising a hammer head and die in substantially coaxial alignment, both of elongated form and relatively reduced cross-section, the die being formed to provide an elongated handle behind an enlarged work engaging end, the hammer head having a work engaging end with a reciprocable striking tool therein and having a second elongated handle extending laterally from its other end in transverse relation to the first-mentioned die handle, a die holder having the die removably supported thereon by its handle portion, and a yoke having spaced free ends one of which enters the second handle for support of the hammer head and the other of which enters the die holder for support of the die.

19. A tool of the class described, comprising a hammer head and die in substantially coaxial alignment, both of elongated form and relatively reduced cross-section, the die being formed to provide an elongated handle behind an enlarged work engaging end, the hammer head having a work engaging end with a reciprocable striking tool therein and having a second elongated handle extending laterally from its other end in transverse relation to the first-mentioned die handle, a die holder comprising a portion substantially parallel to the hammer head handle and a transverse portion for removably supporting the die by its handle portion, and a yoke having spaced and substantially parallel free ends one of which enters the hammer head handle and the other of which enters the first-named portion of the die holder for support of the hammer head and die.

20. A tool as set forth in claim 19 wherein one of said hammer head and die tools is arranged for swinging movement transversely in relation to the companion tool by reason of the pivotal engagement of one of said parallel handle and die holder portions on the associated yoke end.

21. A tool as set forth in claim 19, wherein the substantially parallel hammer head handle and die holder portions are both arranged for pivotal movement about the related ends of the yoke, whereby to permit swinging movement of either the hammer head or die sidewise relative to the other, for the purpose described.

22. A tool of the class described comprising a one-piece generally U-shaped frame having the ends of the two arms thereof adapted to be spread apart but disposed normally in a certain spaced relation prior to their straddling a fender

or other sheet metal body to be hammered, a hammer head carried rigidly on the end of one of said arms and projecting inwardly toward the end of the other arm, a die holder carried on the end of the other arm having a standard normally projecting inwardly toward the hammer head, a die detachably mounted on said standard, the hammer head and die engaging opposite sides of the metal at a point in the area to be operated upon, the hammer head having a power operated reciprocable striker therein to hammer the metal adjacent the point of engagement therewith by said head, said head and die in normal operative relation holding the arms spread apart whereby the head and die are resiliently urged toward each other for the purpose described, and means permitting pivotal movement of the standard and die relative to the end of the associated arm, whereby to permit moving said die from a retracted inoperative position spaced from and in transverse relation to the hammer head, to a position in end to end operative relation therewith and thereby simultaneously spread apart the arms of said frame.

23. A device as set forth in claim 4 wherein the frame is generally U-shaped and resilient and provides two arms normally in a certain spaced relation, the hammer head being carried on one of said arms and the die being carried on the other of said arms, the device including means for mounting at least one of said parts for pivotal movement with respect to its associated arm, whereby said arms are arranged to be spread apart when the head and die are disposed in alignment and engage opposite sides of the work, so that the bearing surfaces of the head and die are resiliently urged toward each other for substantially constant and full engagement with the work throughout the operation of the striker.

24. An air hammer having in combination relatively reciprocable, interfitting piston and cylinder elements, the piston element having a stem portion and enlarged head portion fitting in the reduced open end and relatively enlarged bore, respectively, of the cylinder element, whereby an annular shoulder of small area defined between the stem and the cylinder wall at one end of the movable element is subjected to air pressure in return strokes, and the larger area on the other end of the movable element is subjected to air pressure in the power strokes, whereby to apply greater force to the movable element in the power strokes thereof than in the return strokes thereof, means whereby compressed air is delivered continuously to the small area end of the cylinder and through the piston element intermittently to the other end of the cylinder, and means for exhausting air from the latter end of the cylinder only at the end of the power strokes of the movable element.

25. In a pneumatically operated hammer arranged to be guided by hand, a hammer head having a handle extending directly therefrom for guiding said head on the surface to be hammered, and a pneumatically operated hammer mechanism comprising relatively movable piston and cylinder elements in said head, the movable element constituting a striker for engagement with the work, the piston and cylinder elements having passages and ports for conducting compressed air into the cylinder and the cylinder having a cooperating air conducting channel through which air is delivered to one end of the cylinder in the working strokes of the movable element, air being constantly delivered to the other end of said cylinder to cushion the working strokes of the movable element and cause return movement thereof, and said cylinder having an exhaust port uncovered upon engagement of the movable element with the work.

