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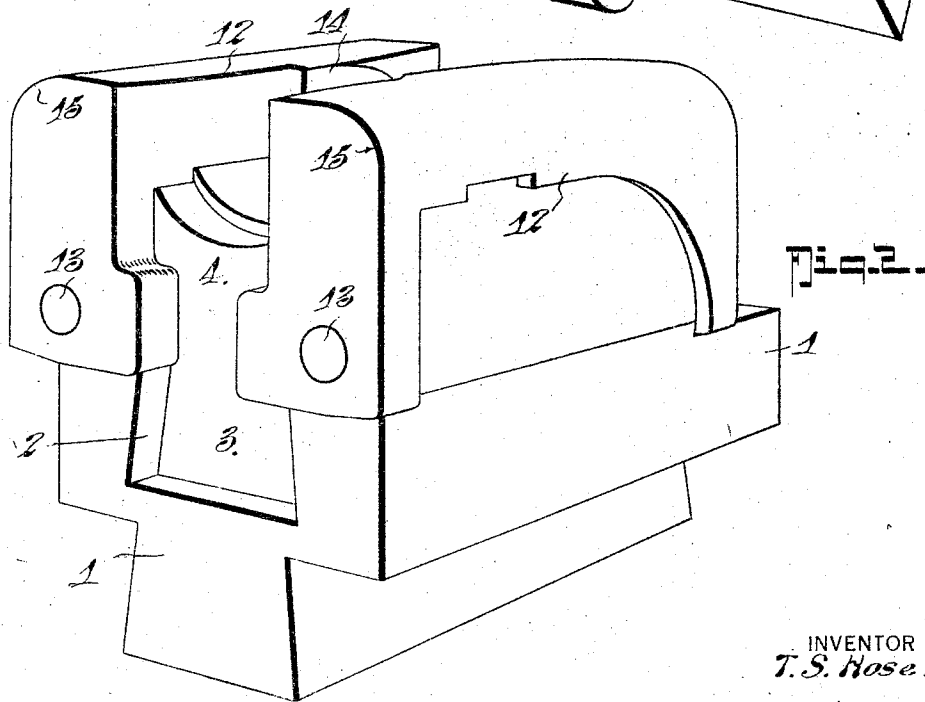
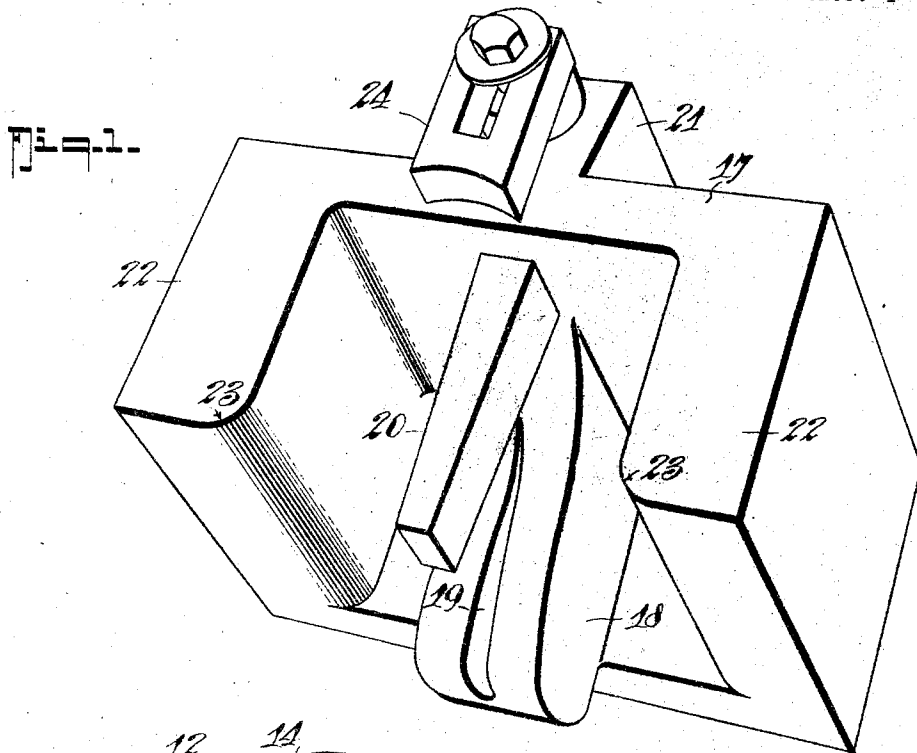
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T. S. HOSE

