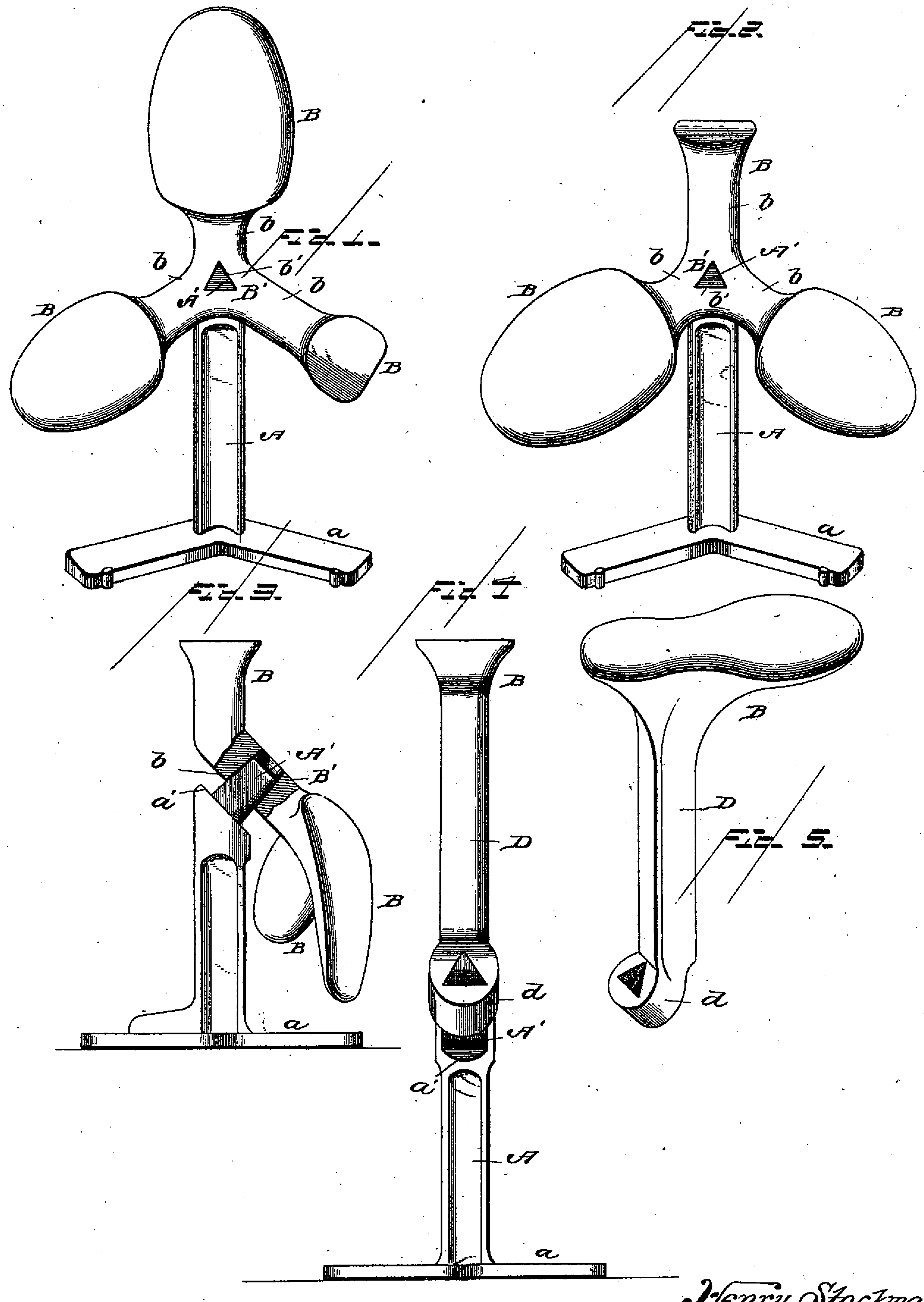
(No Model.) 2 Sheets—Sheet 1.

H. STOCKMAN.

LAST.

No. 374,504. Patented Dec. 6, 1887.



WITNESSES

Henry Stockman,
INVENTOR

By Edson Bros.
Attorney

(No Model.)

