L. O. HENGGI.

FORMING TOOL.

APPLICATION FILED MAY 19, 1914.

1,313,380. Patented Aug. 19, 1919.

Fig. 1.

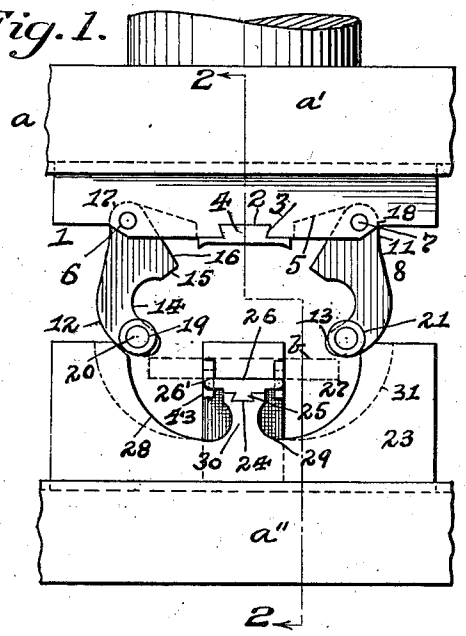


Fig. 3.

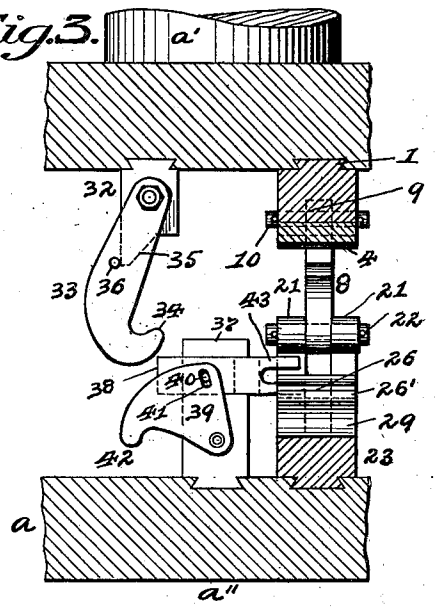


Fig. 2.

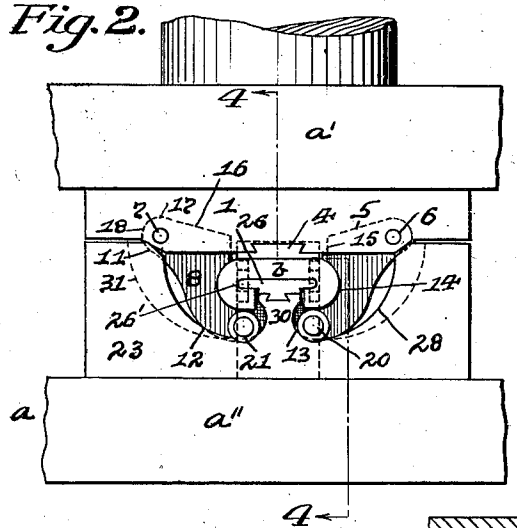


Fig. 4.

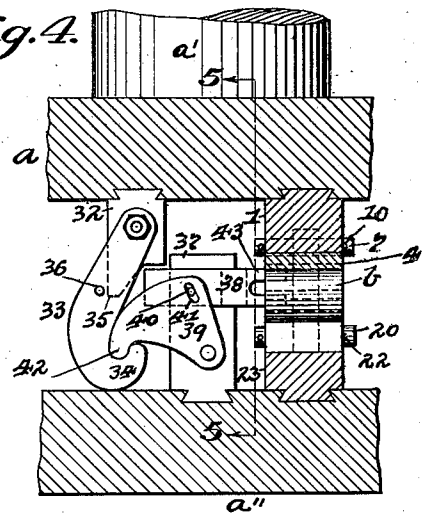


Fig. 5.

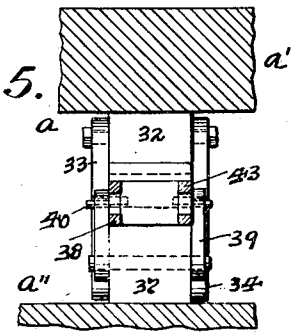
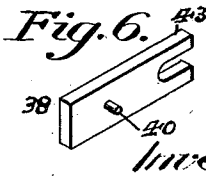


Fig. 6.



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UNITED STATES PATENT OFFICE.

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FORMING-TOOL.

1,313,380. Specification of Letters Patent. Patented Aug. 19, 1919.

Application filed May 19, 1914. Serial No. 839,535.