DIE FOR FORGING CLAW HAMMERS

Filed April 6, 1925

4 Sheets-Sheet 1



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72-401

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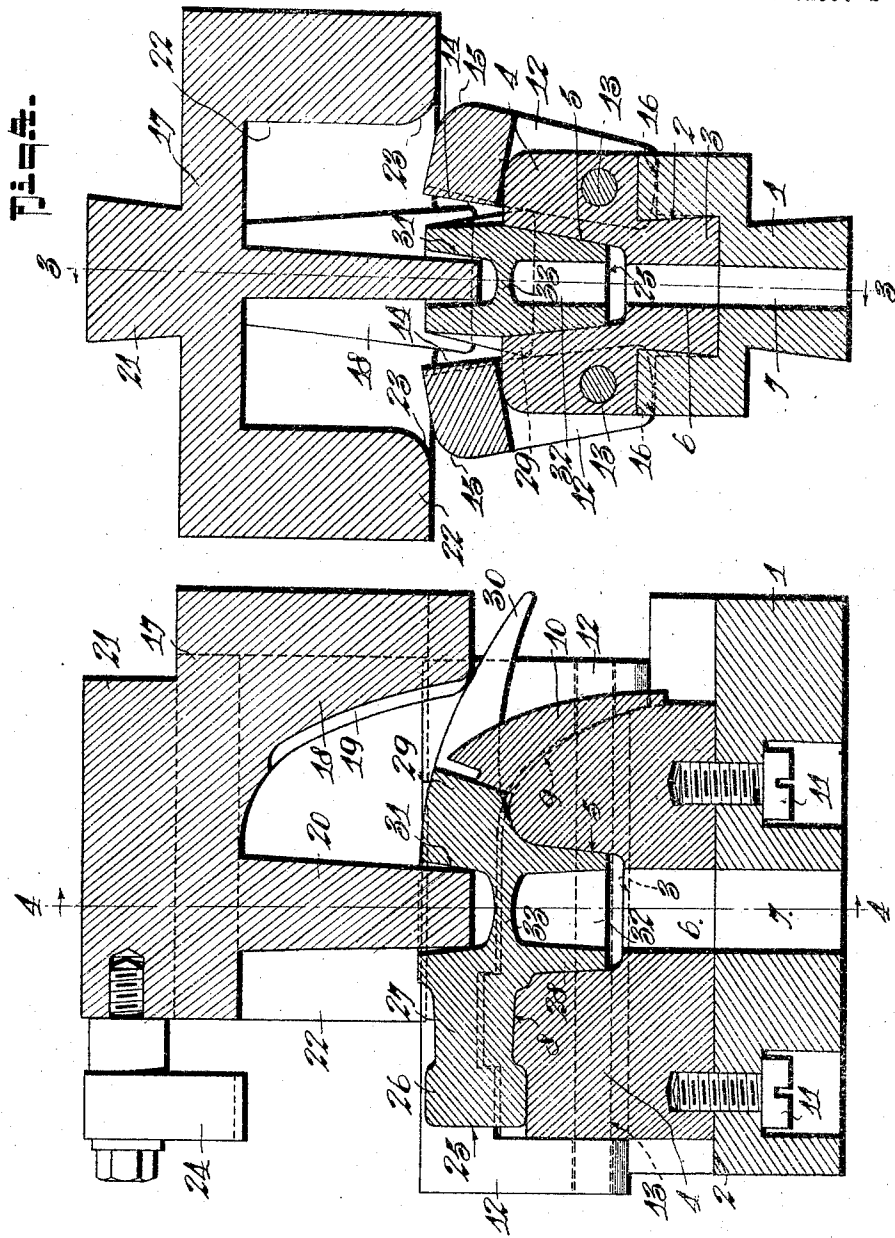
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4 Sheets-Sheet 2



