(No Model.)

O. F. FREEMAN.

METHOD OF AND APPARATUS FOR MAKING LEAF SPRINGS.

No. 488,553. Patented Dec. 27, 1892.

Fig. 1.

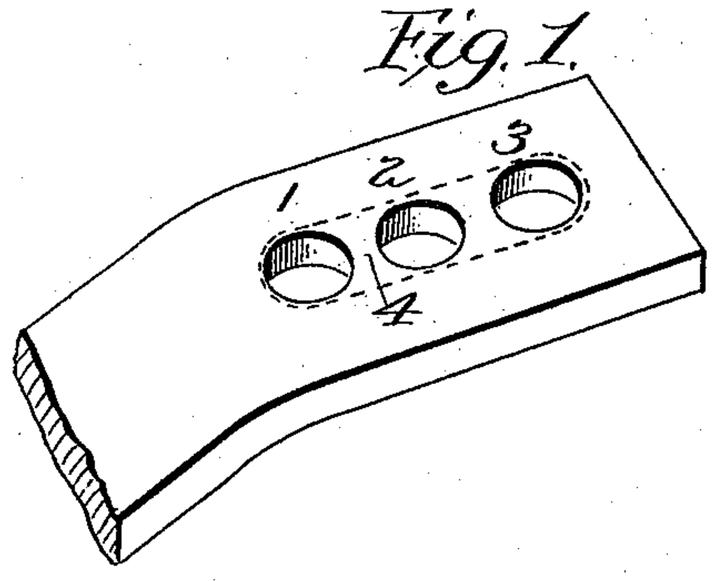


Fig. 2.

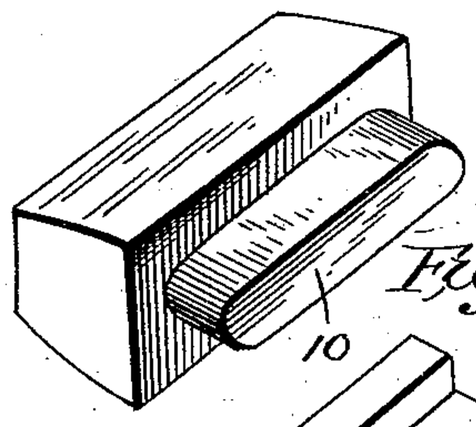
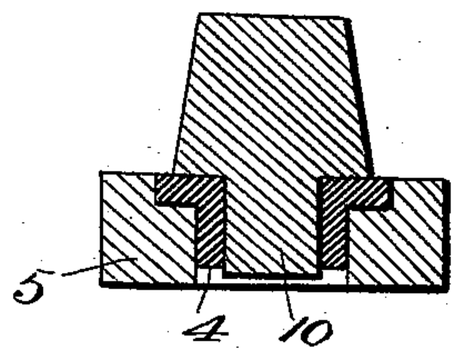


Fig. 3.



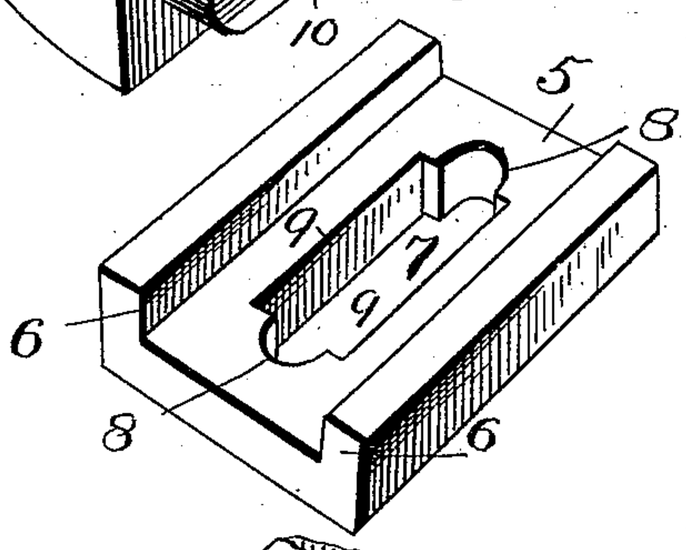
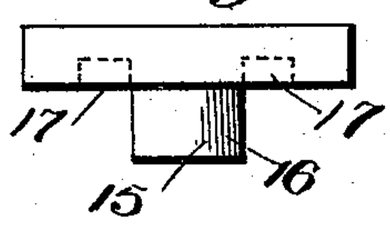


Fig. 4a.



