Jan. 5, 1932. H. L. CHAPIN 1,839,199

DEVICE FOR ASSEMBLING SHOE PARTS

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Fig. 1.

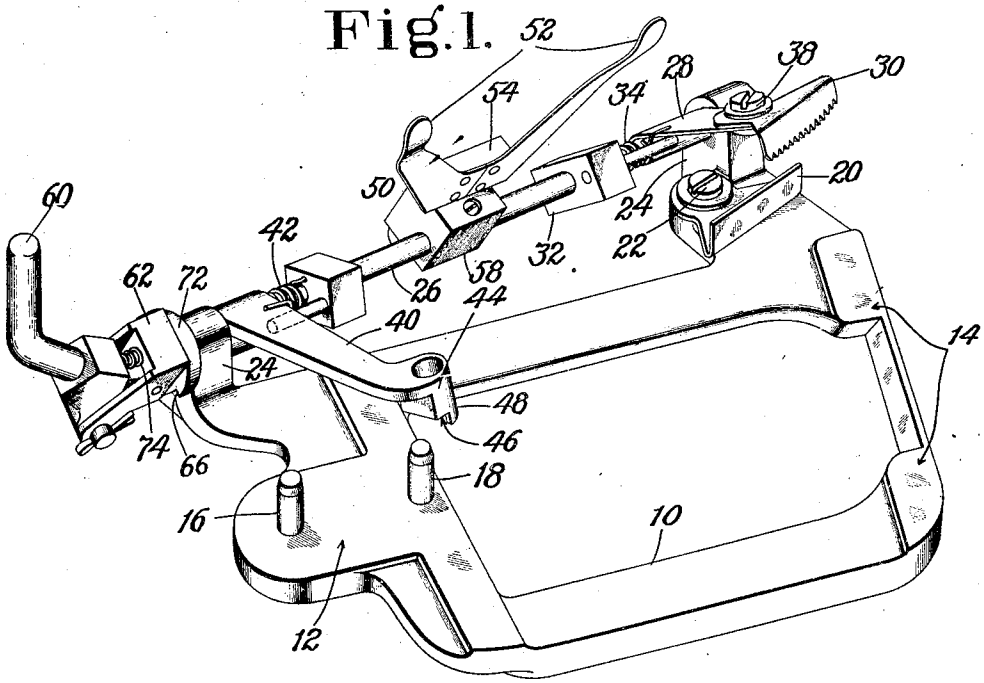
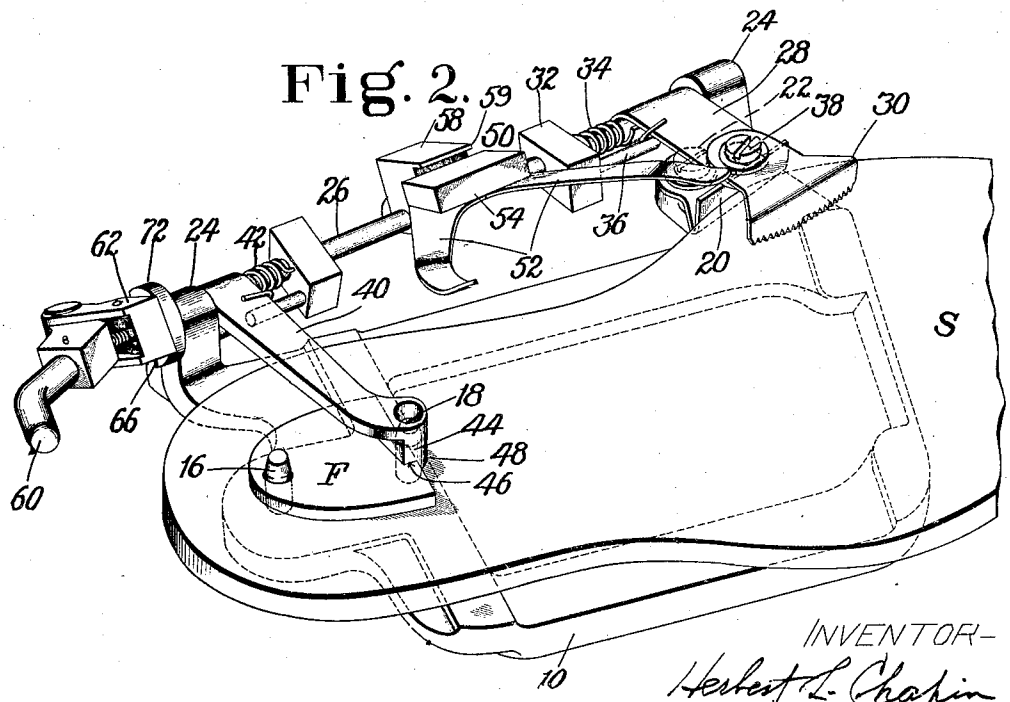


Fig. 2.