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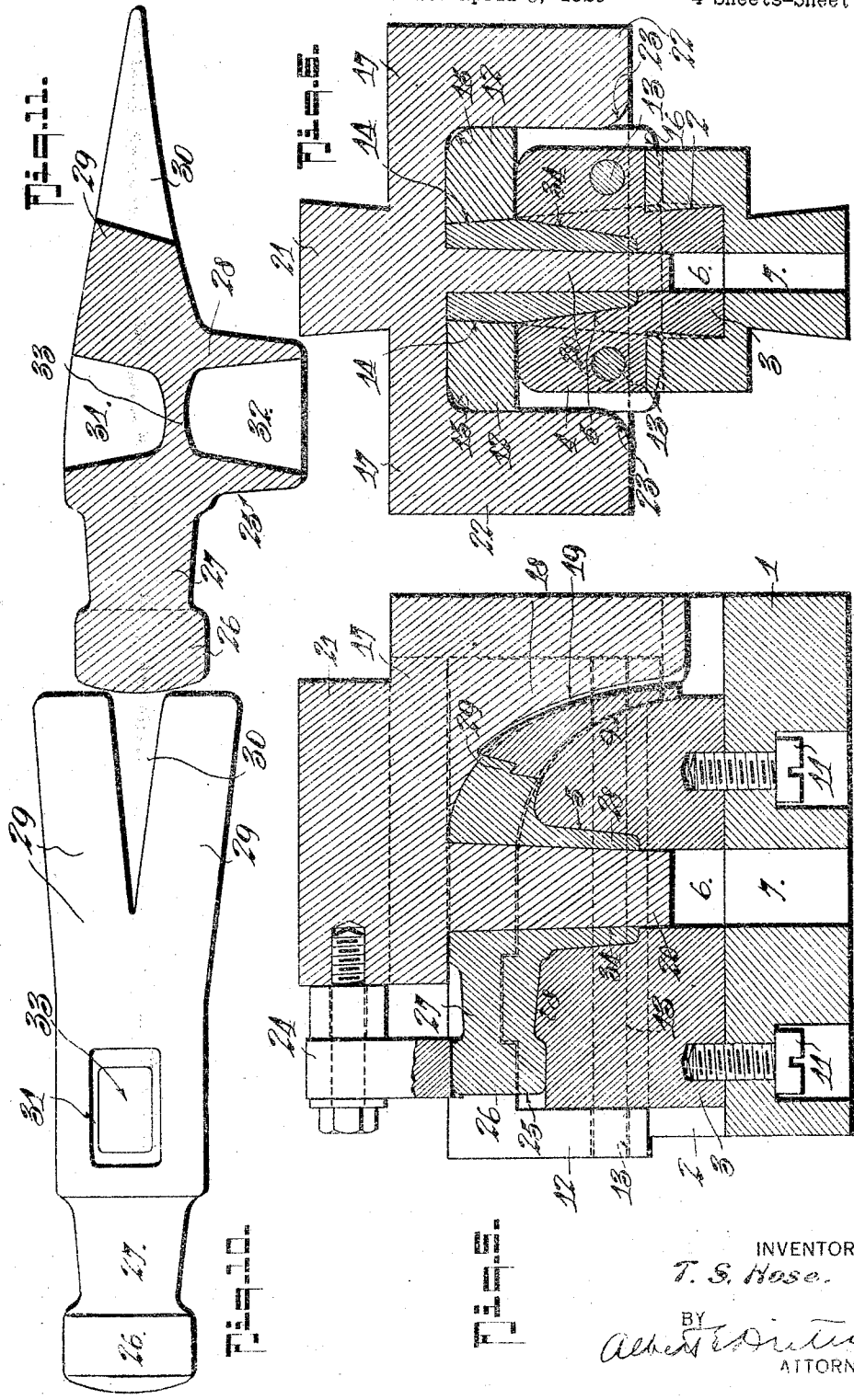
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4 Sheets-Sheet 3



