

E. WHEELER.  
MACHINE FOR FORGING METALS.

2 SHEETS—SHEET 1.

Fig. 2.

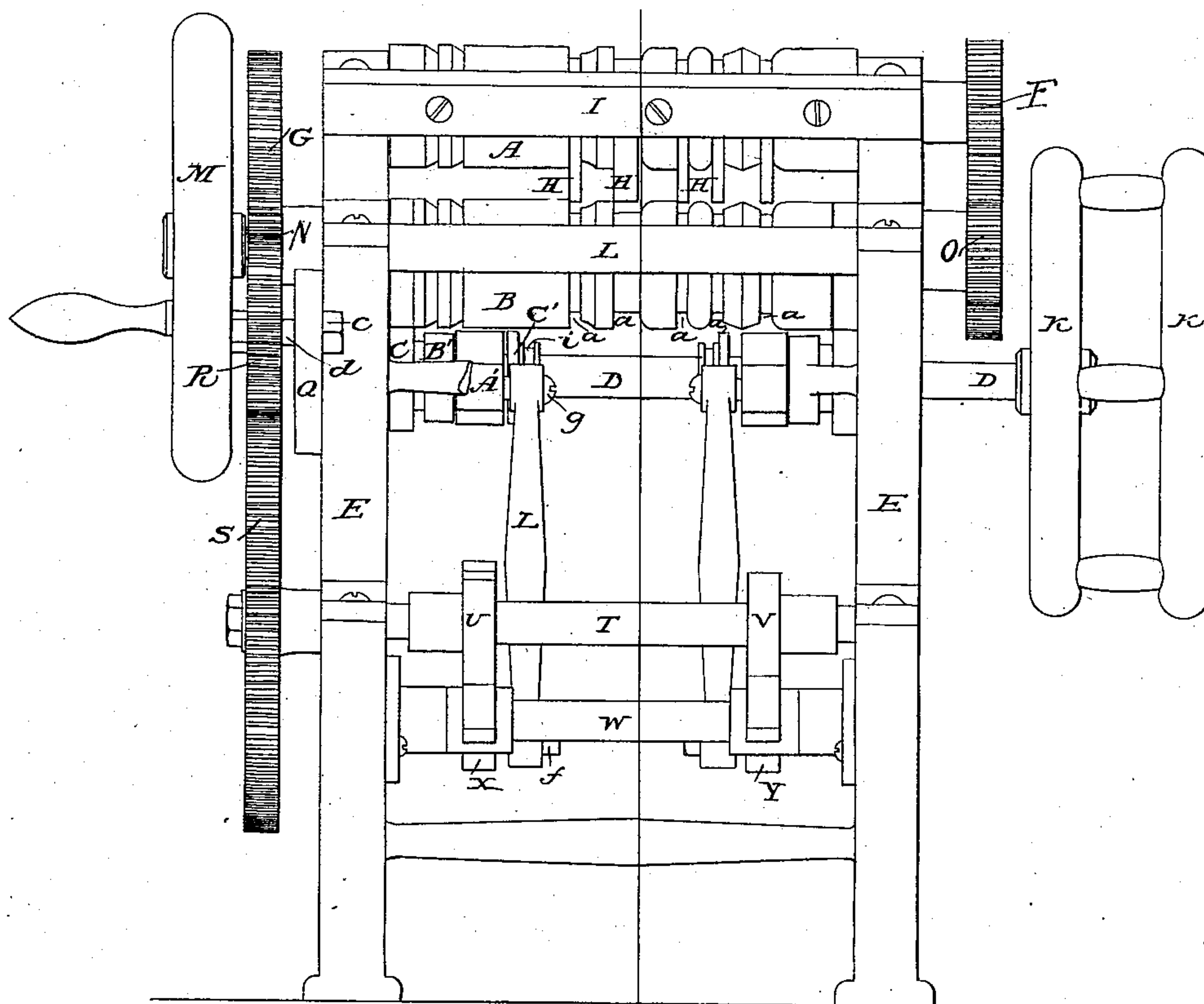
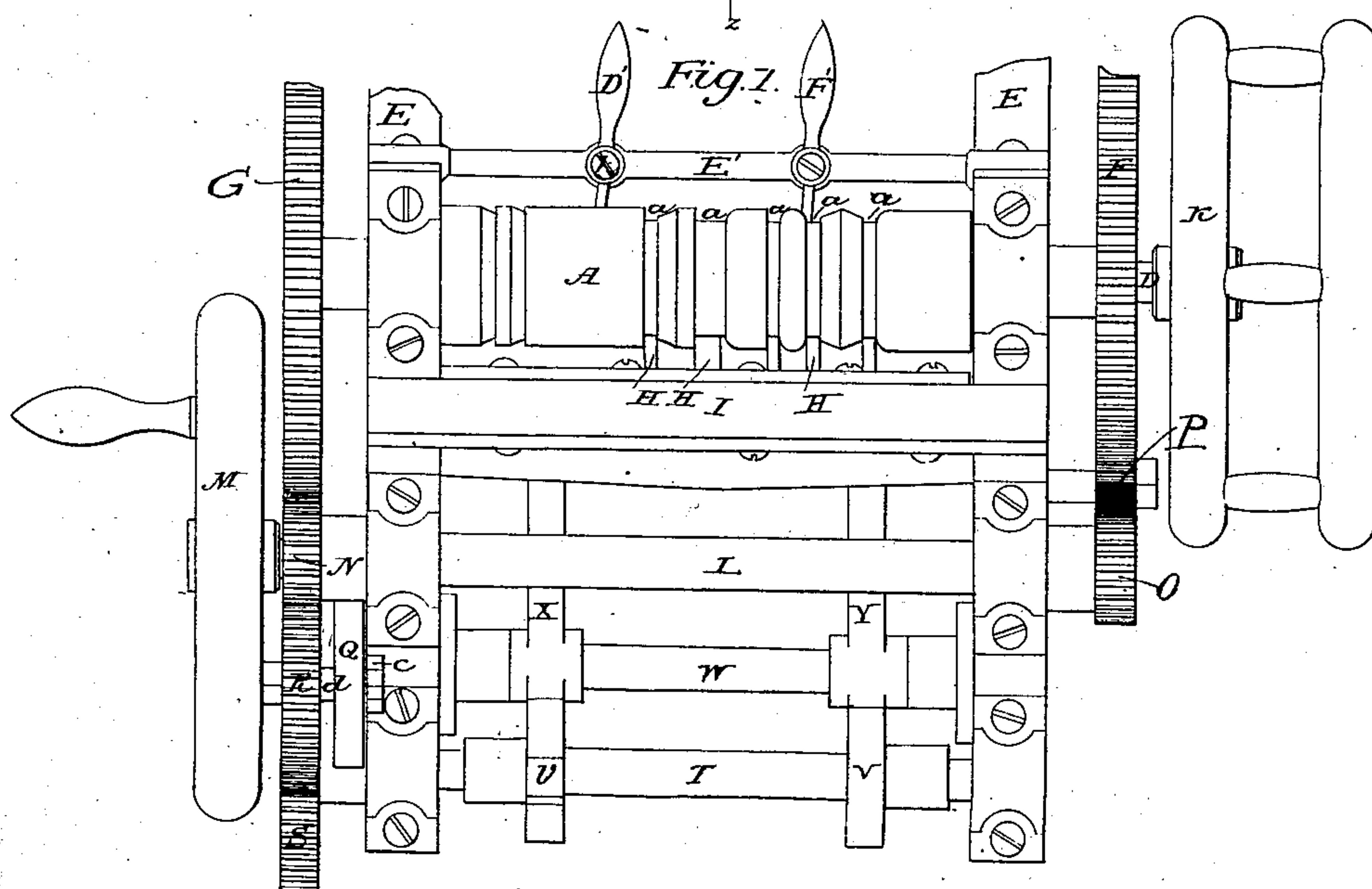