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Fig. 3.

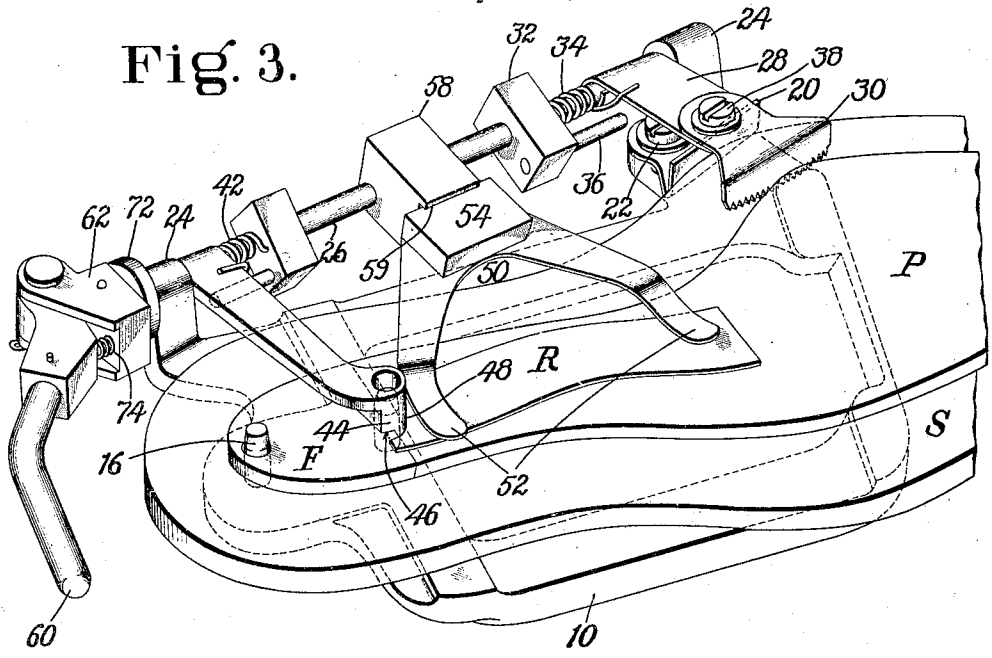


Fig. 4.

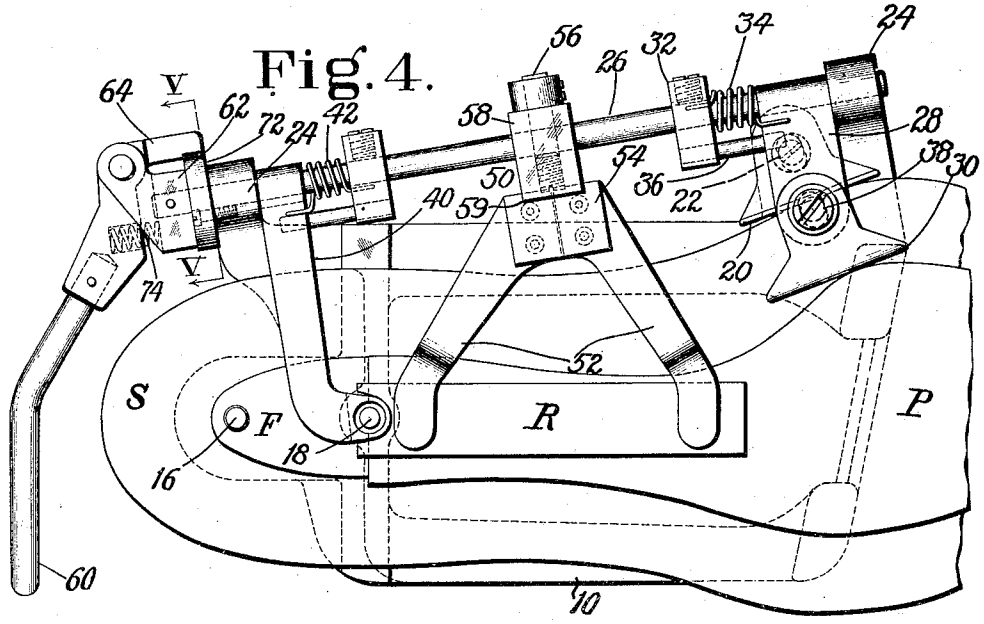
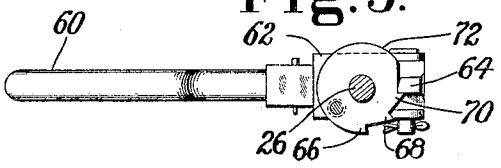


Fig. 5.