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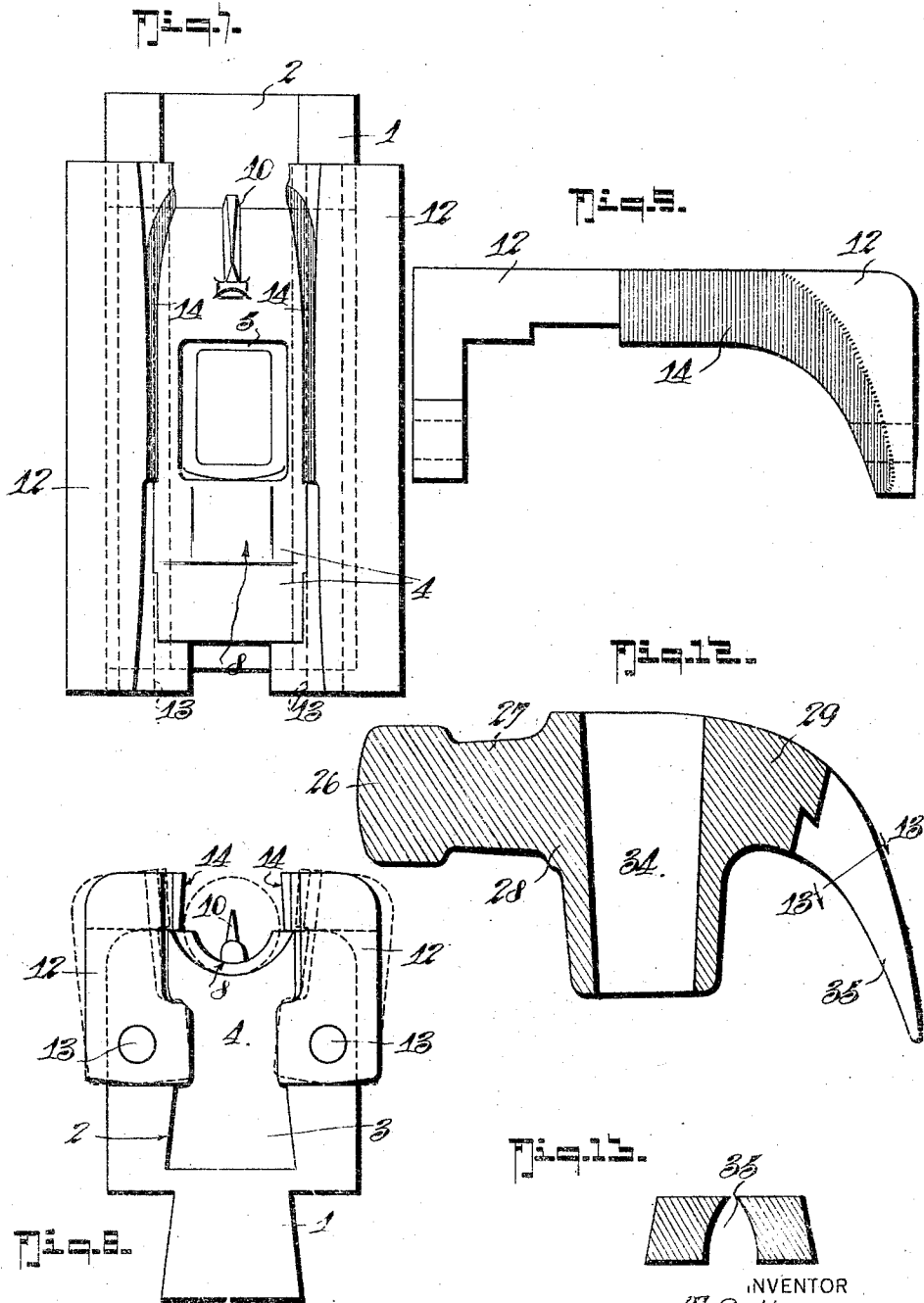
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T. S. HOSE

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4 Sheets-Sheet 4



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# UNITED STATES PATENT OFFICE.

