I. FLEMING AND H. S. HILL.

MACHINE FOR CUTTING VENTS IN AUTOMOBILE HOODS.

APPLICATION FILED AUG. 6, 1919.

1,353,524. Patented Sept. 21, 1920.

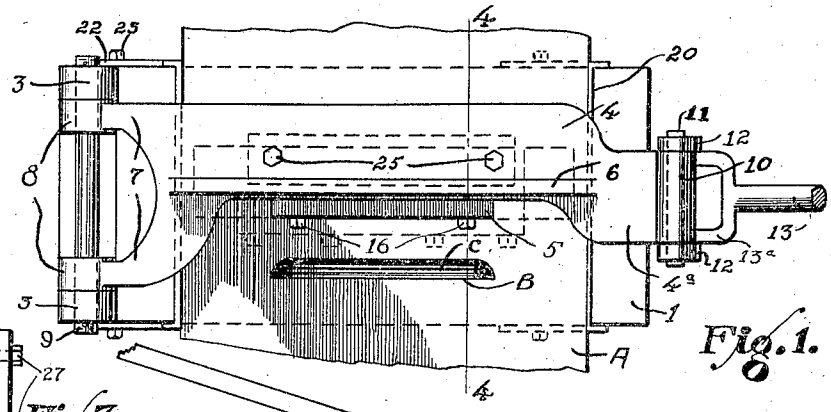


Fig. 1.

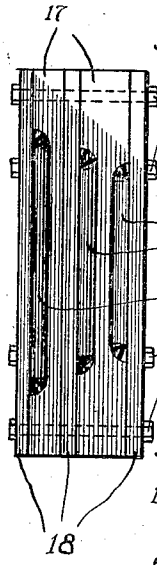


Fig. 7.

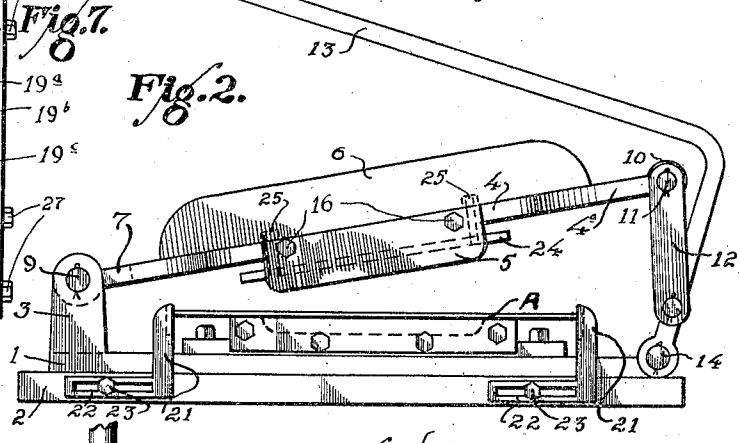


Fig. 2.

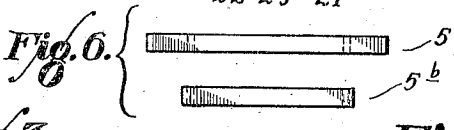


Fig. 6.

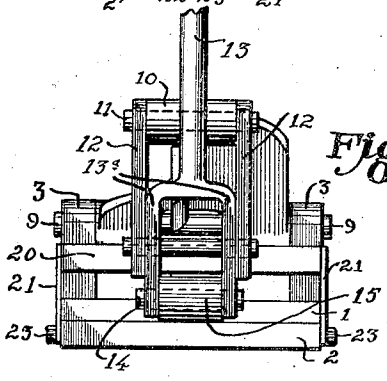


Fig. 3.

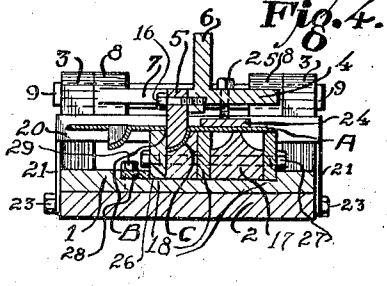


Fig. 4.

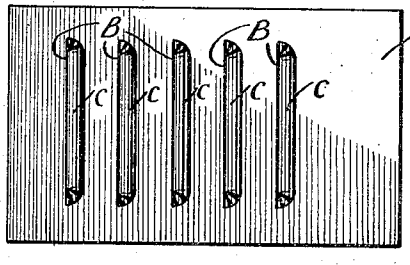


Fig. 5.

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UNITED STATES PATENT OFFICE.

ISAAC FLEMING AND HUGH S. HILL, OF LOS ANGELES, CALIFORNIA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO JOSEPH J. MATHE, OF LOS ANGELES, CALIFORNIA.

