Feb. 10, 1925. 1,525,908

J. F. BEANS

DIE

Filed Oct. 14, 1921 2 Sheets-Sheet 1

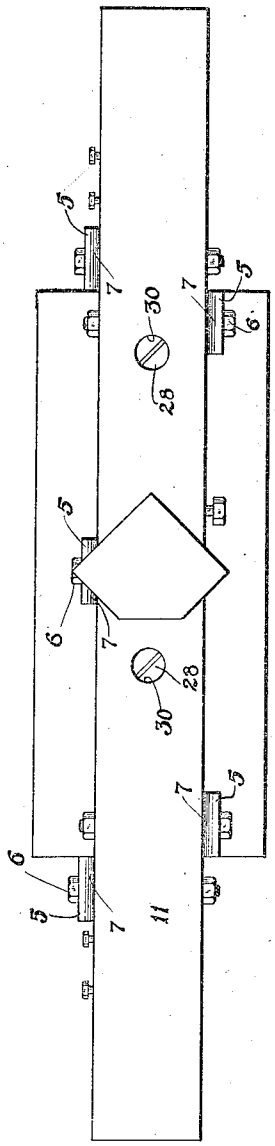


Fig. 1

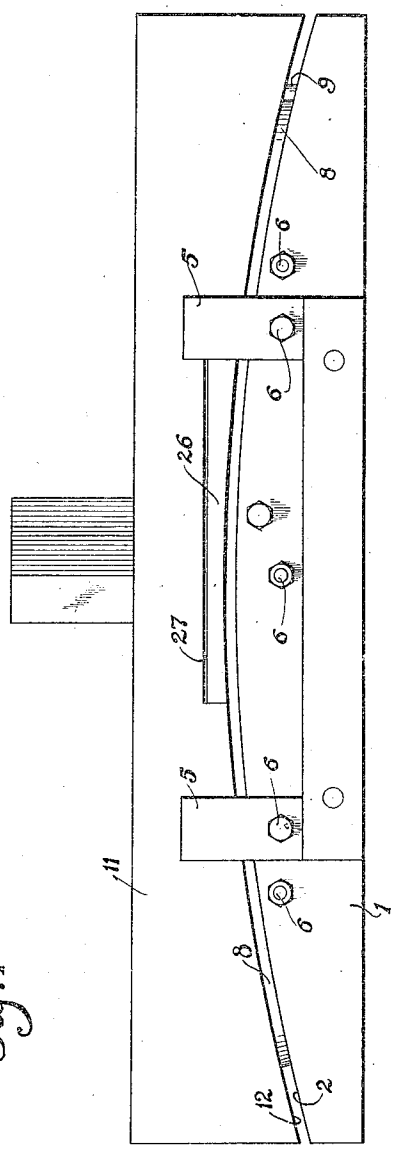


Fig. 2



Fig. 7

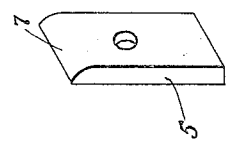


Fig. 6

Inventor

John F. Beans

Grease and Bond

Attorneys

Feb. 10, 1925. 1,525,908

J. F. BEANS

DIE

Filed Oct. 14, 1921 2 Sheets-Sheet 2

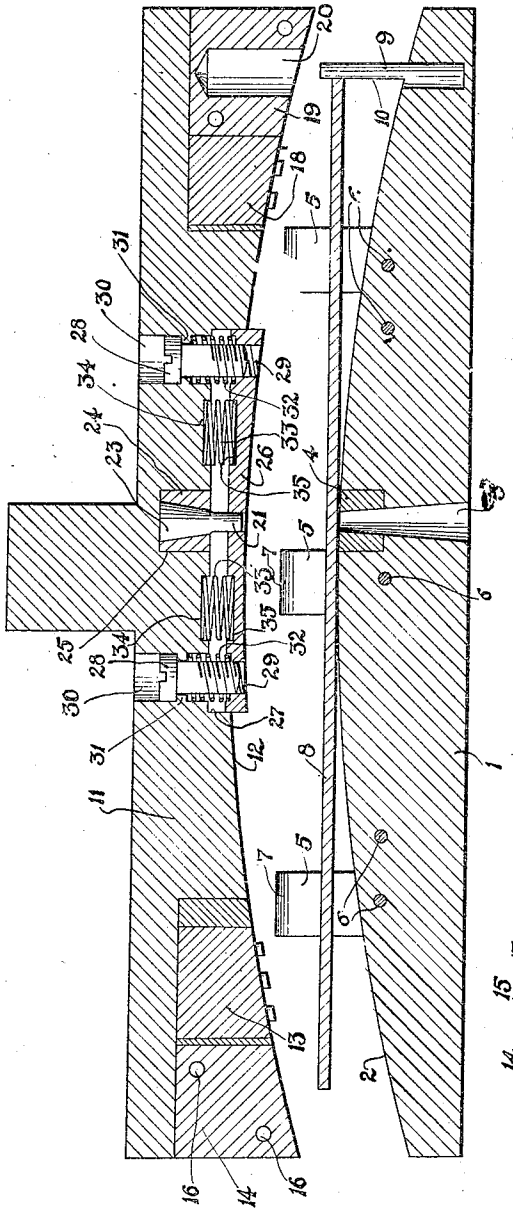


Fig. 3

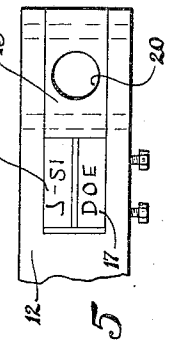


Fig. 5

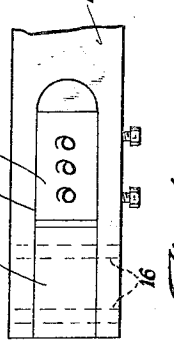


Fig. 4

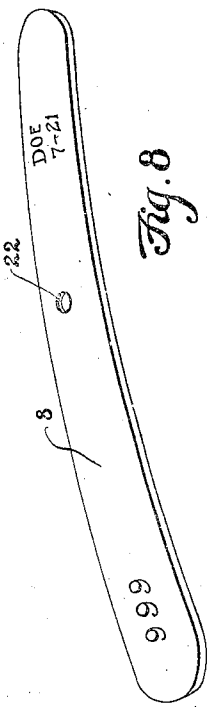


Fig. 8

Inventor

John F. Beans

Greaves and Boud

Attorneys

Patented Feb. 10, 1925. 1,525,908

UNITED STATES PATENT OFFICE.

JOHN F. BEANS, OF CANTON, OHIO, ASSIGNOR TO THE BEANS SPRING COMPANY, OF MASSILLON, OHIO, A CORPORATION OF OHIO.

DIE.

Application filed October 14, 1921. Serial No. 507,673.

To all whom it may concern:

Be it known that I, JOHN F. BEANS, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Die, of which the following is a specification.

This invention relates to improvements in dies and more particularly to dies for forming, punching and stamping leaves for vehicle springs.

The objects of the invention are to provide a die of this character arranged to receive a heated blank or strip provided with means for positioning the same properly within the die and arranged to bend the blank or strip to the proper curvature and stamp the same with any marking such as the name of the manufacturer, the date of manufacture and number of the part and at the same time to punch the leaf, means being provided for stripping the formed leaf from the punch, when the die is opened.