To all whom it may concern:

Be it known that I, LEWIS O. HENGGI, a citizen of the United States, and a resident of Oakmont, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Forming-Tools; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to forming tools and particularly to forming tools used in conjunction with dies for bending metal into irregular forms such as curved or double hooked shapes and for removing the same from the press after the same has been formed into the desired shape.

The object of my invention is to provide a cheap, simple and efficient form of forming tool which with a single operation will bend a piece of metal over a die of any desired shape and then push the same from over the die and away from the press so that the entire operation will take but one operation of the press and there will be no necessity of having the formed metal article removed from the die by hand.

My invention consists, generally stated, in the novel arrangement, construction and combination of parts as hereinafter more specifically set forth and described and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use my improved forming tool I will describe the same more fully referring to the accompanying drawing in which:—

Figure 1 is a partial side view of a press showing my improved forming tool in a position ready for operation.

Fig. 2 is a like view showing the parts after the upper die has been lowered to form the metal.

Fig. 3 is an end view of a portion of the press showing the kicker die for removing the formed metal from the press, and taken partly in section on the line 2—2 Fig. 1 looking in the direction of the arrows.

Fig. 4 is a sectional view showing the upper die in its lowered position with the hooks and dogs engaging for operating the kicker die, and taken on line 4—4 Fig. 2.

Fig. 5 is a sectional view on the line 5—5 of Fig. 4 looking in the direction of the arrows.

Fig. 6 is a detail of one of the kickers.

Like symbols of reference herein indicate like parts in each of the figures of the drawing.

As illustrated in the drawing the upper die 1 consists of a substantially heavy body which is connected to the movable head a' of the press a in the ordinary manner and such body is provided with a dovetail slot 2 for receiving the dovetail 3 of a die 4 which is located in the center of said body. The die body 1 is further provided on each side of the die 4 with a recess 5 which extends upward from the lower face of the same and has a hole 6 extending from the sides of said body into said recess for the purpose of receiving a pin 7 which secures a wing member 8 in said recess.

The wing member 8 is provided with a hole 9 for being secured in the recess 5 of the die body 1 by the pin 7 and said pin is prevented from leaving its position by cotter pins 10 extending through each end of of the same or by any other suitable means. The outer face of the wing member 8 has a straight portion 11 and a curved portion 12 terminating in a rounded end 13 at the bottom of the same while the inner face of said member is curved inwardly as at 14. Above the curved portion 14 is a short straight portion 15 and a tapered portion 16 which terminates in a rounded upper end 17.

The recess 5 in the die body 1 conforms to the shape of the upper end of the wing member 8 while said member, when the upper die is in its initial or raised position bears with its outer straight portion 11 against the outer wall 18 of said recess in order to hold the same in its proper position.

The lower end of the wing member 8 is provided with a hole 19 for receiving a pin 20 while a roller 21 on each side of said wing member operates on said pin and is prevented from leaving the same by means of cotter pins 22 passing through the ends of said pin.

The lower die body 23 on the base a'' of the press a has a dovetail slot 24 extending through the center of the same for receiving the dovetail 25 of the die 26 and said die is located some distance below the top of the body 23 as later explained. The form of die 26 shown on the drawing has a flat upper surface with rounded extensions 26′ while on each side of the same the body 23 is cut out in order to form pockets 27. These pockets 27 have a curved outer face 28 which terminates in rounded

portions 29 below the die 26 so as to form a standard 30 for said die while each of said pockets is provided with a groove 31 as later explained.

Secured near the upper body 1 and at one side of the same is a support 32 which carries a hook member 33 at each side of the same and said hooks are pivotally mounted on said support with their hook ends 34 on the side next to the body 1. The support 32 is provided with a downwardly extending portion 35 for being engaged by a stop 36 on the hook member 33 in order to hold the same in position.

Near the lower body 23 or formed integrally therewith is a slide die 37 for carrying a kicker die 38 and said kicker die has a dog 39 connected therewith on each side of the same by means of a bolt 40 on said die engaging a suitable slot 41 on said dogs. The dog 39 is also pivotally secured at its lower end with the slide die 37 while the outer end of said dog is provided with a hook portion 42 which extends downward as later explained. The kicker die 38 has four inwardly extending arms 43 which are positioned one above and one below each of the rounded extensions 26'.

The operation of my improved forming tool is as follows:—Considering the press in a position such as shown in Fig. 1 with the upper die in its raised position and with the piece of metal *b* resting on the lower die as shown. The upper die is now lowered and the rollers 21 on the wing members 8 travel along the curved outer faces of the pockets 27 while the grooves 31 take care of the extending parts of said wings so that said rollers will engage said outer faces during their entire course of travel.