Fig. 1.





*E. Wheeler.*

*Mach. for Forging Metal.*

*N<sup>o</sup> 1815.*

*Patented Sept. 1. 1857*

*2.Sheets - Sheet 2.*

Fig. 3.

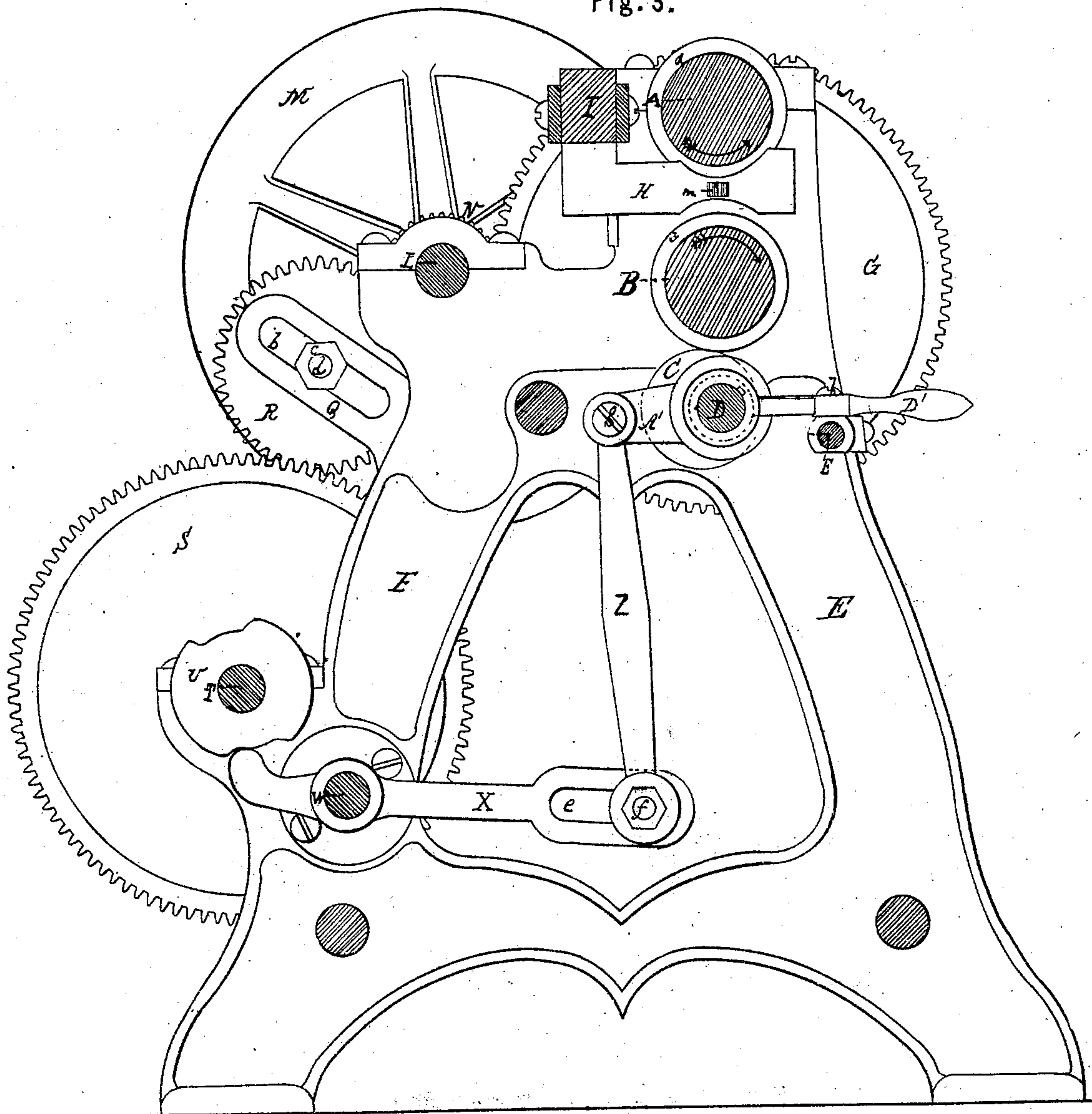


Fig. 4.