With these objects in view, the invention consists in the construction and arrangement of parts, hereinafter described and illustrated in the accompanying drawings, it being understood that various changes in the form and details of construction may be made within the scope of the appended claim.

A preferred embodiment of the invention is disclosed in the accompanying drawings, in which—

Figure 1 is a plan view of a die embodying the invention;

Fig. 2, a side elevation of the same in the closed position;

Fig. 3, a longitudinal section through the die in the opened position, showing a blank therein;

Fig. 4, an inverted plan view of the one end of the upper die;

Fig. 5, a similar view of the other end;

Fig. 6, a detail perspective view of one of the side guides;

Fig. 7, a similar view of the stop for positioning the blank within the die; and

Fig. 8, a perspective view of the finished leaf formed in the die.

Similar numerals of reference indicate corresponding parts throughout the drawings.

The device includes the stationary die 1 arranged to be fixedly mounted upon the base or anvil of any suitable form of press. The upper surface 2 of this die is curved to conform to the curvature of the spring leaf which the die is adapted to form and is provided midway of its ends with downwardly flared apertures 3, a removable bushing 4 being preferably provided at the upper end of this aperture. This bushing is made removable in order that different sizes of apertures may be punched in the leaf by changing the size of the bushing, and further to provide for replacing the bushing when the same becomes worn.

Guides 5 are located at intervals and in staggered relation upon each side of the die, these guides being connected to the die 1 as by the bolts 6 and extending upwardly above the die 1, being provided with the outwardly tapered upper extremities 7 for the purpose of guiding the blank 8 laterally upon the die 1.