26. A power hammer comprising relatively movable piston and cylinder elements, the piston element having a reduced stem portion and an enlarged head portion, the stem having a longitudinal air delivery passage therein terminating at the head and having one or more radial holes for delivering air from said passage, the head having a longitudinal passage open at the forward end thereof and having one or more radial holes in a predetermined spaced relation to the rear end of said head, and said cylinder element having a bore receiving the head of said piston with a working fit, and a reduced end receiving the stem with a working fit, the cylinder having an internal groove intermediate the ends of the bore and of sufficient length measuring longitudinally of the cylinder to establish communication between the last mentioned radial hole and the first mentioned radial hole in a retracted position of the movable element, and said cylinder having one or more exhaust holes extending from the bore in longitudinally spaced relation to said groove so as to be covered by the head of the piston in the retracted position of the movable element and uncovered in a forward position thereof.

27. A tool of the class described comprising a hammer head and die in substantially coaxial alignment, both of elongated form and relatively reduced cross-section, the die being formed to provide an elongated handle behind an enlarged work engaging end, the hammer head having a work engaging end with a reciprocable striking tool therein and having a second elongated handle extending laterally from its other end in transverse relation to the first-mentioned die handle, and a yoke having spaced free ends, one of which extends to the second handle to support the hammer head by its handle and the other of which extends to the die to support the die by its handle, at least one of said hammer head and die tools being mounted for swinging movement relative to the end of the yoke transversely in relation to the companion tool.

28. A tool of the class described, comprising a hammer head and die in substantially coaxial alignment, both of elongated form and relatively reduced cross-section, the die being formed to provide an elongated handle behind an enlarged work engaging end, the hammer head having a work engaging end with a reciprocable striking tool therein and having a second elongated handle extending laterally from its other end in transverse relation to the first-mentioned die handle, a die holder comprising a supporting portion, and a standard pivotally mounted on the supporting portion on a transverse axis and arranged to removably support the die thereon by its handle portion, means for releasably securing the standard in rigid relation to the supporting portion of the die holder in a position substantially coaxially aligned with respect to the hammer head, and a yoke having spaced free ends, one of which is secured to the hammer head and the other of which is secured to the supporting portion of the die holder for support of the hammer head and die.

29. A tool of the class described, comprising a hammer head and die in substantially coaxial

alignment, both of elongated form and relatively reduced cross-section, the die being formed to provide an elongated handle behind an enlarged work engaging end, the hammer head having a work engaging end with a reciprocable striking tool therein and having a second elongated handle extending laterally from its other end in transverse relation to the first-mentioned die handle, a die holder comprising a supporting portion and a standard mounted on the supporting portion for universal pivotal movement relative thereto and arranged to removably support the die thereon by its handle portion, means for releasably securing the standard in rigid relation to the supporting portion of the die holder in a position substantially coaxially aligned with respect to the hammer head, and a yoke having spaced free ends, one of which is secured to the hammer head and the other of which is secured to the supporting portion of the die holder for support of the hammer head and die.

30. A tool of the class described, comprising a hammer head and die in substantially coaxial alignment, both of elongated form and relatively reduced cross-section, the die being formed to provide an elongated handle behind an enlarged work engaging end, the hammer head having a work engaging end with a reciprocable striking tool therein and having a second elongated handle extending laterally from its other end in transverse relation to the first-mentioned die handle, a die holder comprising a supporting portion, and a standard arranged to removably support the die thereon by its handle portion, a yoke having spaced free ends, one of which is secured to the hammer head and the other of which is pivotally secured to the supporting portion of the die holder for support of the hammer head and die, and means for releasably securing the supporting portion of the die holder in rigid relation to the yoke end so that the standard is substantially coaxially aligned relative to the hammer head.

31. A fender hammer comprising, in combination, a fender engaging head, a power hammer reciprocable with respect thereto, an anvil associated with the head to engage the opposite side of the fender, a U-shaped spring frame arranged to bridge the fender and having the head and anvil mounted thereon so as to urge the same resiliently toward each other to steadily engage the fender from opposite sides, and means for swingably mounting one of the anvil and head elements on the frame in such relation to the other element that the frame must be spread in order to bring the swingable element into operative position relative to the other element, the frame being arranged to be spread thus in the application of the hammer to the fender to furnish the spring pressure itself for resiliently urging the head and anvil toward each other.

32. A tool of the kind described comprising, in combination, a hammer head having a power operated striker reciprocable therein, an anvil adapted to occupy an opposed operative position with relation to the hammer head, and a resilient structure for supporting said anvil and head yieldably relative to one another so that the anvil is urged resiliently toward the head to steadily engage opposite sides of a piece of work entered therebetween, said structure including a U-shaped frame connected at one end to said hammer head and extending from the hammer head to a point beneath the hammer head, and an anvil holder pivotally mounted on the portion of the frame which extends beneath the hammer head and adapted for pivotal movement on its mounting into and out of coaxial operative relationship to said head, the arrangement being such that movement of the anvil holder into the aforesaid coaxial position with respect to the hammer head results in the anvil and the head being resiliently urged toward each other and against the opposite sides of the work piece as aforesaid.

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