(No Model.)

H. H. GARWOOD.

MACHINE FOR MAKING HEEL STIFFENERS.

No. 325,071. Patented Aug. 25, 1885.

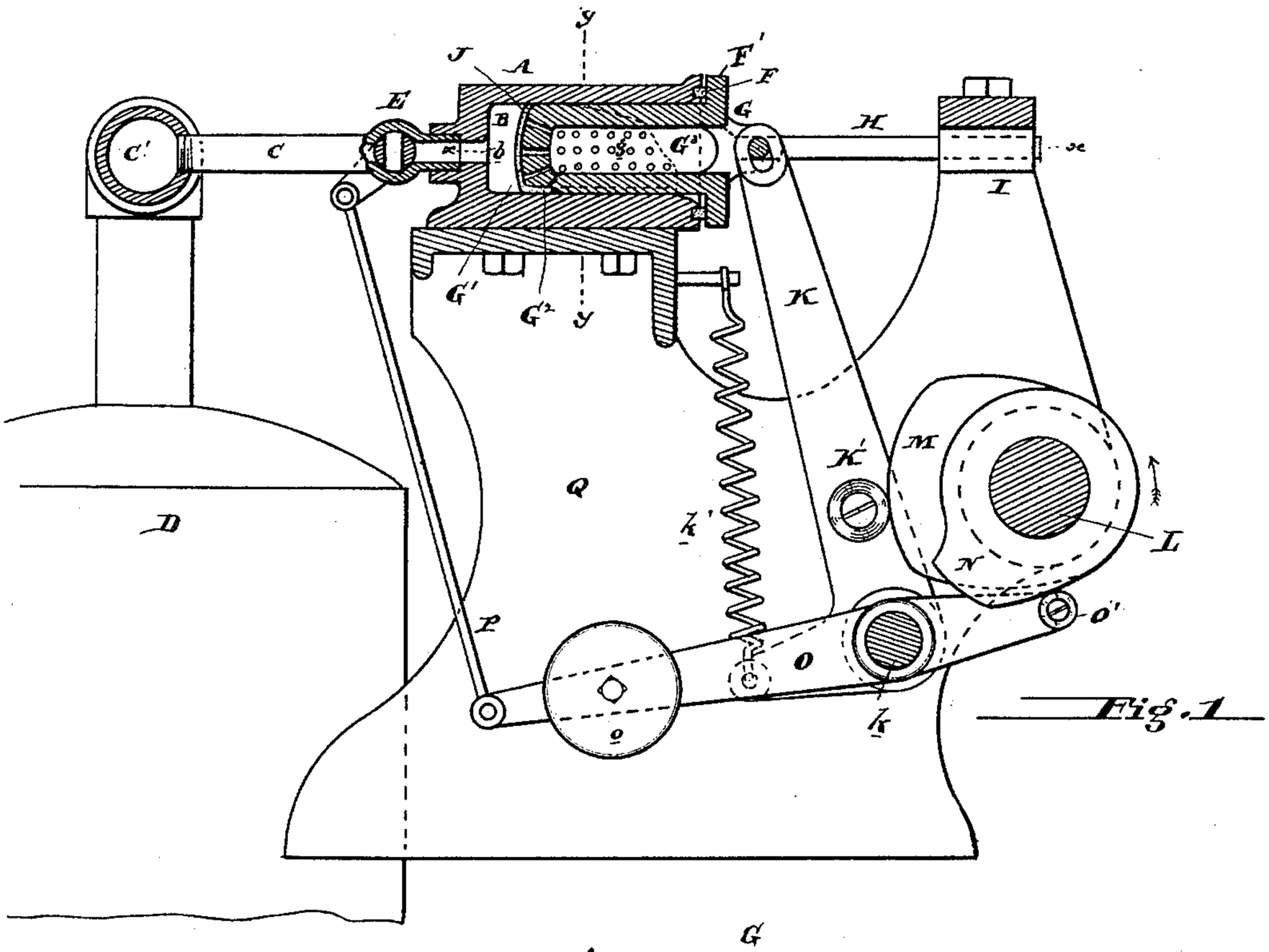

Fig. 1

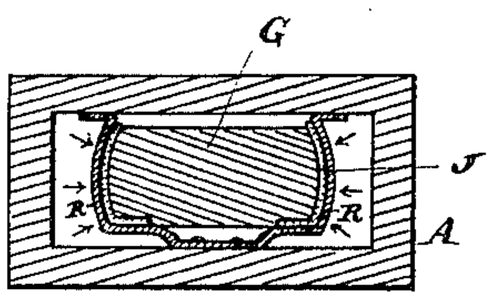

Fig. 4

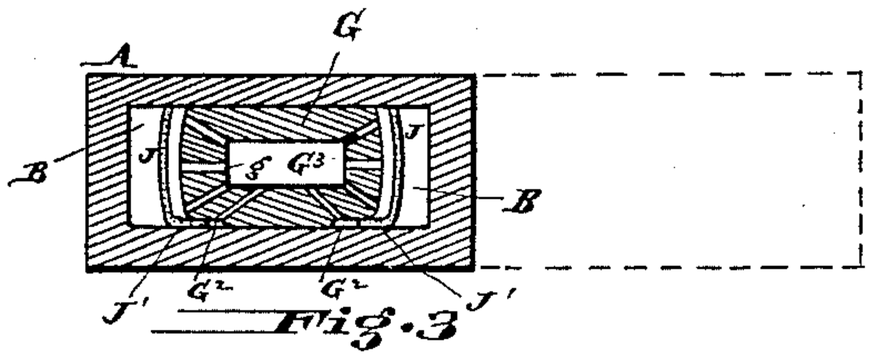

Fig. 3

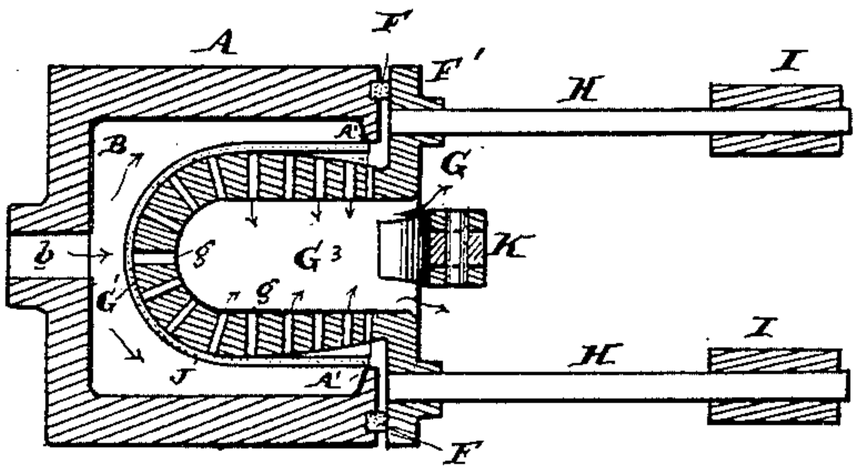

Fig. 2

Attest
G. E. Hummel.
Homer A. Hersl.

Inventor
Henry H. Garwood
By his Atty.
[signature]

UNITED STATES PATENT OFFICE.

HENRY H. GARWOOD, OF TRENTON, NEW JERSEY.

MACHINE FOR MAKING HEEL-STIFFENERS.

SPECIFICATION forming part of Letters Patent No. 325,071, dated August 25, 1885

Application filed February 24, 1885. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. GARWOOD, of the city of Trenton, in the county of Mercer and State of New Jersey, have invented new and useful Improvements in Machines for Making Heel-Stiffeners, of which the following is a specification.

My invention has reference to machines for finishing stiffeners for shoes; and it consists in mechanism adapted to apply air, gas, or vapor under great pressure for the purpose of bending and shaping the leather stiffener, and in details of construction, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

Heretofore stiffeners for boots and shoes have been formed by the application of rollers arranged about a rotating die or form upon which the leather is pressed, or the leather has been formed upon a fixed die by a pair of hinged dies adapted to inclose said fixed die.

The object of my invention is to form stiffeners for boots and shoes without the direct application of either rollers or hinged dies, but in lieu thereof to apply air, gas, or vapor under great pressure in such a manner that it causes the leather blank to curve itself to conform to the shape of the former upon which it is held.

In the drawings, Figure 1 is a sectional elevation of a machine for forming heel-stiffeners embodying my invention. Fig. 2 is a sectional plan view of same on line *x x*. Fig. 3 is a cross-section of same on line *y y*, and Fig. 4 is a similar view of a modification of same in which a flexible diaphragm is used to separate the leather to be formed into the stiffener from the compressed air.