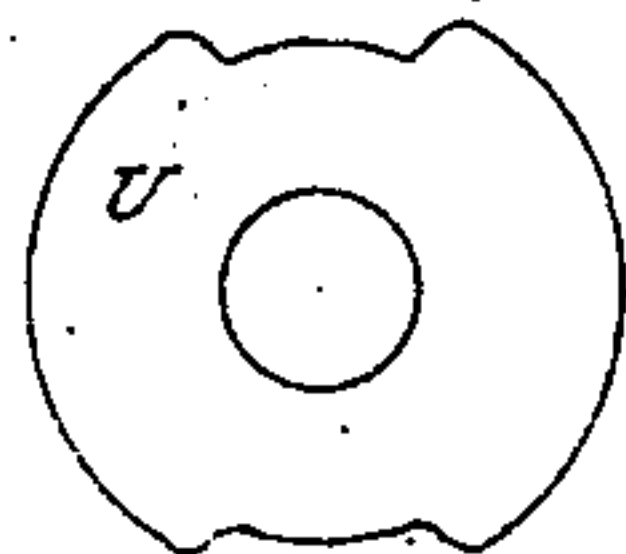
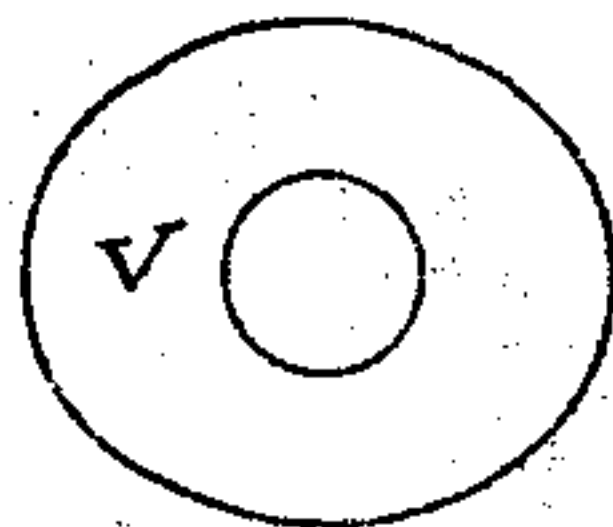


Fig. 5.





# UNITED STATES PATENT OFFICE.

ELBRIDGE WHEELER, OF FELTONVILLE, MASSACHUSETTS.

## MACHINE FOR FORGING METALS.

Specification of Letters Patent No. 18,115, dated September 1, 1857.

*To all whom it may concern:*

Be it known that I, ELBRIDGE WHEELER, of Feltonville, in the county of Middlesex and State of Massachusetts, have invented  
5 certain Improvements in Machines for Forging Metals, which improvements are applicable to the machines for which I obtained Letters Patent of the United States, dated January 27, 1857; and I hereby declare the  
10 following to be a full, clear, and exact description of my present improvements, reference being had to the accompanying drawings, making part of this specification, in which—

15 Figure 1 is a plan of a forging machine with my improvements attached. Fig. 2 is a rear elevation of the same. Fig. 3 is a transverse vertical section on the line  $x-x$  of Fig. 2. Figs. 4, 5 details to be referred to here-  
20 after.

In the machine described in the above mentioned Letters Patent, the forging of the metal is accomplished by the rollers A and B of these drawings which are revolved with  
25 an equal surface motion in the direction of the arrows by suitable gearing, the boxes or bearings of the lower shaft B sliding up and down in suitable ways or grooves in the frame of the machine; allowing the roll B  
30 to approach and recede from the roll A while in operation. This movement of the roll B was effected by cams C on a shaft D, having fixed bearings in the frame (one of these cams being placed near each end of the  
35 shaft D,) a hand lever attached to the shaft D toward the front side of the machine, placed the operation of the rolls entirely under the control of the operator, who stood at the front of the machine and passed the  
40 heated iron in between the rolls and by applying the proper amount of pressure by means of the hand lever, the metal was forged and rolled out toward him, when he again separated the rolls and repeated the  
45 operation. Thus by means of certain grooves in the rolls and certain stationary guards hung between the rolls and fitting into grooves in the rolls he was enabled to forge any desired form. The machine was  
50 particularly suitable for forging the planks for horse shoes to be afterward bent into form. Now where such a form is to be given to the bar of iron being rolled, that it

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is an arm Q, having a slot *b* in which is secured by a nut *c*, a short shaft *d*, which carries an intermediate gear R, which engages with a larger wheel S, on the end of a shaft T, having its bearings in the frame E. The shaft *d*, of the gear R, is made adjustable in the slot *b*, that the wheel S, may be replaced with one of a different size as the speed of the shaft T, may be required to be changed.