MACHINE FOR CUTTING VENTS IN AUTOMOBILE-HOODS.

1,353,524. Specification of Letters Patent. Patented Sept. 21, 1920.

Application filed August 6, 1919. Serial No. 315,666.

To all whom it may concern:

Be it known that we, ISAAC FLEMING and HUGH S. HILL, both citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have jointly invented new and useful Improvements in Machines for Cutting Vents in Automobile-Hoods, of which the following is a specification.

The present invention relates to a machine for cutting vents or louvers in sheet metal articles such as the hoods of automobiles, such vents being commonly provided to facilitate a free circulation of air around the engine and to prevent the heated air from passing back into the body of the vehicle, the object of the invention being to provide a device of this character which embodies novel features of construction whereby the vents or louvers can be quickly and inexpensively formed in the sheet metal with a minimum amount of labor and with a very small outlay of capital for machinery.

Further objects of the invention are to provide a machine of this character which is simple and inexpensive in its construction, which requires but a small amount of floor space, which can be operated by a single workman, which will withstand the heavy strains to which it is subjected in use without danger of being broken or twisted out of shape, and in which different cutting and shaping members are interchangeable so that proper adjustment can be made for forming different sizes and shapes of vents.

With these and other objects in view, as will more fully appear as the description proceeds, the invention consists in certain combinations, arrangements and associations of parts, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention reference is to be had to the following description and accompanying drawing in which:

Figure 1 is a top plan view of a vent cutting machine constructed in accordance with the invention, a sheet metal blank which has been partially operated upon being shown in operative position within the machine and the handle being broken away;

Fig. 2 is a side elevation of the machine with the handle swung upwardly and the movable cutter and shaping element elevated into inoperative position;

Fig. 3 is an end view of the same, the upper end of the handle being broken away;

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1;

Fig. 5 is a plan view of a sheet metal blank in which a series of vents or louvers have been formed by the machine;

Fig. 6 is a detail view of two cutting and shaping bars which are adapted to be used interchangeably with the one shown by Figs. 1 and 2; and,

Fig. 7 is an enlarged plan view of the die block which is adjustably mounted on the bed plate.

Corresponding and like parts are referred to in the following description and indicated in all of the views of the drawing by like reference characters.

Specifically describing the present embodiment of the invention, the numeral 1 designates a bed plate which may rest upon any suitable support such as the block 2 and which is provided at one end thereof with a pair of spaced standards 3. An elongated swinging arm 4 is mounted over the bed plate 1 and has a combined cutting and shaping element 5 secured to one of the longitudinal edges thereof. At a point adjacent this edge the swinging arm is reinforced and strengthened by an upstanding reinforcing rib 6. The pivot end of the swinging arm 4 is bifurcated, one of the arms 7 of the bifurcation being in substantial alinement with the edge of the swinging arm which is remote from the cutting and shaping element 5, while the other arm 7 of the bifurcation is offset laterally from the edge of the swinging arm to which the cutting and shaping element is fastened. The two arms 7 of the bifurcation terminate in pivot eyes 8 which are engaged by a bolt 9 connecting the standards 3 of the bed plate.

The swinging end of the arm 4 is offset laterally at 4^a and terminates in a transverse sleeve 10 within which a pivot bolt 11 is fitted, the extremities of the pivot bolt being connected by a pair of links 12 to the bifurcated end 13^a of an L-shaped operating lever 13. This operating lever is fulcrumed upon a pivot bolt 14 passing through a sleeve 15 at the end of the bed plate 1. The L-shaped formation of the operating lever

causes it to swing forwardly over the top of the machine when it is in inoperative position, as indicated by Fig. 2. At the same time, a very powerful leverage is obtained for operating the machine when the lever is swung outwardly and downwardly to move the swinging arm 4 toward the bed plate 1. It will be noted that the edge of the swinging arm 4 to which the cutting and shaping element 5 is secured is arranged in a line which passes longitudinally through the offset portion 4^a of the swinging end of the arm at substantially the middle point thereof, and which also passes through the bifurcated pivot end of the swinging arm at substantially the middle point thereof. The heavy strains which would be due to an offset arrangement of the cutting and shaping element 5 are thus avoided and the said cutting and shaping element is positioned in such a manner as to provide for as even a distribution of the heavy strains as is possible.

