(No Model.)

J. A. FACER.

MACHINE FOR FORGING CAR WHEELS.

No. 564,603. Patented July 28, 1896.

FIG. 3.

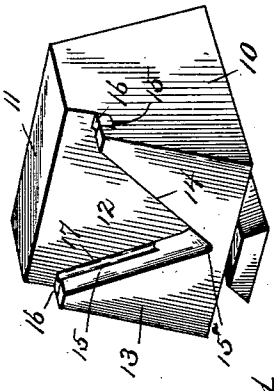


FIG. 4.

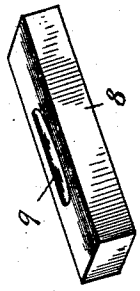


FIG. 5.

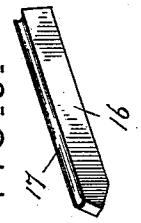


FIG. 2.

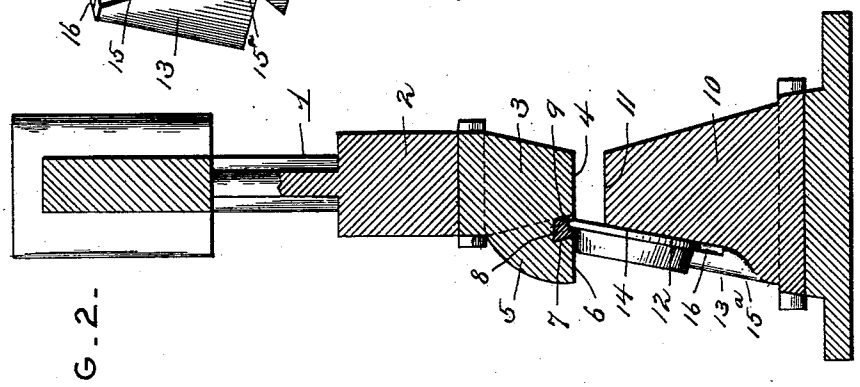
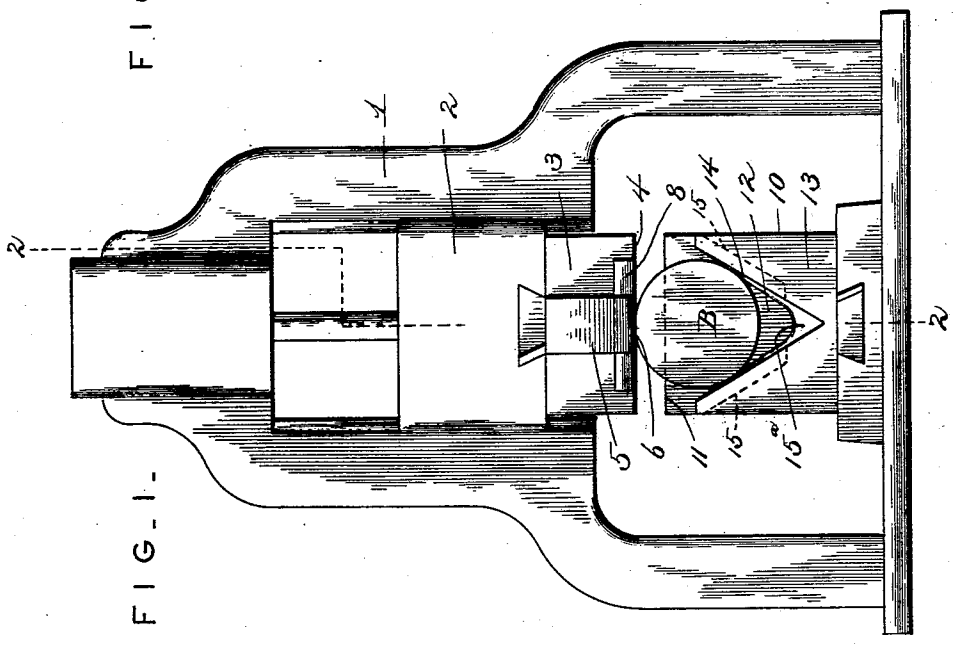


FIG. 1.