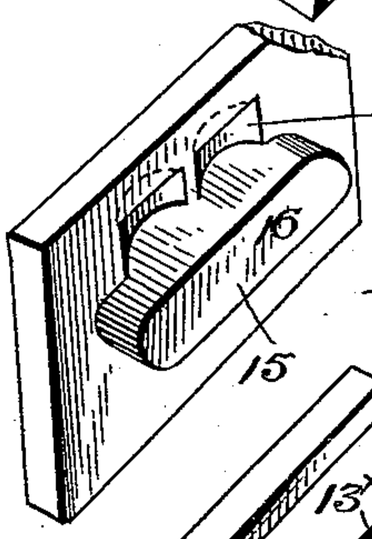


Fig. 4.

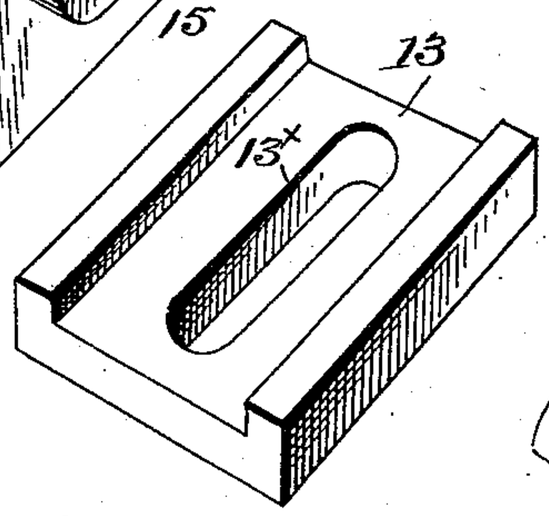


Fig. 3a

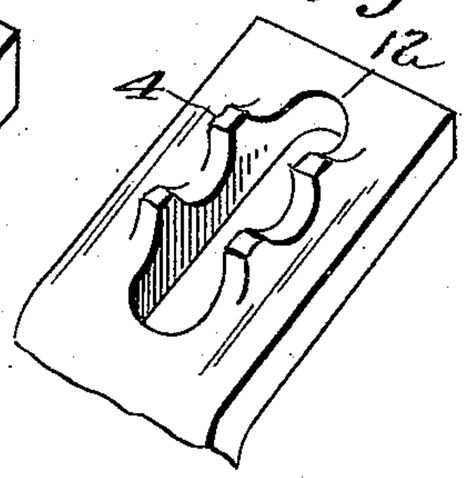
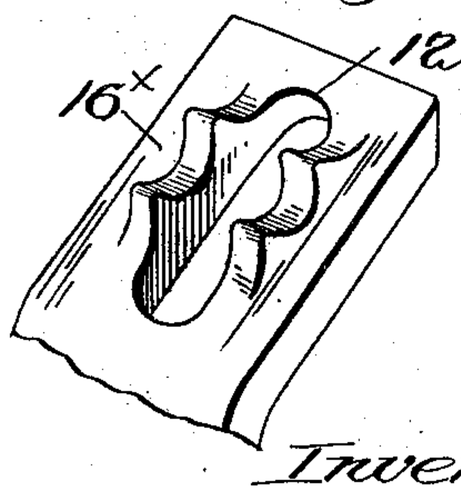


Fig. 5.



Attest

Walter Donaldson

F. L. Middleton

Inventor

O. F. Freeman.

by Ellis & Spear

Atty.

UNITED STATES PATENT OFFICE.

OSCAR F. FREEMAN, OF DRIFTON, PENNSYLVANIA.

METHOD OF AND APPARATUS FOR MAKING LEAF-SPRINGS.

SPECIFICATION forming part of Letters Patent No. 488,553, dated December 27, 1892.