2 Sheets—Sheet 2.

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Fig. 8.

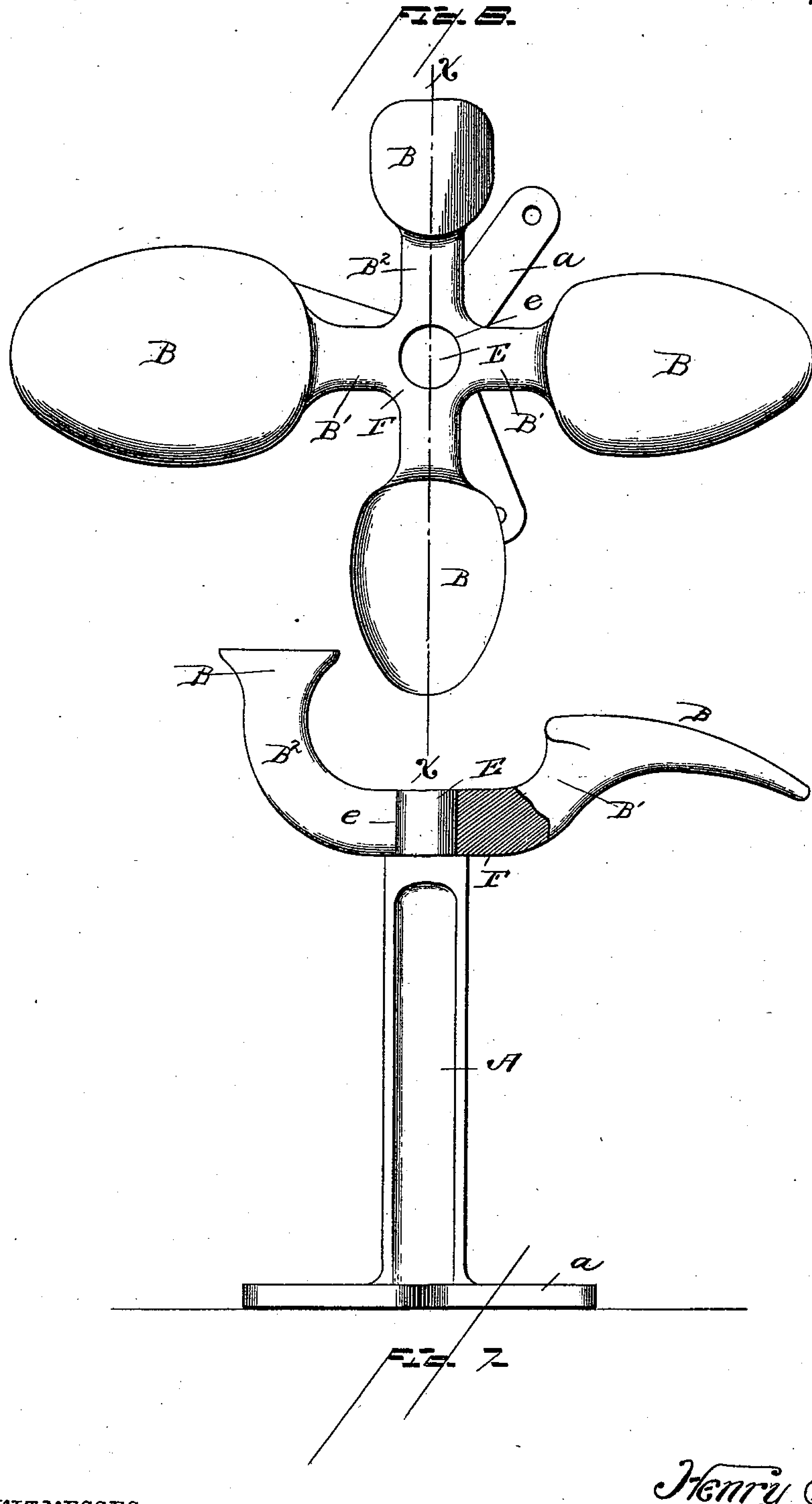

Fig. 7.