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## DIE FOR FORGING CLAW HAMMERS.

Application filed April 6, 1925. Serial No. 21,191.

*To all whom it may concern:*

Be it known that I, **TITUS S. HOSE**, a citizen of the United States, residing at Little Falls, in the county of Herkimer and State of New York, have invented a new and Improved Die for Forging Claw Hammers, of which the following is a specification.

My invention relates to the art of forging claw hammers and it particularly has for its object to provide means whereby the hammer may be forged without weakening its structure. It is well known that the more steel is heated the more its structure is weakened; therefore, it is of great advantage in preparing claw hammers that they be completed with as few heats as possible. It is the principal object of my invention to provide means whereby the hammer can be completely made in one heat.

Another object is to provide finishing dies of such construction that by their employment the forging operation may be completed with a lower degree of heat than has heretofore been found practical.

Again, it is a known fact that the structure of steel is injured by quick intensive heat caused by grinding operations which are required in trimming the body; therefore, it is another object of my invention to provide means whereby the necessity for grinding operations is reduced to the minimum by finishing the claw with smooth surfaces that will not require any considerable grinding.

A still further object of the invention is to provide a finishing die that will take the blank and in one and the same operation squeeze the eye and claw portions to force the metal thereof to elongate the parts and shape them to the final sizes and forms, and at the same time bending over the claw part to give it the desired curvature, thus eliminating waste of material and trimming the stock to be finished in a single heat.

A further object of the invention is to provide a single-operation-die which has provisions for giving the claws a roll or

curvature that will enable them to grip a headless nail in an effective way.

In carrying out my invention of the present application, I provide a die which is in two major parts or units, one part carrying the eye shaping punch and claw bending over element, while the other part has the socket or cavity for the blank. This other part or unit is itself made of a stationary bed portion and hinged sides, the latter cooperating with the first die part to effect a sidewise squeezing action on the eye and claw body parts of the blank during the coming together of the dies and the punching of the eye, and serving also as grippers to hold the forged hammer to female or lower die while the male die is being separated therefrom until the punch element has been disengaged from the eye.

The invention also resides in those novel features of construction, combination and arrangement of parts hereinafter first fully described, then specifically pointed out in the appended claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of the upper or male die.

Figure 2 is a perspective view of the lower or female die opened up.

Figure 3 is a vertical longitudinal section of the die with its members being brought together and a hammer blank in place and claw partly bent over, the section being taken on the line 3—3 of Figure 4.

Figure 4 is a vertical cross section on the line 4—4 of Figure 3.

Figure 5 is a view similar to Figure 3 with the die closed.

Figure 6 is a view similar to Figure 4 with the parts positioned as shown in Figure 5.

Figure 7 is a plan of the female die opened.

Figure 8 is a front elevation of the female die with the hinged sections in the "closed" position.

Figure 9 is a side elevation of one of the hinged die members.

Figure 10 is a plan view of the blank as it appears prior to insertion into the finishing die.

Figure 11 is a vertical longitudinal section of the blank.

Figure 12 is a vertical longitudinal section of the hammer after removal from the finishing die.

Figure 13 is a cross section on the line 13—13 of Figure 12.

Referring to the accompanying drawings in which like numerals of reference designate like parts in all the figures, 1 represents the bottom holder having a dove-tailed groove 2 to receive the dove-tail 3 of the base die body 4, the parts 1 and 3 being secured together by screws 11. The base die body 4 has a hammer eye-body receiving and forming cavity and a passage 6 to register with a similar passage 7 in the bottom holder 1, through which passages 6 and 7 the excess metal is punched from the hammer blank.