The fixed cutter and shaping element which are provided for coöperation with the movable cutting and shaping element 5 are mounted upon the bed plate 1, and the sheet metal article A which is to be operated upon is intermittently moved across the top of the said members as the machine is operated. The cutting and shaping element 5 is detachably secured to the arm 4 by suitable fastening means such as the screws 16, and these cutting and shaping elements may be furnished in different lengths and thicknesses so that provision can be made for cutting different lengths and widths of vents or louvers. An equipment which would be useful in many small shops would include three different lengths of the cutting and shaping element 5. Fig. 6 shows cutting and shaping elements 5^a and 5^b which are of different lengths and can be used interchangeably with the cutting and shaping element 5, thereby enabling adjustment to be made for cutting three different lengths of vents. Of course many other shapes and sizes of cutting and shaping elements may be used interchangeably, if desired.

The fixed cutting and die elements are adjustable to coöperate with the particular cutting and shaping element which is mounted upon the swinging arm 4. In the present instance the fixed member which is arranged upon the bed plate 1 includes a pair of shaping blocks 17 having a knife bar 18 interposed between the same, and knife bars 18 applied to the outer sides thereof. The blocks 17 are provided in edge portions thereof with die openings or shaping recesses 19^a, 19^b and 19^c which are of different lengths and properly shaped for coöperation with the different cutting and shaping elements 5, 5^a and 5^b. The members 17 and 18 can be positioned upon the bed plate 1 to hold any one of the die openings 19^a, 19^b or 19^c and the corresponding knife bar 18 in proper position for coöperation with the cutting and shaping element on the swinging arm 4 to cut a slit B in the sheet metal blank A and simultaneously press out and shape an edge portion of the slit to form a louver C each time the operating lever 13 is swung downwardly. By reference to Fig. 4 it will be observed that the cutting and shaping element 5 has a thickness corresponding to the width of the louver C to be formed, and that one edge thereof is sharp for coöperation with the knife bar 18 to slit the sheet metal, while the other edge thereof is rounded and shaped to form a punch which will coöperate with the die opening or recess of the block 17 to shape the sheet metal on one side of the slit and form a louver C. The sheet metal blank A is advanced step by step between the operations of the machine, and a series of vents or louvers may be formed, as indicated by Fig. 5.

Suitable gage or guide strips 20 may be provided for directing the sheet metal blank A as it is moved through the machine, thereby enabling the several vents or louvers C to be formed in the proper relation to each other. These guide strips 20 extend transversely across the bed plate 1 and are supported by uprights 21 at the extremities thereof, said uprights being formed with slotted arms 22 which project laterally from the lower ends thereof and are adjustably connected to the block 2 by means of the screws 23. This arrangement enables the guide strips to be moved toward and away from each other and properly adjusted to direct the particular sheet metal blank A being operated upon through the machine in the proper manner.

Arranged under the swinging arm 4 and at one side of the cutting and shaping element 5 is a pressure foot and stop 24 which is adjustably supported from the swinging arm by the screws 25. By suitably manipulating these screws the pressure foot can be moved toward and away from the swinging arm and properly adjusted. In the operation of the machine this pressure foot 24 engages the portion of the sheet metal blank A adjacent to the slit and presses the same against the die block, thereby smoothing out and removing any bulges or wrinkles which might have a tendency to form in the sheet metal blank at the time the fin or louver C is pressed therefrom. The smoothness of the body is thus preserved and a clear-cut stamping action obtained in forming the vents.

The fixed die block which, in the present instance, is a composite of the two blocks 17 and three knife bars 18, may be conveniently positioned in the proper manner

by fitting it in a recess 26 in the upper surface of the bed plate 1. The several members 17 and 18 may be held together by the tie bolts 27 so as to form a single member which can be handled as a unit. The recess 26 has a width greater than that of the composite die member, and a filler strip 28 is fitted in one side of the recess to hold the composite die block in position. Suitable fastening members such as the screws 29 may be utilized to hold the filler strip 28 in position. The composite die block may be bodily lifted out of position and reversed to bring either one of the outer knife bars 18 and die openings 19^a, or 19^c into operative position. In order to bring the intermediate knife bar 18 and die opening 19^b into operative position the composite die block is shifted laterally in the recess 26 by removing the filler strip 28 and replacing it in the opposite side of the recess after the necessary adjustment of the composite die block has taken place. It will be understood, of course, that when one of the knife bars and die blocks is placed in operative position, the corresponding one of the cutting and shaping elements 5, 5^a or 5^b must be applied to the swinging arm 4. This construction admits of the necessary adjustment being quickly made for cutting and stamping the different sizes of vents or louvers which are ordinarily found desirable when working upon automobile hoods. Each time the lever is operated the sheet metal blank will have a slit cut therein and the portion of the metal at one side of the slit pressed downwardly and shaped to form a louver. This lever may be operated by hand power, foot power, or by machine, as may be found most desirable.