WITNESSES
[signature]
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Henry Stockman.
INVENTOR
By Edson Bros.
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UNITED STATES PATENT OFFICE.

HENRY STOCKMAN, OF PHILADELPHIA, PENNSYLVANIA.

LAST.

SPECIFICATION forming part of Letters Patent No. 374,504, dated December 6, 1887.

Application filed May 11, 1887. Serial No. 237,881. (No model.)

To all whom it may concern:

Be it known that I, HENRY STOCKMAN, a citizen of the United States, residing at Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Lasts; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in lasts; and it consists of the peculiar combination of devices and novel construction and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

The primary object of my invention is to provide a compound last, consisting of a series of lasts of assorted varying sizes, which will answer all ordinary purposes and save the shoe-maker the delay and inconvenience of searching through a pile or series of lasts. I also provide a series of lasts with a common support on which they are adjustable to bring either last into proper position to support the shoe or boot to be operated on by the shoe-maker, the lasts not in use being arranged out of the way.

In my improved last I also arrange the radial shanks of the series of lasts so that they meet at a single point and form a common bearing, and the working-surfaces of all the lasts face in the same direction, so that in adjusting the lasts to bring either of them in position for use it is not necessary to invert the same, the lasts being cast in a single piece for convenience and cheapness.

In the accompanying drawings, Figure 1 is a front elevation showing a series of three lasts with one last for the sole of the shoe or boot adjusted in position for use. Fig. 2 is a view corresponding to Fig. 1, but with the heel-last adjusted for use. Fig. 3 is an elevation taken from one side, with the parts in the position shown in Fig. 2, the center of the last being in section to clearly illustrate the angular bearing. Fig. 4 is a front elevation showing an adaptation of my invention to a single last, and Fig. 5 is a detail perspective view of a single last adapted to be supported on the standard. Fig. 6 is a top plan view of my invention showing a series of four lasts, and Fig. 7 is an elevation, partly in section, of the last shown in Fig. 6.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates a vertical fixed standard, and B a series of lasts supported on the standard and adjustable thereon, the peculiar construction of which I will now proceed to describe. The standard is provided with a suitable base, *a*, which is affixed or secured in any preferable manner to the floor, and at its upper end the standard is further provided with a fixed bearing, A′, and a collar or flange, *a′*, which is arranged below the bearing, both the flange and bearing being cast integral with the standard.

The lasts B are each formed with a shank, *b*, which meet at a common center to form a hub, B′, from which the shanks radiate, so that the lasts are arranged at different angles to each other.

The lasts are of the ordinary shape or pattern known to the trade, and I provide a single last for the heel and two or more for the soles, which are of different sizes, as shown.

These lasts and the hub are cast or formed in a single piece of metal, and the shanks are curved or inclined to bring the lasts for the soles into substantially the same horizontal plane, the shank of the heel-last being curved to cause the latter to lie at an angle to the plane of the sole-lasts, for a purpose which will presently appear.

The bearing A′ of the fixed standard is arranged at an angle to the vertical plane of the standard, and it is made angular in cross-section to prevent the lasts from turning thereon, the bearing being triangular in cross-section for the three lasts shown in Figs. 1, 2, and 3, and where a greater number of parts are employed the shape of the bearing in cross-section is changed to cause it to have a corresponding number of sides.

The central hub, B′, of the series of integral lasts is formed with a triangular opening, *b′*, which corresponds in size with the angular bearing of the fixed standard. The angular

bearing is adapted to fit snugly in the central opening of the hub of the connected lasts to properly support the lasts in a fixed position and prevent them from turning while the shoe is being operated on, and the lasts can be readily disconnected by hand from the bearing and turned to adjust another last into proper position, after which the angular bearing is again fitted in the opening *b'* to hold the lasts in position.

The lasts are supported by the angular bearings in an inclined position with relation to the vertical plane of the standard, and the last that is adjusted for use is arranged above the upper end of the standard to receive the work, while the lasts that are not in use are arranged below the first-named last and at the opposite side of the standard out of the way of the workman.

The sole-lasts, when adjusted for use, assume, approximately, a horizontal position above and on one side of the fixed standard, as in Fig. 1, but the heel-last lies immediately above and in line with the vertical standard, as seen in Figs. 2 and 3, so that the jar and shock of the hammer are delivered on the last directly in the vertical plane of the standard.

