

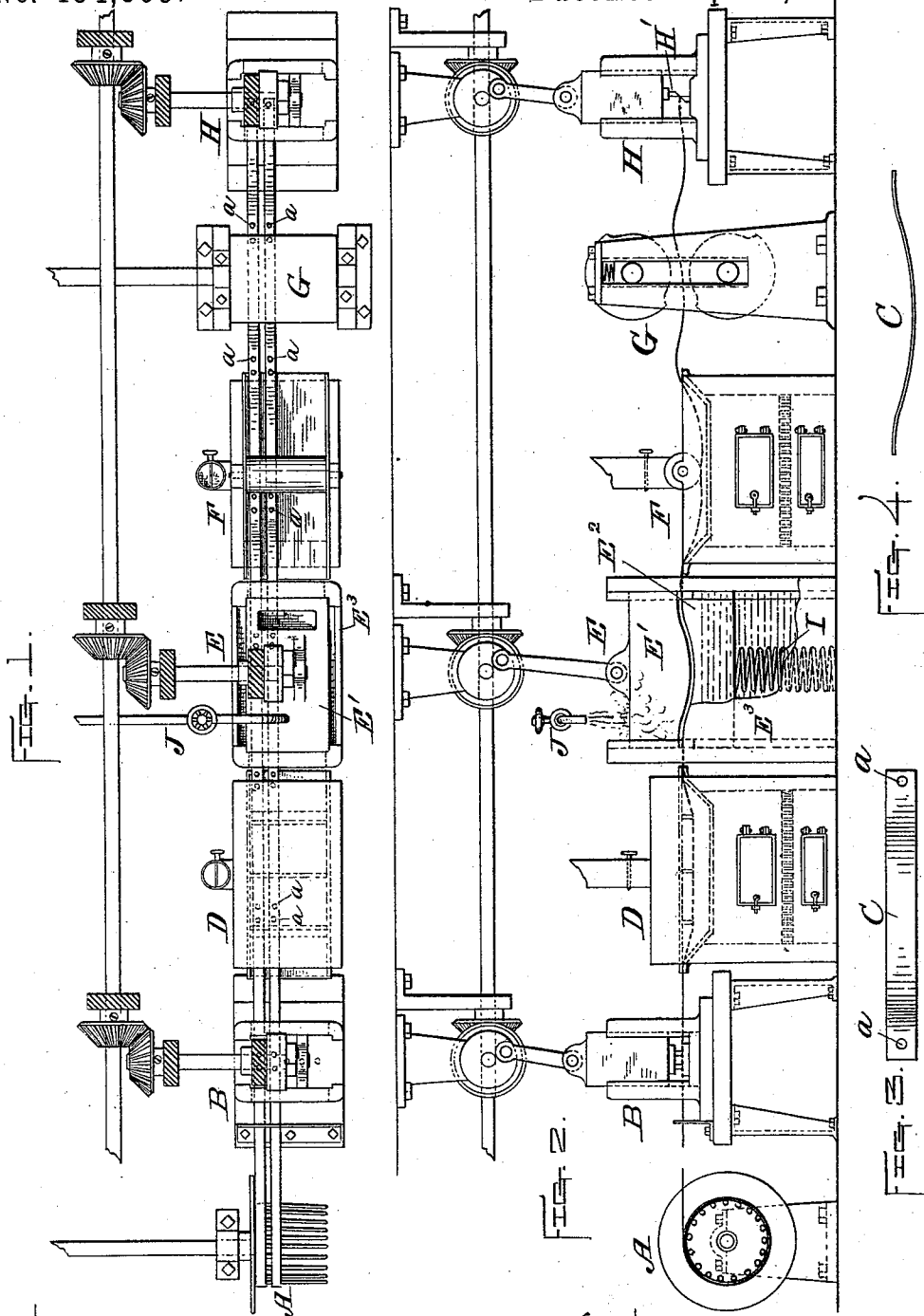
(No Model.)

E. J. WATSON.

## PROCESS OF MAKING METAL SHOE SHANK STIFFENERS.

No. 494,609.

Patented Apr. 4, 1893.



Witnesses;

C. Forrest Kesson.  
Fred E. Buss.

Inventor;

Edwin J. Watson.  
By A. A. Parker. Atty.

# UNITED STATES PATENT OFFICE.

EDWIN J. WATSON, OF WORCESTER, MASSACHUSETTS.

## PROCESS OF MAKING METAL SHOE-SHANK STIFFENERS.

SPECIFICATION forming part of Letters Patent No. 494,609, dated April 4, 1893.

Application filed March 23, 1892. Serial No. 426,071. (No specimens.)

*To all whom it may concern:*

Be it known that I, EDWIN J. WATSON, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in the Art or Process of Making Metal Shoe-Shank Stiffeners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a plan of an apparatus for carrying out my said improved art or process. Fig. 2 is a side view thereof, and Figs. 3 and 4 are a plan and side view respectively, upon an enlarged scale, of a shoe-shank stiffener made in accordance with my invention.

Said invention consists of the improved process of making shoe-shank stiffeners by successively subjecting successive portions of a continuous strip of metal to the following steps, to wit: heating, bending into the form of bows, hardening and reheating, as will be hereinafter more fully set forth.