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UNITED STATES PATENT OFFICE.

JAMES A. FACER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE FACER FORGED STEEL CAR WHEEL AND LOCOMOTIVE WHEEL COMPANY, OF SAME PLACE.

MACHINE FOR FORGING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 564,603, dated July 28, 1896.

Application filed August 19, 1895. Serial No. 559,809. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. FACER, a citizen of the United States, residing at Philadelphia, (Germantown,) in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Machine for Forging Car-Wheels, of which the following is a specification.

This invention relates to machines for forging car-wheels, and contemplates certain improvements in the dies of such machines, whereby the same shall be rendered more positive, efficient, and durable in operation.

To this end the invention primarily has for its object to provide a new and useful construction of anvil-die for steam-hammers to provide for insuring the proper positioning of the wheel-blank, so that the entire machine will sustain the least possible degree of jarring or straining, while at the same time the wheel-blank will have the strain of hammering equally distributed throughout the same to obviate splitting, cracking, or the formation of other defects.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a front elevation of a steam-hammer the dies of which are constructed in accordance with this invention. Fig. 2 is a vertical sectional view on the line 2 2 of Fig. 1. Fig. 3 is a detail in perspective of the anvil-die. Fig. 4 is a detail in perspective of the renewable die-block for the die projection of the hammer-die. Fig. 5 is a similar view of one of the renewable die-plates for the anvil-die.

Referring to the accompanying drawings, 1 designates an ordinary steam-hammer frame, in which is arranged the vertically-reciprocating steam-actuated hammer 2, to which is connected in the usual manner a hammer-die 3. In the present invention the hammer-die 3 is provided with a flat-bottom die-face 4 and at one side with an offstanding die projection 5. The offstanding die projection 5 of the hammer-die 3 is provided with a flat horizontal die-face 6, which assists in forming the tread of the wheel, and at the inner edge of the flat face 6 the die projection 5 is provided with a dovetailed groove 7, in which is removably fitted a dovetailed renewable die-block 8. The renewable die-block 8 is made of forged steel, which is necessarily more durable than the metal of which the hammer-die and its projection are made, and the lower flat face of the renewable die-block 8, which alines with and forms a partial continuation of the flat die-face 6, is provided directly adjacent to one edge of the bottom die-face 4 of the hammer-die 3 with a flange-groove 9, corresponding in shape and curvature to the flange of the wheel that is to be partially forged into shape by the hammer-die. The depth of the groove 9 in the lower face of the block 8 will of course vary according to the size of the flange to be forged on the wheel-blank, but by reason of the removability of the block 8 the same when worn can be quickly and readily replaced at a comparatively small expense without having to renew the entire casting forming the hammer-die and its projection.

Arranged in a position directly under the hammer-die in the ordinary manner is the anvil-die 10 of the hammer. The anvil-die 10 is provided with a flat top face 11, opposed to the flat face 4 of the hammer-die, and between these two faces 4 and 11 the ingot or bloom of steel is evenly reduced and upset to form the wheel-blank B, such as shown in Fig. 1 of the drawings. The anvil-die 10 is further provided with an inclined side 12, beyond which inclined side is projected an integral offset portion 13.

The integral offset portion 13 of the anvil-die 10 is disposed entirely below the flat top face 11 of the die, and is provided with a V-shaped supporting pocket or notch 14, which is adapted to receive in an upright laterally-inclined position the wheel-blank B, so as to hold the same properly in position while the thread and flange are forged thereon by the reciprocating hammer-die. The V-shaped supporting pocket or notch 14 in the offset

portion 13 is sufficiently deep to accommodate the wheel-blank as it reduces in circumference under the forging action of the hammer, thereby insuring the proper centering of the wheel-blank during the entire operation, and the said pocket or notch 14 is provided with an outwardly and downwardly inclined sloping apex 15ª, which forms a dirt-deflecting groove to carry out dirt, scales, and the like from the pocket or notch, thereby making the said pocket or notch self-cleaning, so that foreign matter cannot accumulate therein.