The working-surfaces of the series of lasts B all face in the same direction, and in adjusting the parts it is only necessary to turn them and bring the proper last uppermost, the operation of inverting the lasts, referred to in my prior patent, being entirely dispensed with in this construction, and thereby enable the parts to be adjusted with more ease and facility.

The operation of my invention is obvious from the foregoing description. To bring one of the lasts above the standard in position for use, the lasts are first disconnected by hand from the standard, then turned or rotated slightly, without inverting the same, until the desired last assumes the proper position, and then again connecting the lasts to the standard by adjusting or moving the lasts inwardly toward the standard to cause the bearing thereof to enter the central opening. It will be noted that the bearing holds the lasts in their relative positions without regard to the strain on the parts, and the lasts can be easily and quickly turned without compelling the workman to leave his seat. I thus provide a multiplicity of lasts for a variety of uses, which possess the necessary strength and rigidity, and can be manufactured very cheaply.

For special purposes a single sole or heel last may be employed. In Figs. 4 and 5 I illustrate such lasts, each of which is provided with a short vertical standard, D. The lower end of the standard is formed with an integral eye, *d*, which is disposed at an angle to the vertical plane of the standard, whereby the standards A D can be readily connected together to support the last in position for use, the standards being arranged in line with each other.

In Figs. 6 and 7 I illustrate a standard having an integral vertical bearing, E, which is made circular in cross-section and fits snugly into a circular opening, *e*, formed in the center of a hub, F. This hub has a series of lasts, preferably four in number, and the hub and its lasts are arranged in substantially the same horizontal plane. The hub and the lasts are capable of a horizontal rotary movement on the central vertical bearing, which thus serves as a pivot. The lasts can be readily detached by merely lifting them up from the standard, and they can be rotated with ease to arrange any one of the same nearer to the operator, for use. In this form of my invention the lasts also face in one direction, and are cast in a single piece of metal.

I would state that while I deem the mechanisms and devices herein shown and described as best adapted for carrying my invention into effect, still I do not desire to be limited to the exact details of construction and form and proportion of parts herein shown and described, as I am aware that changes therein can be made without departing from the spirit or sacrificing the advantages of my invention.

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

1. As an improved article of manufacture, the compound last herein described, comprising a series of lasts having their working-surfaces facing in the same direction, substantially as and for the purpose set forth.

2. As an improved article of manufacture, the compound last herein described, cast in a single piece and consisting of a series of lasts of assorted sizes, having the radial shanks meeting at a single point and forming a common bearing, the working-surfaces of all the lasts facing in one direction, substantially as described.

3. As an improved article of manufacture, the compound last cast in a single piece and consisting of a series of lasts of assorted sizes, the sole-lasts being arranged in substantially a horizontal plane and the shank of the heel-last being curved at an angle to a line drawn through the sole-lasts, as and for the purpose described.

4. In a compound last, the combination of a fixed standard having a bearing angular in cross-section and a series of lasts having an angular socket for the reception of the bearing, substantially as described.

5. The combination of a fixed standard provided with a bearing disposed at an angle to the vertical plane of the standard and the series of lasts mounted on the bearing, substantially as described.

6. The combination, with a suitable standard, of a series of integral lasts detachably mounted on the standard and arranged in a vertically-inclined position, substantially as described, with relation thereto, each last being connected with the others of the series in such manner as to assume approximately a

horizontal position when adjusted for use, substantially as described.

7. The combination of a standard having an integral bearing projecting therefrom and disposed at an angle to the vertical axis of the standard, said bearing having its sides arranged at an angle to each other, and a compound last having a socket into which the bearing is fitted, substantially as described, and for the purpose set forth.

8. The combination of a standard provided with a bearing angular in cross-section and a series of lasts having a correspondingly-shaped socket for the reception of the bearing, the shanks of each last being curved or inclined to cause the last to assume substantially a horizontal position when adjusted for use, as set forth.

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

HENRY STOCKMAN.

Witnesses:

WM. HELMICK,

H. K. BERNHARD.