While we have illustrated and described one particular embodiment of our invention, it will be understood that numerous changes and modifications can be made therein without departing from the scope and intent of the invention as defined by the appended claims.

Having thus disclosed our invention, we claim and desire to secure by Letters Patent:

1. A machine of the character described, including a bed plate, a swinging arm arranged over the bed plate and pivotally connected at one end thereto, an operating lever pivotally connected to the bed plate and having an operative connection with the swinging arm, a coöperating cutting bar upon the bed plate, and a separate die block arranged upon the bed plate and fitted against the cutting bar, the edge portion of the die block adjacent the cutting bar being recessed to receive the cutting and shaping element and coöperate therewith to form a louver at one side of the slit.

2. A machine of the character described, including a bed plate, a swinging arm arranged over the bed plate and pivotally connected at one end thereto, an operating lever pivotally connected to the bed plate and operatively connected to the swinging arm, a combined cutting and shaping element applied to the swinging arm and having one edge thereof sharp to provide a cutter while the other edge is rounded to provide a shaper, a cutting bar mounted upon the bed plate in coöperative relation to the cutting edge of the cutting and shaping element, and a die block mounted upon the bed plate and applied to one side of the cutting bar, the edge of the die block adjacent the cutting bar being recessed to provide a die opening to receive the cutting and shaping element.

3. A machine of the character described, including a bed plate, a swinging arm arranged over the bed plate and pivotally connected thereto at one end, an operating lever pivotally connected to the bed plate and having an operative connection with the swinging arm, a combined cutting and shaping bar carried by the swinging arm, a coöperating cutting bar and die member upon the bed plate to engage the cutting and shaping element, and coöperate therewith to slit a sheet metal blank and form a louver at one side of the slit, a guide bar extending transversely across the bed plate for engagement with an edge of the sheet metal blank to hold it in proper position, and means for holding the guide bar adjustably in position.

4. A machine of the character described, including a bed plate, a swinging arm arranged over the bed plate and pivotally connected thereto at one end, an operating lever pivotally connected to the bed plate and having an operative connection with the swinging arm, the pivotal connections at the ends of the swinging arm being offset laterally so that one edge of the swinging arm is in a line extending substantially centrally through the pivotal connections at the ends of the swinging arm, a longitudinally extending reinforcing rib formed upon the swinging arm adjacent to the said edge thereof, a combination cutting and shaping bar applied to the said edge of the swinging arm, and a coöperating cutting bar and die member mounted upon the bed plate.

5. A machine of the character described, including a bed plate, an arm arranged over the bed plate and movable toward and away therefrom, a combined cutting and shaping bar carried by the arm, and a die block mounted upon the bed plate and formed with a series of cutting edges and die recesses, and means for holding the die block in position with any selected one of the cutting edges and die recesses thereof in coöpera-

tive relation with the cutting and shaping bar of the arm.

6. A machine of the character described, including a bed plate, an arm movable toward and away from the bed plate, a series of cutting and shaping bars adapted to be interchangeably applied to the arm, a composite die block mounted upon the bed plate and including a series of alternately arranged knife bars and blocks, the blocks having shaping recesses adjacent the knife bars, and means for positioning the composite die block with any selected knife bar and shaping recess in coöperative relation to the cutting and shaping bar of the arm.

7. A machine of the character described, including a bed plate, an arm movable toward and away from the bed plate, a pair of cutting and shaping bars adapted to be interchangeably applied to the arm, a reversely mounted composite die block having a knife edge and shaping recess at opposite sides thereof, either one of the knife edges and shaping recesses being adapted to be brought into coöperative relation to the cutting and shaping bar of the arm by reversing the position of the die block.

8. A machine of the character described, including a bed plate having a recess therein, an arm movable toward and away from the bed plate, a combination cutting and shaping bar applied to the arm, a die block adjustably fitted within the recess of the bed and provided with a series of knife edges and shaping recesses, and a filler block adapted to be fitted in the recess on either side of the die block to hold the same in adjusted position with the different knife edges and die recesses thereof in coöperative relation to the cutting and shaping bar of the arm.

9. A machine of the character described, including a bed plate, a swinging arm arranged over the bed plate and mounted in connection therewith at one end, an operating lever pivotally connected to the bed plate and having an operative connection with the swinging arm, a coöperating cutting and shaping bar upon the bed plate, and a separate die block arranged upon the bed plate and fitted against the cutting and shaping bar, the edge portion of the die block adjacent the cutting and shaping bar being recessed to receive said bar and coöperate therewith to form a louver at one side of the slit.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

ISAAC FLEMING.
HUGH S. HILL.

Witnesses:
EDNA TURNER,
RAYMOND IVES BLAKESLEE.