The positioning stop 9 is provided near one end of the die 1 and has the upwardly extending portion provided with the flat face 10, extending above the curved surface 2 of said die and arranged to be engaged by the adjacent end of the blank 8 as the same is placed upon the die, in order to properly position the blank upon the lower die.

The upper die 11 is arranged to be carried in the movable presser head of the press and is provided with the lower curved surface 12 conforming with the curvature of the upper face 2 of the lower die. For the purpose of marking or stamping upon the finished spring leaf the factory number of the part, a stamping die 13 is located near one end of the upper die 11 and is preferably held in place by the block 14 which is located in the recess 15 formed in the lower face of the die 11, pins 16 being passed therethrough.

Similar dies 17 and 18 are located in the other end portion of the die 11 for the purpose of stamping the name and date upon each spring leaf, these dies being held in place by means of the block 19 which is provided with the vertical opening 20 arranged to receive the positioning stop 9.

The punch 21 which punches the aperture 22 in the leaf is provided with the upwardly flared, conical portion 23 mounted in the bushing 24 which is received in a suitable socket 25 formed in the upper die.

For the purpose of stripping the finished

leaf from the punch when the dies are open, a stripping plate 26 is provided upon the punch, a cut-out portion 27 being provided in the lower surface of the die 11 to receive said stripping plate when the dies are closed, as shown in Fig. 2.

The stripping plate is attached to the upper die by means of the headed screws 28, the lower ends of which engage the threaded apertures 29 in the stripping plate, said screws being slidably located within the channels 30 formed in the upper die, an annular shoulder 31 being provided midway in each of said channels, a coil spring 32 being located around each screw and interposed between said shoulder and the upper surfaces of the stripping plate normally holding the same in the position shown in Fig. 3.

For the purpose of adding additional tension to the stripping plate, the springs 33 may be provided, being located in the opposed sockets 34 and 35 in the die 11 and stripping plate respectively.

The operation of the device is as follows: The upper die 11 being in the raised position which is ordinarily spaced a greater distance above the die 1 than is shown in Fig. 3, a heated blank 8 is placed upon the die 1 between the guides 5, one end thereof engaging the stop 9.

The upper die 11 is then moved downwardly in the usual manner, into the position shown in Fig. 2, curving the blank into the form shown in Fig. 2, the stamping dies 13, 17 and 18 stamping the number, name and date upon the leaf.

At the same time, the punch 21 will pass through the leaf and into the aperture in the bushing 4, punching the aperture 22 in the leaf. It will be understood that the stripping plate 26 will engage the blank before the punch 21, holding this portion of the blank against movement until the same has been formed and punched.

It will, of course, be seen that the springs 32 and 33 will be compressed as the upper die moves downwardly, the stripping plate moving into the recess 27 in the upper die. As the upper die is raised, the springs 32 and 33 will force the stripping plate down into the position shown in Fig. 3, shoving the finished leaf off of the punch when the leaf may be removed by the operator and placed in a quenching tank.

The tension upon the springs 32 and 33 may be varied by tightening or loosening the screws 28, thus holding the stripping plate normally at any desired distance from the upper die. This adjustment may be accomplished by inserting a screw driver into the upper end of the passage 30 and engaging the head of the screw 28.

It will be evident from the above and an inspection of the accompanying drawings, that a die is provided which in a single operation forms, stamps and punches a finished spring leaf from a blank and automatically strips the finished leaf from the punch as the die is opened.

Although the drawings and above specification disclose the best mode in which I have contemplated embodying my invention, I desire not to be limited to the details of such disclosure, for, in the further practical application of my invention, many changes in form and construction may be made, as circumstances require or experience suggests, without departing from the spirit of the invention, within the scope of the appended claim.

I claim:—

A device of the character described including a fixed lower die having a downwardly flared opening therein and provided with a curved upper surface, a positioning stop near one end of the lower die, a plurality of upwardly disposed guides upon each side edge of said lower die, a movable upper die provided with a lower surface conforming with the upper surface of the lower die and having an opening to receive said positioning stop, a punch in the upper die arranged to be received in said flared opening when the upper die is lowered, and a spring pressed stripper plate upon the upper die conforming to the contour of the lower die and provided with an opening to receive the punch, said stripper plate being arranged to engage a blank simultaneously with the punch and to remove the finished product from the punch when the upper die is raised.

In testimony that I claim the above, I have hereunto subscribed my name.

JOHN F. BEANS.