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UNITED STATES PATENT OFFICE

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DEVICE FOR ASSEMBLING SHOE PARTS

Application filed April 19, 1928. Serial No. 271,282.

My invention relates to devices by which there may be held in definite relation to one another such parts of shoes as those which go to make up the bottom-portion, these including, for example, a sole, one or more filler-piece sections, and a shank-reinforcement.

In certain connections, it may be desirable to produce a bottom-unit, including parts of the character indicated above, this unit having its elements so attached that it may be secured to the insole and upper of a shoe by a single operation, the filler-piece registering with the space over the insole between the inner edges of the welt. An object of this invention is to insure that the bottom-unit parts or elements to be thus assembled are positioned in a series superposed successively on one another, and so held until they have been secured to one another to form the unit. In attaining this object, I provide a novel organization comprising a plurality of movable members adapted to both gage and hold shoe-parts, the particular form of the invention herein disclosed being arranged to locate and clamp a sole with one section of a filler-piece, and then to locate with reference to said sole and filler-piece section another filler-piece section and a shank-reinforcement, and clamp these. More specifically, I pivot to a supporting member, shown as an open base-frame, as by a spindle rotatable thereon, a plurality of work-holding arms or members, which, as the spindle turns, become successively effective to clamp pieces applied to the base and to one another. The base carries one or more gage members, which locate the parts first applied, an arm or arms which hold these being provided with gage-surfaces, which serve to position parts later applied. Yieldability of the arms is provided for to allow both their proper successive action and their accommodation to irregularities of surface. The spindle may be turned by means, as a handle, common to all the arms and locked against reverse movement, as by means engaged by said handle. Positioning means is shown upon one of the arms or engaging members for locating the work, and a co-operating movable member, as another of the arms, may not only hold the engaged part in place, but may also space another part from its positioning means. In the present instance, a projection from the base member is surrounded by a portion of an arm, which thus may clamp beneath it a part positioned by the projection and locate another part in proximity to the pin but spaced therefrom. This is of particular utility when operating upon material containing pitch or other adhesive substance which might be transferred to locating projections of machines which are to operate upon the work, since the operations of these machines might be interfered with by the deposit of the sticky material.

In the accompanying drawings illustrating a particular embodiment of this invention,

Fig. 1 shows my improved clamping device in perspective, with the holding arms raised to receive the work-parts;

Figs. 2 and 3 are similar views, illustrating, respectively, the clamping of the sole and heel-filler-piece section and the forepart-filler-piece section and shank-reinforcement;

Fig. 4 is a top plan view of the device, with its elements in the relations shown in Fig. 3; and

Fig. 5 is a transverse sectional detail on the line V—V of Fig. 4.

At 10 appears a base member, which may be in the form of an open frame, the opposite solid ends of which have raised work-supporting surfaces 12 and 14. Rising from the surface 12 are pins or projections 16 and 18, spaced along the longitudinal axis of the frame. These pins are arranged to enter correspondingly spaced openings in such a shoe-bottom part as an outsole S, and also enter a rear opening and a depression at the forward edge of a heel-filler-piece F. The engagement with the pins of the filler-piece section locates it with sufficient accuracy with respect to the sole upon which it rests. But, on account of the length of said sole, I prefer to provide for the forepart a vertical gage-surface upon a member 20 attached at one side of the base by a slot-and-screw connection 22. This connection, giving both an angular adjustment and a movement toward

and from the longitudinal axis of the frame, permits the device to be adapted for soles intended for widely different sizes and styles of shoes. Generally, however, change of this gage member is not necessary when contact-points upon the soles of a line of sizes are so chosen that they lie along the line furnished by the gage. Such points are somewhat at the rear of the maximum width of the forepart, where it merges into the opposite curve of the shank-portion.