A is the receiver, and is formed of metal, having a chamber, B, open at one end to the atmosphere, and provided at the other or closed end with an aperture, *b*, by which compressed air, gas, or vapor is admitted by means of pipes C C′ from a reservoir, D, and its flow controlled by a valve, E. Working through the open end of said receiver is the former G, having flanges F′, which when the former is thrust into the receiver, as shown in the drawings, the said flange F′ presses upon the packing F in the end of said receiver and forms an air-tight joint. This former is curved to conform to the shape of what the finished stiffener will be, having the curved walls G′ and groove G² about its bottom, into which the flange of the stiffener is forced. This former may be made hollow, as at G³, and the walls G′ and groove G² connected with the atmosphere by apertures *g*. H are guide-rods secured to said former, and are guided in frame I, secured to the frame Q, to which the receiver A is also secured. K is a bell-crank pivoted at *k*, and provided with a roller, K′, which works against the face of a cam, M, secured to shaft L. *k′* is a spring adapted to make the roller K′ follow the irregularities of the cam M. O is another lever, also pivoted at *k*, and is weighted, as at *o;* or a spring might be used. One end of this lever is connected by rod P with the valve E, and the other end carries a roller, *o′*, which works against the cam N, also secured to shaft L.

The operation is as follows: The former G being out, the leather stiffener J, which has been previously bent into the form shown in Fig. 2, is placed upon the said former, and as the cam M rotates the said former is thrust into the receiver A, the edges A′ thereof causing the stiffener to fold into the proper shape if it should have opened. As the cams M and N still rotate, the former has no effect, while the latter suddenly opens the valve E, allowing the high-pressure air, gas, or vapor to rush into the receiver, and which air immediately forces the leather tightly against the face of the former G, bending it into the required shape. The air is then automatically shut off and the former withdrawn with the finished stiffener.

One machine may be provided with a series of receivers and formers, as indicated in Fig. 3.

I do not limit myself to the mechanism shown, as it may be modified in various ways without departing from my invention—for instance, the air may act upon a diaphragm R, (see Fig. 4,) which diaphragm acts upon the leather, which it forces up against the former G, when the compressed air is turned on, by which construction the compressed air or gas does not come into direct contact with the leather being formed. In Fig. 4 the leather is shown as having been formed, the dia-

phragm R, which is secured within the receiving-chamber A, being pressed close up against the leather. This diaphragm may be formed of rubber or any other suitable flexible material, and when used the former G need not necessarily be perforated. The machine may be used for other purposes than the manufacture of heel-stiffeners.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is —

1. In a machine for forming leather into various shapes, the combination of a receiver, into which compressed air, gas, or vapor is forced, and a former upon which the leather is pressed, the former fitting into the receiver, whereby the leather may be caused to conform to the shape of the former by means of the action of the compressed air, and suitable guides by which they may be made to work together, substantially as and for the purpose specified.

2. In a machine for forming leather into various shapes, the combination of a receiver, into which compressed air, gas, or vapor is forced, and a former upon which the leather is pressed, the former fitting into the receiver and forming an air-tight joint at the open end of said receiver, and means for operating the same, substantially as and for the purpose specified.

3. In a machine for forming leather into various shapes, the combination of a receiver, into which compressed air, gas, or vapor is forced, a former upon which the leather is pressed, and a flexible diaphragm to prevent the direct contact of the compressed air and leather to be formed, substantially as and for the purpose specified.

4. In a machine for forming leather into various shapes, the combination of a receiver, into which compressed air, gas, or vapor is forced, and a former upon which the leather is pressed, the former fitting into the receiver and forming an air-tight joint at the open end of said receiver, and provided with apertures through its walls, and means for operating the same, substantially as and for the purpose specified.

5. In a machine for forming leather into various shapes, the combination of a receiver and means for operating the same, into which compressed air, gas, or vapor is forced, a former upon which the leather is pressed, and mechanism, substantially as set forth, to reciprocate said former, substantially as and for the purpose specified.

6. In a machine for forming leather into various shapes, the combination of a receiver, into which compressed air, gas, or vapor is forced, a former upon which the leather is pressed, mechanism, substantially as set forth, to reciprocate said former, and automatic-valve devices to control the flow of compressed air, gas, or vapor into said receiver, substantially as and for the purpose specified.

7. In a machine for forming leather into various shapes, the combination of a receiver, into which compressed air, gas, or vapor is forced, a former upon which the leather is pressed, and a valve to control the flow of air, gas, or vapor into said receiver, substantially as and for the purpose specified.

8. The combination of receiver A, having chamber B, with former G, having groove G^2, air-pipe C, and valve E, and suitable means for operating the same, substantially as and for the purpose specified.

9. The combination of receiver A, having chamber B, pipe C, reservoir D, valve E, former G, lever K, cams M and N, lever O, and rod P, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

HENRY H. GARWOOD.

Witnesses:
R. M. HUNTER,
WILLIAM C. MAYNE.