At the inner edges of the opposite inclined sides of the pocket or notch 14 the side offset portion 13 of the anvil-die is provided with the inclined recesses 15, that removably receive the renewable die-plates 16. The renewable die-plates 16 are inserted edgewise in the recesses 15, and, like the die-block 8, are made of forged steel, in order to be able to stand the wear and strain placed thereon, which wear and strain is ordinarily sufficient to quickly destroy the usefulness of anvil-dies, all of the parts of which are of cast metal. The renewable die-plates 16 are located at points where a great wearing action occurs, and the outer edges of said plates are provided with longitudinal flange-grooves 17, which, in connection with the groove 9 of the die-projection 5, receive the upset metal that is forged into the usual flange of the wheel, while the flat opposite sides of the pocket or notch 14 and the flat face 6 provide for forging the tread on the wheel-blank, as will be readily understood.

In connection with the grooves 17, it will be understood that these grooves not only serve to provide for forming the flange on the wheel-blank, but after the flange has commenced to be formed it will be observed that the said grooves also assist in retaining the wheel-blank in the pocket or notch 14 to prevent the same from flying out of position when struck by the hammer-die.

In connection with the renewable forged-steel die-plates 16, it is to be noted that by reason of the great pressure placed on the wheel-blank the flange-grooves tend to enlarge very rapidly and thereby render the die-plates useless in a short time, but when any deepening of the grooves occurs in the die-plates the latter can readily be removed and replaced without changing or altering the anvil-die casting in any particular, and the provision of said die-plates is therefore very important in providing means for preserving the usefulness of the anvil-die for an indefinite length of time.

The V-shaped pocket or notch 14 is open at its outer side, but is closed at its inner side by the inclined side wall 12 of the anvil-die, which inclined side of the anvil-die forms a a lateral support for the wheel-blank B and serves to hold the same in a proper position for forging the flange and tread thereon.

In further explanation of the function of the inclined wall 12 as a lateral support for the wheel-blank B, it is to be observed that the inclination of such wall is at such an angle as to provide for holding the wheel-blank in such a position that the flat horizontal die-face 6 of the hammer-die projection will form the tread of the wheel with the proper finished taper or bevel, this usually being accomplished by an additional finishing operation after the forging of the wheel-blank. It will also be noted that the inclined wall 12 is important to hold the wheel-blank slightly tilted at one side of a vertical plane, in order that such wheel-blank will naturally rest within the V-shaped pocket or notch 14 without the necessity of being held therein by means of a bar or rod in the hands of an operator, as has heretofore been necessary in using forging-machines similar to the machine covered by this application.

By reason of the specific shape of the pocket or notch 14 the center of the wheel-blank is constantly maintained in a line with the center of the hammer that operates thereon, and thereby obviates any straining or jarring of the machine and insures a uniform forging of the blank, which uniform forging of the blank is caused by the latter having a bearing contact within the pocket or notch at opposite sides of the center of the blank, besides a bearing contact with the hammer-die projection in a line with the center of the blank. This distribution of the strain of hammering on the wheel-blank prevents the same from cracking, splitting, or having other defects.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described machine will be readily apparent to those skilled in the art, and it will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

In a machine for forging and finishing car-wheels, the combination with a hammer-die having a die projection provided with a flat horizontal die-face, of an anvil-die provided with a horizontal flat top face, an inclined side, and an integral offset portion arranged below the plane of the horizontal top face and having a V-shaped supporting pocket or notch therein which is open at its outer side and closed at its inner side by said inclined side of the body of the anvil-die, which inclined side of the anvil-die forms a lateral support or rest for the wheel-blank to allow the same to naturally maintain a slightly-inclined position which prevents the blank from being readily displaced and also disposes the same at the proper inclination for forming the tread with the proper finished taper or

bevel, said offset portion of the anvil-die being provided at the inner edges of the inclined sides of the pocket or notch with flange-forming grooves which also assist to retain the blank properly in position, substantially as set forth.

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

JAMES A. FACER.

Witnesses:
CHARLES H. WEISS,
WM. H. EMHARDT, Jr.