March 29, 1938. J. MacLENNAN 2,112,653

METHOD OF FORMING BRAKE DRUMS

Filed March 26, 1934

FIG. 1.

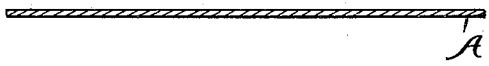


FIG. 2.

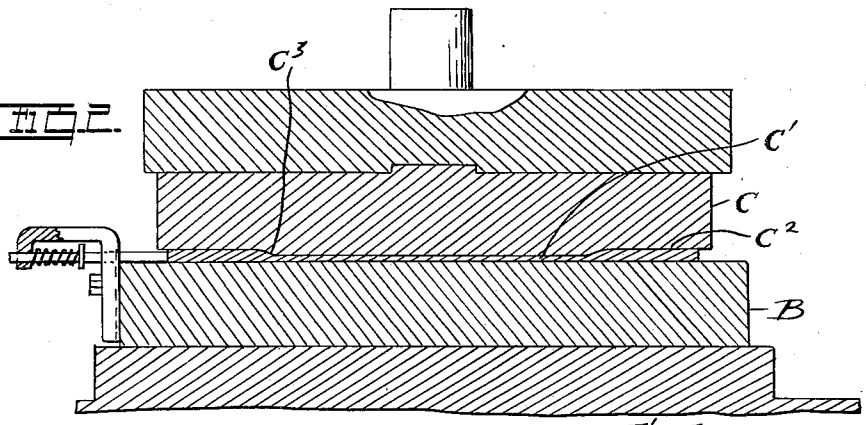


FIG. 3.

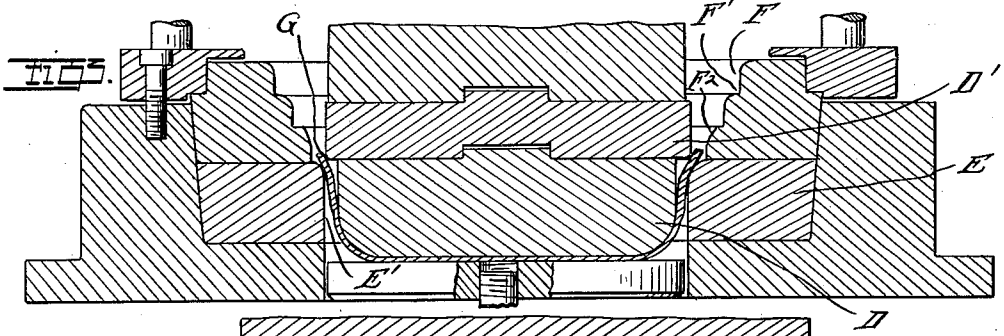
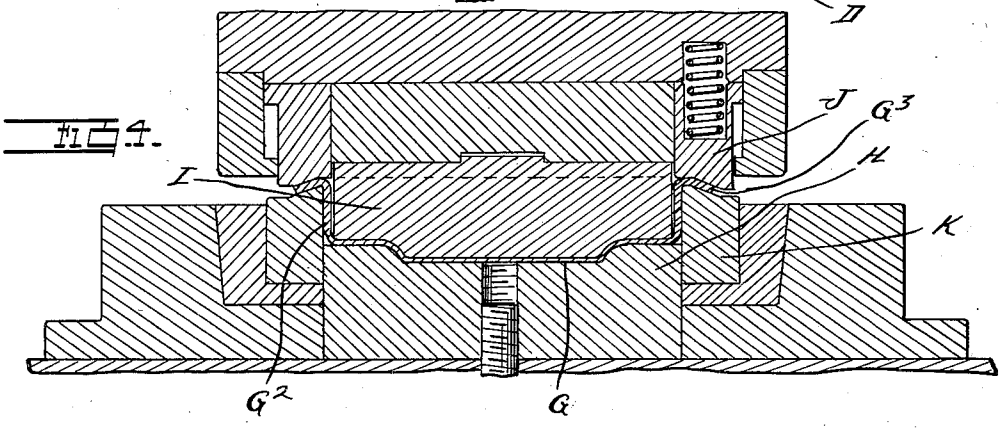


FIG. 4.