8 designates the upper die face of the base body 4 on which the hammer blank rests and it includes a curved portion 9 against which the claws of the hammer are bent by the bending die hereinafter referred to.

10 is a rib on the base die body 4, the purpose of which is to maintain the split in the hammer blank and also to give the proper curvature or form to the underside of the claws when the die parts are closed. 12 designates a pair of pivoted side die members that are mounted on pivot pins or rods 13 carried by the base body 4 and they are adapted to be swung to either an open (Figure 4) or a closed (Figure 6) position automatically as the upper die descends. The pivoted side die members 12 have rounded or bevelled portions 15 to cooperate with similar portions 23 on the upper die block 17. The side die members 12 have hammer eye-body and claw engaging and pressing surfaces 14 shaped to conform to the outline of the side of the hammer where it contacts with the die members 12.

16 designates stops limiting the opening swinging movement of the side die members 12.

The upper die member or block 17 is provided with a claw bending die heel 18 that is channeled at 19 to receive the rib 10 when the upper and lower dies are closed together. The upper die member also includes a punch 20 which is adapted to give form to the eye opening of the hammer and to punch out the thin web 33 in the blank which separates the upper and lower recesses 31 and 32 in a manner more clearly understood later. The upper die member 17 has a dove tailed body 21 by means of which it may be secured in the upper plunger of the press and it has

side members 22 to cooperate with the hinged die members 12, as will later be made more clear.

24 is an adjustable gauge or stop member that is adapted, when the dies are closed, to engage the head 26 of the hammer blank and to adjust the hang of the hammer.

25 designates the hammer blank as it comes from the forging die. The hammer blank has had the head 26 and neck 27 finished, the eye-body 28 partly formed and the claws 29 slit or split as at 30. It has also had the plurality of relatively shallow recesses 31 and 32 formed by the forging die.

34 designates the finished eye opening of the hammer and 35 the finished under surfaces of the claws.

In utilizing my invention I take the hammer blank shown in Figures 10 and 11 as it comes from the forging die and operate on it by means of my finishing and bending die. The hammer blank is forged with an extremely short eye, thus lengthening the life of the forging die (not shown). After the blank has been forged in the forging die and the split made, the forging is trimmed in the usual way, the web being punched between the claws at the same time. Then the blank is placed, while still hot, on the base die body 4 and the upper die member is brought down as indicated in Figure 3. As the upper die member comes down on the blank, the claw bending heel 18 will engage the claw portion of the blank, while the punch 20 will enter the recess or cavity 31. As the upper and lower dies are brought together the surfaces 23 and 15 will come in contact and cause the side dies 12 to be swung to the closed position. It should be stated that the hammer blank as it comes from the forging die has its sides inclined approximately a ten degree inclination from the flash which is a greater degree than can be used by other methods. The side dies 12 have their contacting surfaces 14 inclined to reduce this degree from approximately ten degrees to approximately one and one-half degrees, forcing the stock into the claw to lengthen it and into the eye-body to lengthen it. Thus the closing pressure on the side dies 15 serves to squeeze the sides of the hammer, thus smoothing them and saving at least twenty-five per cent in the grinding operation necessary to flatten the sides of the hammer.

Furthermore by inclining the faces 14 to converge slightly upwardly or away from the flash line, the side members 12 serve as grippers or strippers to hold the hammer on the lower die while the upper die is being raised to withdraw the punch 20, thereby leaving the hammer on the lower die from which it can be readily taken off by the attendant.

After the hammer blank has been placed on the die the press is tripped and the punch 20 and back die 18 are lowered by the stroke of the press. The punch pushes out the web 33 and bends the claw part over to the final position or form it is to have. The action of the punch lengthens the eye of the blank to the length required in the finished hammer, and as before intimated, cuts off the surplus material and forces the same through the passages 6 and 7 and gives the proper taper to the eye-hole of the finished hammer. As the upper die is raised the hinged side dies will fall to their open position by gravity as the pins 13 are set so that the center of gravity of the side dies will cause them to open when the upper die has been raised.