To enable others skilled in the art to which my invention appertains to better understand the nature and purpose thereof, I will now proceed to describe it more in detail with reference to an apparatus for making shoe-shank stiffeners.

In the drawings, A represents a reel from which the flat wire that the shank-stiffeners are made from is unwound.

B is a punching machine for making the holes  $\alpha$  in the wire for the stiffeners C.

D is a heating furnace.

E is a combined press, and water or oil tank for bending the wire into the shape that the stiffeners are desired to be made, at the same time hardening or setting said bent wire.

F is a tempering furnace; G a pair of feed-rolls for drawing the wire forward from reel A through the apparatus, and H is a cutting machine for severing each completed stiffener from the main strand, as it is intermittently fed forward.

In practice the wire is punched, bent, and the completed stiffeners severed as aforesaid, simultaneously, and the feed-rolls draw it for-

ward intermittently between said simultaneous operations.

It is not essential that the punching operation be performed prior to heating, as previously described, as the holes  $\alpha$  may be made at any stage in the process prior to severing the stiffeners from the main strand, or even subsequent thereto, if preferred; the special construction of the several devices or appliances of the apparatus is also inessential to the carrying out of my improved process, and I therefore reserve the right to modify the same as circumstances in practice may require.

The main or essential feature of my invention consists in interposing the bending and hardening treatments, between those of heating and tempering, in a continuous, automatic process of treating flat wire for the purpose specified, said hardening being performed by cooling the wire while under compression and in a bent form, and thereby setting it while in said bent form preparatory to being tempered.

I prefer, in practice, the arrangement shown in the drawings; when thus arranged the process of treatment is as follows: Assuming the flat wire from which the stiffeners are to be made, as having been delivered from the rolling mill and coiled on the reel A, it is first passed between the dies of the punching machine B, and the holes  $\alpha$  are made therein at a short distance apart in pairs at stated intervals in the length of the wire, as is shown in Fig. 1, so that when the wire is cut apart between said holes, they will come one at each end of each completed stiffener C, as is shown in Fig. 3. After transferring the wire from the rolling-mill to the reel and thence to and through the punching machine as aforesaid, it is heated by passing it through the usual lead bath in furnace D; it then passes between the forming-blocks  $E^1$ ,  $E^2$  of the wire-bending or shaping machine E, and is bent into a bow shape to form the stiffener C. by lowering the upper block  $E^1$  so as to compress the wire between it and the bottom block  $E^2$ , the contour of the abutting surfaces of the two blocks being made to correspond to the shape that the wire is to be bent into, to form the stiffeners as is shown in Fig. 2. Imme-

diately after said wire is bent, it is hardened by submerging the same in a bath of oil or water, contained in a tank E<sup>3</sup> which the bottom block is arranged in. The operation of  
 5 lowering the upper block to bend the wire, also causing the bottom block to be forced down with it a sufficient distance to submerge the wire in said bath, owing to said bottom  
 10 block resting upon a yielding support, preferably a spring I, which yields to said downward pressure, and exerts a constant upward pressure to hold it in its normal or elevated position when said downward pressure is re-  
 15 moved. In addition to the oil or water in tank E<sup>3</sup>, the cooling or hardening process may be facilitated if desired, by providing a pipe J above the block E', from which a stream of oil or  
 20 water may be poured thereon to keep the same in a cool condition. The wire having been bent and hardened properly, as aforesaid, it then passes into and through a bath of lead in the furnace F, and is thereby tempered;  
 25 the feed-rolls G at stated intervals, it is severed in sections from the end of the strand by the cutters H' of the cutting machine H; said sections or pieces being cut from the main strand centrally between the series of double  
 30 openings formed at regular intervals equidistant apart along the length of the strand as previously specified.

It will of course be understood that the various parts are so arranged and timed in re-  
 35 lation to each other as to feed the strand forward to just the proper point for the various parts of the apparatus to properly act upon it, as hereinbefore described. As, for in-  
 40 stance, when the punching machine is performing its office at one place on the wire, the press or former is bending said wire at another point between two sets of openings, while at still another point the finished stiff-

ener is being severed from the strand, all simultaneously; and when said operations are  
 45 completed, the strand is then fed forward again to the next position that it is to be similarly operated upon, and so on continuously in producing each successive stiffener.

In the drawings I have shown only two  
 50 strands of wire in Fig. 1, but in practice it is designed to treat six or more strands at the same time, as in other processes of a similar nature, and I therefore do not limit myself to any special number.

Those skilled in the art to which my invention appertains will at once perceive the great  
 55 practical advantages derived from the application thereof to practice; not only can a very perfect and uniform product be produced, but the cost of manufacture is reduced to a minimum, owing to the facility with which said  
 60 product may be turned out by an apparatus embodying my improvement as hereinbefore described.

It is obvious that my improved process is applicable to the manufacture of numerous  
 65 articles or goods of different shapes required to be bent to curve the wire as in the present instance and, susceptible of being made from  
 70 a continuous strand of metal, and I therefore do not limit the application thereof to the purpose herein set forth.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

75 The process of making shoe-shank stiffeners by successively subjecting successive portions of a continuous strip of metal to the following steps, to wit: heating, bending into the form of bows, hardening and reheating, sub-  
 80 stantially as and for the purpose set forth.

EDWIN J. WATSON.

Witnesses:

C. FORREST WESSON,  
 FRED. E. BUSS.