From the same side of the base as that at which the gage 20 is fixed rise spaced brackets 24, 24, in which is rotatably mounted a spindle 26. Arranged to turn about the forward extremity of the spindle is an arm 28 having an angular contact-portion 30, which may be toothed at its lower extremity to cause it to better retain against displacement from the gage-wall a sole upon which it rests. Secured to the spindle, near the arm 28, is a block 32, and connecting this and the arm is a torsion-spring 34, which forces the arm yieldably down against a projection 36 from the block but permits it to yield circumferentially of the spindle. By this arrangement, when the arm is moved by rotation of the spindle into contact with a sole, continued rotation of the spindle is permitted, so that other members which it carries may be successively brought into clamping engagement with other bottom-parts. The vertical inner wall of the contact-portion 30 of the arm 28 serves as a gage to position angularly a forepart-filler-piece P when this is applied to the sole S. The point of engagement between the gage 30 and the filler-piece section P may, as with the sole, allow the desired locating effect transversely of the sole for different sizes. But to provide for possible extremes, the portion 30 may be adjustable upon a slot-and-screw connection at 38 to the arm 28.

The sole S and the heel-filler-piece F may be placed upon the base together, and positioned in the correct relation to each other by the pins 16 and 18 and the gage 20; and to hold the rear extremity of the sole and the heel-filler-piece against the base as the forepart of the sole is clamped by the arm 28, there is carried by the spindle 26, near the end opposite the arm 28, an arm 40. This has a yieldable connection at 42 to the spindle, similar to that of the companion arm, and is shown as provided with a depending end-portion 44, in which is an opening registering with the pin 18 during the movement of this arm. The lower end of the portion 44 is recessed to receive the forward edge of the filler-piece F, a surface 46 bearing upon the piece to clamp it and a semi-cylindrical wall 48 surounding the forward side of the pin 18 beyond the filler-piece. Against this peripheral wall 48 is placed a depression in the forepart-filler-piece P, and a like depression in the shank-reinforcement R. This locates the rear extremities of both the elements P and R with reference to the previously clamped pieces, both longitudinally and transversely of the sole S. The forward part of the filler-piece P is positioned angularly by bringing it into engagement with the gage-wall of the portion 30, by which the sole is clamped. The exact angular relation of the shank-reinforcement is not important, and its forward end may be located transversely of the filler-piece P, on which it rests, by the operator without a gage.

The clamping of the piece P and the reinforcement R is preferably effected by an arm 50, the separated ends 52, 52 of which bear upon the reinforcement near its opposite extremities. The arm 50 is so mounted upon the spindle between the arms 28 and 40 that it is at a greater angular distance from the base 10 than are the associated arms when these elements are raised to their work-receiving positions. It is also arranged to adapt itself to differences in thickness and surface-inclination of the parts held. For this purpose, the spaced portions 52, 52 may be of spring-metal, secured to a block 54, at the outer side of which is a stem 56 lying substantially at right angles to the spindle and swiveled in a carrier-block 58 fast upon the spindle 26. The clamping portions 52 therefore not only yield by virtue of their resilience, but also by rocking bodily about the axis of the stem. A perfect accommodation is therefore obtained, both with reference to each other and to the companion arms, when pressure is applied to the work. An overhanging portion 59 of the block 58 limits the extent to which the block 54 may turn. The arm-portions 52 are thus never permitted to swing beyond a proper work-engaging position.

The spindle and arms may be turned to produce clamping of the work-parts by a handle 60 fulcrumed upon a head 62 secured to the end of the spindle. From the handle is a projection 64 extending substantially parallel to the spindle. This projection co-operates with a series of teeth 66, 68, 70 formed upon a disk 72 secured to the outer side of the adjacent bracket 24. A spring 74, interposed between the handle and the head 62, exerts its expansive force to press the projection 64 against the edge of the disk 72 into co-operation with its teeth. The tooth 66, by its contact with the projection 64, limits the movement of the arms away from the base 10, holding them normally elevated above the base in positions convenient for the introduction of the parts to be clamped. When the handle and therefore the arms are turned in a clockwise direction, as viewed in Figs. 1 to 3 of the drawings, the tooth 68 retains the arms 28 and 40 in the correct positions for clamping the sole S and heel-filler-

piece F. With the projection in engagement with the tooth 70, the portions 52 of the arm 54 are located for clamping the shank-reinforcement R and the forepart-filler-piece P.