As the wing members 8 thus enter the pockets 27 in the body 23 the rounded ends 13 of said members will engage the ends of the metal *b* and press the same into said pockets and as said members continue their course in said pockets they will bend the ends of said metal around the rounded extensions 26' at which time the rounded ends 13 will rest in rounded portions 29 in said pockets as shown in Fig. 2. The top die 4 will strike against the metal *b* on the lower die 26 in order to give the same the proper shape.

During the operation of the press above described the hook members 33 have been traveling downward with the body 1 and the hook ends 34 strike the dogs 39 and are pressed outward so that as the upper die reaches the end of its downward stroke said hook members will fall by virtue of their own weight to such a position that their hook ends 34 will be directly below the hook portion 42 on the dogs 39.

As the upper body 1 is raised the hook ends 34 on the members 33 will engage with the hook portions 42 on the dogs 39 and raise the same and as such dogs are securely pivoted on the slide die 37 the upper ends of said dogs will be pressed toward the body 23 and the kicker die 38 will be moved toward the die 26 where it will strike the formed metal *b* with its arms 43 and remove the same from around said die. After traveling a short distance in order to remove the formed metal *b* the hook end 34 and hook portion 42 will disengage and the action of gravity on the dogs 39 will return them and the kicker dies to their initial position.

It will thus be seen that with the use of my improved forming tool curved or double hooked articles may be made and removed from the press with one operation so that the output will be greatly increased and the cost lessened.

It will also be seen that various shaped articles may be formed by changing the course of travel of the wing members or the dies used and various modifications and changes in the design, construction and operation of my improved forming tool may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having guiding pockets on each side of the same, grooves in the faces of said pockets, means on said upper body portion engaging with said faces, said means being adapted to partially enter said grooves, and means for regulating the amount of said first named means entering said grooves, said first named means being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same.

2. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having guiding pockets on each side of the same, grooves in the faces of said pockets, pivoted means on said upper body portion engaging with said faces, said pivoted means being adapted to partially enter said grooves, and means for regulating the amount of said pivoted means entering said grooves, said pivoted means being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same.

3. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having curved guiding pockets on each side of the same,

grooves in the curved faces of said pockets, and pivoted wing members on said upper body portion having rollers for engaging with the curved faces of said pockets, said members being adapted to partially enter said grooves to permit said rollers to engage said curved faces during their entire course of travel, said members being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same.

4. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having guiding pockets on each side of the same, grooves in the faces of said pockets, means on said upper body portion engaging with said faces, said means being adapted to partially enter said grooves, means for regulating the amount of said first named means entering said grooves, said first named means being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same, and means for removing the formed metal from said lower die.

5. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having guiding pockets on each side of the same, grooves in the faces of said pockets, pivoted means on said upper body portion engaging with said faces, said pivoted means being adapted to partially enter said grooves, means for regulating the amount of said pivoted means entering said grooves, said pivoted means being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same, and means for removing the formed metal from said lower die.

6. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having curved guiding pockets on each of the grooves in the curved faces of said pockets, pivoted wing members on said upper body portion having rollers for engaging with the curved faces of said pockets, said members being adapted to partially enter said grooves to permit said rollers to engage said curved faces during their entire course of travel, said members being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same, and means for removing the formed metal from said lower die.

7. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having guiding pockets on each side of the same, grooves in the faces of said pockets, means on said upper body portion engaging with said faces, said means being adapted to partially enter said grooves, means for regulating the amount of said first named means entering said grooves, said first named means being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same, and an ejector having a dog adapted to engage a hook member to remove the formed metal from said lower die during the upward stroke of said movable head.

8. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having guiding pockets on each side of the same, grooves in the faces of said pockets, pivoted means on said upper body portion engaging with said faces, said pivoted means being adapted to partially enter said grooves, means for regulating the amount of said pivoted means entering said grooves, said pivoted means being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same, and an ejector having a dog adapted to engage a hook member to remove the formed metal from said lower die during the upward stroke of said movable head.

9. A forming tool for use with a press having a movable head, comprising an upper body portion carrying a die, a lower body portion carrying a die and having curved guiding pockets on each side of the same, grooves in the curved faces of said pockets, pivoted wing members on said upper body portion having rollers for engaging with the curved faces of said pockets, said members being adapted to partially enter said grooves to permit said rollers to engage said curved faces during their entire course of travel, said members being adapted to engage with metal to be formed and to enter said pockets in order to bend said metal over said lower die to form the same, and an ejector having a dog adapted to engage a hook member to remove the formed metal from said lower die during the upward stroke of said movable head.

In testimony whereof I, the said LEWIS O. HENGGI, have hereunto set my hand.

LEWIS O. HENGGI.

Witnesses:
T. B. HUMPHRIES,
J. N. COOKE.