INVENTOR

John MacLennan

BY Whittemore Hulbert & Whittemore & Belknap

ATTORNEYS

Patented Mar. 29, 1938 2,112,653

UNITED STATES PATENT OFFICE

2,112,653

METHOD OF FORMING BRAKE DRUMS

John MacLennan, Detroit, Mich., assignor to Kelsey-Hayes Wheel Company, Detroit, Mich., a corporation of Delaware

Application March 26, 1934, Serial No. 717,497

1 Claim. (Cl. 29—152.2)

The invention relates to the manufacture of brake drums from sheet metal of uniform gauge and it is the object of the invention to obtain a product in which the braking flange is of greater thickness than the web portion of the drum. To this end the invention consists in the method as hereinafter set forth.

In the drawing:

Fig. 1 is a side elevation of the uniform gauge sheet metal blank from which the drum is to be formed;

Fig. 2 illustrates the first operation of reducing the thickness of the center portion of the blank relative to the thickness of the peripheral portion thereof;

Fig. 3 illustrates the bowling of the blank and

Fig. 4 the final operation of refashioning the bowled blank and forming the outwardly extending flange thereon.

The first step of my improved process is to cut a circular blank A from sheet metal of uniform gauge and of sufficient thickness to form the cylindrical brake flange. The mass of this blank corresponds to that of the finished product, but its diameter is initially less than that required for forming the bowled blank. This blank A is then heated and subjected to a pressing operation between die members B and C. The die member C has its central portion C′ projecting beyond the peripheral portion C^2 and intermediate these two portions is the tapering portion C^3. Thus when pressure is applied, the central portion of the blank A will be squeezed to reduce its thickness and to flow the metal radially outward into the space between the die B and the portion C^2 of the die C. This will increase the diameter of the blank and may also effect an upsetting operation which will increase the thickness of the peripheral portion.

After removal from the dies B and C, the blank is reheated and subjected to a bowling operation, being pressed by a plunger D into a female die E. The die E has the flaring mouth portion F in which the flat blank is first coned before entering the cylindrical portion E′ and this conical portion is preferably provided with annular grooves F′ cut therein, leaving intermediate portions F^2 of reduced area for fashioning the blank and thereby limiting the heat losses. The space between the parallel cylindrical surfaces of the die D and cylindrical portion E′ of the die E is greater than the thickness of the metal in the peripheral portion of the blank so that during bowling a slight clearance will be left between the blank and the plunger D to facilitate the easy withdrawal of the latter. The plunger D is provided with an enlarged portion D′ which in conjunction with the die E forms an outwardly obliquely flaring flange as indicated at G. This is subsequently refashioned to form a reinforcing flange for the drum.

The next step in the operation is the refashioning of the bowled blank by pressing it between dies H and I which suitably fashion the web portion. There are also annular dies J and K between which the oblique flange G is refashioned into the form indicated.

The drum constructed by the method above described has its web portion G′ of a thin cross section in comparison with the cross section of the cylindrical flange G^2 and the outwardly extending reinforcing flange G^3. This increases the strength and diminishes the weight of the finished product.

What I claim as my invention is:

In a method of forming blanks for brake drums, the step of hot-pressing a circular sheet metal blank of uniform gauge between dies having parallel faces, the face of one of said dies being in a plane and the other die having a circular central portion less than the diameter of the blank in one plane, and a surrounding annular portion in an outwardly offset plane and squeezing the metal of the blank in the central portion thereof outwardly and thereby thinning this portion and increasing the diameter of the surrounding portion and the thickness thereof within the limits imposed by the opposite faces of said dies,

JOHN MacLENNAN.