Assuming that a bottom-unit, made up of the outside S, heel- and forepart-filler-piece sections F and P, respectively, and shank-reinforcement R, is to be assembled, the device may be utilized in the following manner: The handle 60 being raised, as is shown in Fig. 1 of the drawings, and retained by the frictional engagement of its spring-pressed projection 64 with the disk 72, the operator first places upon the base 10 the sole and heel-filler-piece together, the openings in the former and the opening and depression in the latter receiving the pins 16 and 18. The desired relation of the sole transversely of the base is insured by its contact with the gage 20. Now the handle is turned down, as illustrated in Fig. 2, causing the arm 28 to engage and clamp the sole and the arm 40 to correspondingly hold both the sole and heel-filler-piece. Yield of the arms at their spring-connections 34 and 42 to the spindle allows the pressure to be equalized, and the reaction of the springs also holds the projections 64 of the handle against the tooth 68, thus locking the arms against reverse movement. Following this, the forepart-filler-piece section P and the shank-reinforcement R are laid superposed upon the sole against the gage wall 48 of the arm 40, which precisely locates these portions with respect to the projection 18, but avoiding contact with said projection. The other end of the forepart-filler-piece is gaged by bringing it against the wall of the sole-engaging portion 30 of the arm 28. The position of the forward end of the shank-reinforcement across the filler-piece may be fixed approximately by the operator. Finally, the handle is depressed to bring the portions 52, 52 of the intermediate arm upon the opposite extremities of the shank-reinforcement, these adjusting themselves angularly of the work by the turning of the stem 56. The resilience of these contact-portions, added to the force of the spring-connections 34 and 42, retains the projection of the handle against the tooth 70, all the arms being now locked to clamp the entire bottom-unit assembly upon the base with all the parts in correct relation to one another. To secure the thus-clamped parts, staples may be driven through all the elements at any desired points. Freedom from interference of the clamping device with this operation is assured by the opening of the frame 10. Through this the staple inserting or other fastening-inserting mechanism may operate over the forepart of the sole, the frame being so tipped during the operation that the fastening is driven substantially at right angles to the surface. Inward pressure upon the handle releases it from the tooth 70, and allows it to be turned up to its initial position against the tooth 66. The assembled bottom-unit is thus freed from the arms, and may be removed from the base-pins, leaving the device ready for the succeeding operation.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a clamping device for shoe-parts, members movable to hold elements of a shoe in a series superposed successively one upon another, each of a plurality of the members being movable independently of the others and arranged to clamp different elements of the series, each of such independently movable members being provided with a gage-portion arranged to position another shoe-element succeeding in the series that clamped, and means for holding the elements thus positioned.

2. In a clamping device for shoe-parts, a work-engaging member provided with means for positioning the work upon the member, and a second work-engaging member co-operating with the first and having means movable into position to space work-parts from the positioning means.

3. In a clamping device for shoe-parts, an open frame, sole-holding members movable into co-operation with the frame over surfaces thereof near its opposite ends, and a holding member movable for contact with a bottom-part upon the sole over the opening in the frame.

4. In a device for holding shoe-parts, three clamping members pivotally connected, two of said members being arranged for movement successively into engagement with different parts to be clamped, one of said members being yieldable about its pivotal connection and the third member being secured against movement about its mounting, and means acting upon the pivotal connections and arranged to effect the movement of all the members.

5. In a device for holding shoe-parts, three clamping members pivotally connected, two of said members being arranged for movement successively into engagement with different parts to be clamped, one of said members being yieldable about its pivotal connection and the third member being of flexible material and secured against movement about its mounting, and means acting upon the pivotal connections and arranged to effect the movement of all the members.

6. In a device for holding shoe-parts, three clamping members pivotally connected, two of said members being arranged for movement successively into engagement with different parts to be clamped, one of said members including a carrier fixed against movement about its mounting, and means

swiveled upon the carrier and arranged for engagement with a part to be clamped.

7. In a device for holding shoe-parts, three clamping members pivotally connected, two of said members being arranged for movement successively into engagement with different parts to be clamped, one of said members being yieldable about its pivotal connection and the third member being secured against movement about its mounting but arranged to turn about an axis substantially at right angles to the mounting.

8. In a device for clamping shoe-parts, members relatively movable to successive positions to hold shoe-parts, one of said members having a projection arranged to pass through a part clamped and another member being provided with means arranged to space a part clamped from the projection.

9. In a device for assembling shoe-bottoms, a base upon which a sole may be supported, an arm pivoted upon the base for contact with the supported sole, and an arm pivoted upon the base for contact with a shoe-part applied to the sole.

10. In a device for assembling shoe-bottoms, a base upon which a sole may be supported, an arm pivoted upon the base for contact with the supported sole, and two arms pivoted upon the base to act respectively upon different filler-piece sections applied to the sole.