It will be noted from the foregoing that the entire claw hammer is completed, so far as forging is concerned, in one heat and instead of drawing the eye out to its completed length in the initial forging procedure the shallow eye only is forged and that is elongated when the blank is put in the die which constitutes my present invention.

It will also be noted that as the side dies and the hole for the eye of the hammer are positive, the excess stock cannot bulge out on the sides but must go through the hole below the punch.

Actual practice with my invention has proven a saving of twenty-five percent in the cost of grinding hammers, as all that is really necessary is to clean up the forging after it leaves my punching and finishing die.

By the use of my invention also a saving in drop hammer dies is obtained since by using a short-eye rather than to have to draw the eye out to its finished length a drop hammer die will last considerably longer than heretofore; by using my present invention I find that I can forge, bend, and, in other words, complete the forging operation of a claw hammer in one heat with one man at the rate of the same number of hammers per hour than can be completed with three men with two fires, one man forging and two men bending by the old method. I therefore effect a great saving in oil and labor since I am enabled to use the excess metal to draw out the eye and elongate the claws; I can save waste which would otherwise go out as scrap; I find in actual practice a saving of from fifteen to twenty percent in pounds of steel per dozen hammers.

Another advantage resulting from my invention is the production of a better hammer due to the fact that injury to the structure of the steel caused by excessive heats is avoided. Furthermore because of positive shaping of the hammer a material saving of labor can be effected in the grinding opera-

tions, and because of the fact that the dies are positive all hammers will be the same, thus enabling the production of a better class of work than by the method which depends upon the eye of the operator to secure uniformity of production.

It will also be noticed that in the use of my invention the upper die not only bends the claws down but, acting in conjunction with the side dies, squeezes the top of the hammer down to elongate the claws. Furthermore in this way by shaping the rib the underside of the claws may be pressed to a concaviture, thereby producing a hammer, the claws of which can be used to grip a headless nail as well as a nail having the usual head.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the complete construction, operation and advantages of my invention will be clear to those skilled in the art to which it relates.

What I claim is:

1. A bending and swaging die for making claw hammers, comprising a base unit and a plunger unit, said base unit having a bed to receive the blank, said bed having a shaping cavity for the eye part of the hammer, side die members mounted on the bed and adapted to be moved toward the blank and pressed against the sides thereof, said base having means to maintain the split of the claws and shape its under surfaces, said plunger having an eye punch adapted to cooperate with the base unit in opening the eye and elongating the eye-body of the blank to give it its final form and size, said plunger also having a claw bending die part, and having means to squeeze said side die members against the sides of the blank.

2. A bending and swaging die for making claw hammers, comprising a base unit and a plunger unit, said base unit having a bed to receive the blank, said bed having a shaping cavity for the eye part of the hammer, side die members mounted on the bed and adapted to be moved toward the blank and pressed against the sides thereof, said base having means to maintain the split of the claws and shape its under surfaces, said plunger having an eye punch adapted to cooperate with the base unit in opening the eye and elongating the eye-body of the blank to give it its final form and size, said plunger also having a claw bending die part, and having means to squeeze said side die members against the sides of the blank, said side die members being hinged to said bed.

3. A bending and swaging die for making claw hammers, comprising a base die body shaped to receive the blank and having a cavity for the reception of the eye part of the blank, side die members hingedly mounted on the base body and adapted to be

swung toward the blank and pressed against the sides thereof, said base having means to maintain the split of the claws and shape its under surfaces, an upper die block carrying a claw bending die heel and a punch, said punch adapted to open the eye of the blank and force the metal of the blank to elongate the eye-body and give to it its final form and size as the upper and lower die members are brought together, said upper die block having members to engage said hingedly mounted side die members and close them on the blank to grip the same for the purposes described.