Application filed April 11, 1892. Serial No. 428,683. (No model.)

To all whom it may concern:

Be it known that I, OSCAR F. FREEMAN, a citizen of the United States of America, residing at Drifton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Leaf-Springs and the Method of and Apparatus for Making the Same, of which the following is a specification.

My invention is designed particularly for the manufacture of the upper leaves of locomotive springs which as is well known are provided with bearings for receiving and holding the upper ends of the hangers.

The invention consists in the method of forming said bearings and the means for carrying out the several steps of the process.

In the accompanying drawings: Figure 1 is a perspective view of the bearing end of the spring leaf after being subjected to the first operation. Fig. 2 is a perspective view of the upper and lower dies for carrying out the next step in the process. Fig. 3 is a transverse section of the same with the spring leaf in place. Fig. 3ª is a view of the blank as it leaves the dies. Fig. 4 is a perspective of the next set of dies used for producing the finished article, the upper die being tilted back. Fig. 4ª is a detail view of the upper die. Fig. 5 is a view of the article produced.

In carrying out my invention the leaf at its end is punched with three holes 1, 2, 3, the centers of which are in line with each other and with the longitudinal axis of the leaf. The holes are a sufficient distance apart to leave portions 4 of metal intact between the openings. After being punched with these holes the perforated end of the leaf is laid on a suitable anvil and with a chisel the workman severs the portions 4 on a line with the centers of the openings and then the leaf is laid in the die 5 which is provided with the confining shoulders 6, to bear upon the edges of the leaf and hold it accurately. The die is provided further with an opening 7 having rounded ends 8 and lateral extensions 9 which when pressure is applied to the punched portion of the leaf by the upper die 10 receives the tongues or portion 4 which being separated centrally and turned down one half remains connected to each side of the opening. The die 10 is formed with rounded corners and flat sides and is of a size and shape corresponding to the general configuration of the punched out portion of the leaf or that portion inclosed within the dotted line of Fig. 1.

The main opening 7 in the die (that is, the portion exclusive of the extensions 9) is accurately formed to receive the male die 10 and it will thus be seen that when these dies operate upon the blank they form the elongated opening 12, Fig. 5, and upset the tongues 4 at one operation the opening being formed accurately and complete. The blank is then placed within the female die 13 of another set of dies and this die also has confining shoulders and a central opening $13^{\times}$ the said opening however corresponding in shape to the opening in the blank or in other words being the same as the main opening in die 5 omitting the lateral extensions. The blank is placed with its opening registering with the opening $13^{\times}$ and with the tongues 4 projecting upwardly. The upper die 15 of this pair has a projection 16 to fit the opening in the blank and lower die and on each side of this projection two depressions are formed adjoining each other and properly rounded so that as the die descends the central projection will enter the opening in the blank and confine the metal from spreading inwardly and the upwardly projecting tongues will enter the said depression and be pressed into shape to afford proper bearings for the hanger said bearings being shown in Fig. 5 at 16. The upper die of the first set is narrow enough to allow it to fit within the side shoulders of the female die. The upper die of the second set however is wide enough to reach over said shoulders to rest thereon.

I claim as my invention:—

1. The hereindescribed method of forming bearings on springs consisting in punching a series of openings through the blank, completing the elongated opening by severing the tongues 4 between the openings upsetting the tongues as severed and finally pressing the said tongues upon the face of the blank about the opening to form the bearings substantially as described.

2. The herein described means for forming bearings on springs consisting of the two sets of dies to be used in succession the first set having a female die, having the opening 7

with lateral extensions 9 and an upper die having a projecting portion to fit the opening 7; the second set having a female die with an opening corresponding to the main opening 7 of the first female die omitting the extensions and the second upper die having a projection to fit the opening $13^{\times}$ and the depression on each side of the projection, substantially as described.

3. In combination, the lower die having opening $13^{\times}$ and the upper die having the projection adapted to fit the opening $13^{\times}$ and having a pair of depressions on each side of the projection both depressions of each pair being arranged adjacent to the projection, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

OSCAR F. FREEMAN.

Witnesses:
C. O. STROH,
ADOLF WEISE.