11. In a device for assembling shoe-bottoms, a base upon which a sole may be supported, an arm pivoted upon the base for contact with the supported sole and provided with a gage-surface arranged to locate a filler-piece upon the supported sole, and an arm pivoted upon the base to act upon the filler-piece located by the gage-surface.

12. In a device for assembling shoe-bottoms, a base upon which a sole may be supported, a sole-gage adjustable upon the base, an arm pivoted upon the base for contact with the supported sole, and an arm pivoted upon the base for contact with a shoe-part applied to the sole.

13. In a device for assembling shoe-bottoms, a base upon which a sole may be supported, an arm pivoted upon the base for contact with the supported sole, the portion contacting with the sole being adjustable upon the arm, and an arm pivoted upon the base for contact with a shoe-part applied to the sole.

14. In a device for assembling shoe-bottoms, a base, a spindle rotatable thereon, and a plurality of contact-arms rotatable by the spindle, said arms being mounted to yield circumferentially of the spindle and arranged for successive engagement with shoe-bottom elements.

15. In a device for assembling shoe-bottoms, a base, a spindle rotatable thereon, a contact-arm rotatable about the spindle for co-operation with the base, a member fixed to the spindle, and a spring connecting the member and arm and arranged to force said arm into engagement with a portion of the member.

16. In a device for assembling shoe-bottoms, a base, a spindle rotatable thereon, and an arm carried by the spindle and rotatable about an axis substantially at right angles thereto, said arm being provided with separated portions for contact with a part applied to the base.

17. In a device for assembling shoe-bottoms, a base, a spindle rotatable thereon, a carrier member fixed to the spindle, and a member having a stem turning in the carrier member and separated contact-portions co-operating with the base.

18. In a device for assembling shoe-bottoms, a base, a spindle rotatable thereon, two arms rotatable by the spindle and being mounted to yield circumferentially thereof, and an arm carried by the spindle between the yieldable arms and rotatable about an axis substantially at right angles thereto, said arm being provided with separated portions for contact with a part applied to the base.

19. In a device for assembling shoe-bottoms, a base, a spindle rotatable thereon, two arms spaced from each other along the spindle and being yieldable circumferentially thereof, and an arm carried by the spindle between the spaced arms and being normally separated farther from the base member than the companion arms.

20. In a device for assembling shoe-bottoms, a base, a spindle rotatable thereon, two contact-arms spaced from each other along the spindle and being yieldable circumferentially thereof, a contact-arm carried by the spindle between the spaced arms and being normally separated farther from the base member than the companion arms, and means for resisting reverse movement of the arms from their contact-positions.

21. In a device for assembling shoe-bottoms, a base upon which a sole may be supported, an arm pivoted upon the base for contact with the supported sole, an arm pivoted upon the base for contact with a shoe-part applied to the sole, and means effective after the advance of the arms through different distances to their contact-positions for resisting their reverse movement.

22. In a device for assembling shoe-bottoms, a base, means for positioning shoe-bottom elements upon the base, a spindle rotatable upon the base, an arm carried by the spindle for co-operation with the base, a handle mounted upon the spindle, and means co-operating with the handle for locking the spindle to prevent movement of the arm from the base.

23. In a device for assembling shoe-bot-

toms, a base, a spindle rotatable upon the base, an arm carried by the spindle for co-operation with the base, a handle fulcrumed upon the spindle, and a relatively fixed locking projection arranged for engagement by the handle.

24. In a device for assembling shoe-bottoms, a base, a spindle rotatable upon the base, arms carried by the spindle at different angular distances from the base, a handle mounted upon the spindle, and a series of relatively fixed projections with which the handle may contact.

25. In a device for assembling shoe-bottoms, a base, a work-positioning projection on the base, and a work-engaging member mounted upon the base, a peripheral portion of the member providing a work-positioning surface surrounding the projection.

26. In a device for assembling shoe-bottoms, a base, a work-positioning projection on the base, and a work-engaging member mounted upon the base and having an opening to receive the base-projection and a gage-surface about the opening.

27. In a device for assembling shoe-bottoms, a base provided with a projection arranged to enter an opening in a sole-part, and a plurality of arms movable upon the base to engage parts positioned by the projection, one of the arms directly co-operating with the projection.

28. In a device for assembling shoe-bottoms, a base provided with a projection arranged to enter an opening in a shoe-part, and a shoe-part-clamping member movable relatively to the base and having a surface arranged to position a shoe-part other than that which it clamps.

In testimony whereof I have signed my name to this specification.

HERBERT L. CHAPIN.