4. A bending and swaging die for making claw hammers, comprising a top and a bottom unit with cooperating die surfaces, the top unit having a punch to open and shape the eye of the hammer blank, and a portion to engage and bend the claws of the blank, the bottom unit having a cavity to receive the lower portion of the eye of the blank, and means on the bottom unit and co-operating with the top unit to strip the hammer from the punch as the die units are separated.

5. A bending and swaging die for making claw hammers, comprising a top and a bottom unit with cooperating die surfaces, the top unit having a punch to open and shape the eye of the hammer blank, and a portion to engage and bend the claws of the blank, means to strip the hammer from the punch as the die units are separated, said means comprising side dies hinged to and constituting a part of the bottom unit, and means on the top unit to hold said side dies in engagement with the hammer until the top unit has been raised sufficiently to free the punch from the work.

6. A bending and swaging die for making claw hammers, comprising means to receive and hold a hammer blank, a punch to open the eye and shape the same, a bending die element to engage and bend over the claws of the blank while the eye is being punched, and means to hold the finished article to strip it loose from the punch.

7. A bending and swaging die which comprises a base having an eye cavity shaped to the size of the finished hammer eye-body and having a split retaining rib and a claw shaping die surface; side dies, at least one of which is movably mounted on the base and adapted to exert side pressure against the blank, the upper die having means operating during movement in one direction to close the side dies against the blank, bend over the claws, punch out the eye, and shape the eye, all in one operation.

8. A bending and swaging die which comprises a base having an eye cavity shaped to the size of the finished hammer eye-body and having a split retaining rib and a claw shaping die surface; side dies, at least one

of which is movably mounted on the base and adapted to exert side pressure against the blank, the upper die having means operating during movement in one direction to close the side dies against the blank, bend over the claws, punch out the eye, and shape the eye, all in one operation, said side dies being hinged to the base and having their opposing faces inclined toward one another to act as grippers of the hammer while the punch is being withdrawn, thereby to strip the hammer from the punch and other parts of the upper die.

9. A bending and swaging die which comprises a base having an eye cavity shaped to the size of the finished hammer eye-body and having a split retaining rib and a claw shaping die surface; side dies, at least one of which is movably mounted on the base and adapted to exert side pressure against the blank, the upper die having means operating during movement in one direction to close the side dies against the blank, bend over the claws, punch out the eye, and shape the eye, all in one operation, said side dies being hinged to the base and having their opposing faces inclined toward one another, said upper die being adapted to fit over said side dies to hold them together while the punch is being operated and the bending takes place and until the punch is withdrawn from engagement with the eye.

10. In dies for forging claw hammers, the combination with upper and lower eye-punch-and-claw-bending units, of means to exert side gripping pressure on the stock.

11. In dies for forging claw hammers, the combination with upper and lower eye-punch-and-claw-bending units, of means to exert side gripping pressure on the stock, said means having provision to act as a stripper device to release the stock from the punch part of the die.

12. A die for forging claw hammers which comprises a bottom unit and a top unit, said units being adapted to be brought together and each having operating die surfaces to bend the claws and shape the blank to the final form and size, said top unit having an eye-punch, said bottom unit including a stationary body having an eye-body recess and punching's discharge passage, and said side sections being hinged to said stationary body, and said top unit having gripping portions to fit over said hinged sections and draw them together with pressure contact against the sides of the eye-body and claws of the blank during the punching and bending operations.

13. A die for forging claw hammers which comprises a bottom unit and a top unit, said units being adapted to be brought together and each having operating die surfaces to bend the claws and shape the blank to the final form and size, said top



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unit having an eye-punch, said bottom unit including a stationary body having an eye-body recess and punching's discharge passage, and said side sections being hinged to said stationary body, and said top unit having gripping portions to fit over said hinged sections and draw them together with pressure contact against the sides of the eye-body and claws of the blank during the punching and bending operations, said stationary body having claw-split maintaining and claw-shaping die portions adapted to cooperate with a mating die portion on the top unit to swage the claws with a converging under surface for the purpose specified.

TITUS SHEARD HOSE.