The shaft T, carries two cams V, (detached in Fig. 4) and V, (detached in Fig. 5) these cams are of the proper contour and size to cause the roll B to be raised at the proper time and to be held up sufficiently long to give the required undulations to the bar being rolled; which is effected in a manner which will be presently explained. These cams on the shaft T, may be replaced by others of a different size and shape or the speed of the shaft may be varied as before stated, either or both of which will give a different form to the article rolled. Hung in bearings in the frame E, is another shaft W, which carries and serves as a fulcrum for two levers X, and Y, the shorter arms of which bear one against each of the cams U, and V, the lever X, being vibrated by the cam U, and the lever Y, by the cam V, as these levers and their connections with the shaft D, are similar, I will describe one of them X, (see Fig. 3). The longer arm of this lever has near its outer end a slot *e*, through which passes a bolt *f*, secured by a nut, which bolt also passes through the lower end of a pitman Z. The pitman vibrates on the bolt *f*, which is secured in place by its nut after being adjusted in the slot *e*, this adjustment of the bolt *f*, in the slot *e*, varies the height to which the pitman Z is raised at each vibration of the lever X. Pivoted to the head of the pitman Z, at *g*, is a short arm A', the other end of which embraces the shaft D, the shaft turning freely in it. Secured to the shaft D, alongside of the arm A', and between it and the side of the frame is a collar B' and on the other side of the arm A' is a clutch C' embracing the shaft D. This clutch is moved longitudinally on the shaft by a hand lever D' pivoted at *h*, on a bar E' extending from one side of the frame E, to the other and secured thereto—the inner end of this hand lever rests in a groove *i*, in the clutch. A square pin attached to the face of the clutch C', passes through the arm A' where it embraces the shaft D, and enters a hole in the collar B'. By this means as the lever D' is moved horizontally in one direction, the arm A', is clutched with the shaft D, and as the short arm of the lever X, is depressed by the cam U, the pitman Z, will be raised and the shaft D, be revolved a portion of a turn the cams C, on it raising the roll B—as the lever D', is moved in the opposite direction the arm A' is unclutched from the shaft and the

pitman may rise and fall without operating the cams C. Another hand lever F' serves to connect by a similar clutch and collar the shaft D, to the arm and pitman connected with the lever Y, and thus cause the rise and fall of the shaft B, to be governed by the cam V.

By the above arrangement, almost any desired form may be given to a bar of iron to accord with a given pattern.

The machine represented in the drawings is arranged with two cams on the shaft T, and a double set of levers and clutches, so that a bar may be rolled through and receive one form or set of undulations, and then without changing the parts of the machine but only throwing out one clutch and connecting the other, the bar may be run through on its other side forming a second set of impressions of undulations at right angles to the first, the cams here represented are suitable for forming a bar of iron to a required pattern, having certain undulations in its surfaces at regular intervals, leaving the bar thicker in some parts than in others, and wider in some places than in others. These bars when thus rolled are intended to be cut into blanks to be bent into horse shoes.

The roll B, is only operated by the cams on the shaft T, when it is intended to roll long bars into a given form as above described; or it may be used as described in the above mentioned Letters Patent for forging shorter pieces; the operator standing in front of the machine, unclutches the parts operated by the cams U, and V, and regulates the vertical movement of the roll B by means of the hand wheel K, attached to the shaft D. These combinations enable me to obtain an almost unlimited variety of forms. First by changing the cams on the shaft T, second by changing the speed of this shaft, by replacing the wheel S, with one of a different size, third by changing the position of the bolt *f*, in the slot *e* of the lever X; which varies the throw of the pitman Z.

The second part of my present invention consists in certain improvements in the stationary guards which hang between the rolls A, and B. These guards, one of which is seen at H, Fig. 3, are hung to a rigid bar I, extending across and secured to the frame of the machine, they hang between the rolls A and B and are received in the grooves *a*, in the rolls, their object is to keep the edge of the piece of metal being forged or rolled, straight and smooth (as is more fully set forth in the said Letters Patent) now as the metal presses against the face of the guard against which it may happen to be, while it is drawn through between the rolls, there will be a considerable amount of friction between the metal and the guard; to obviate this I have inserted in the guard a fric-



tion roll *m*, (Fig. 3) which is carried on a shaft or rod passing vertically through the guard in a plane parallel to its face.

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

Operating the roll B at stated intervals by means of the above described arrangement of cams and levers or their equivalent;

whereby I am enabled to roll a piece or bar of metal to a given pattern in the manner 10 substantially as herein set forth.

ELBRIDGE WHEELER.

Witnesses:

J. E. MAGRUDER,  
THOS. R. ROACH.