

No. 881,994.

C. L. ALLEN. PA
SOLE ROUNDING MACHINE.
APPLICATION FILED NOV. 28, 1902.

PATENTED MAR. 17, 1908.

2 SHEETS—SHEET 1.

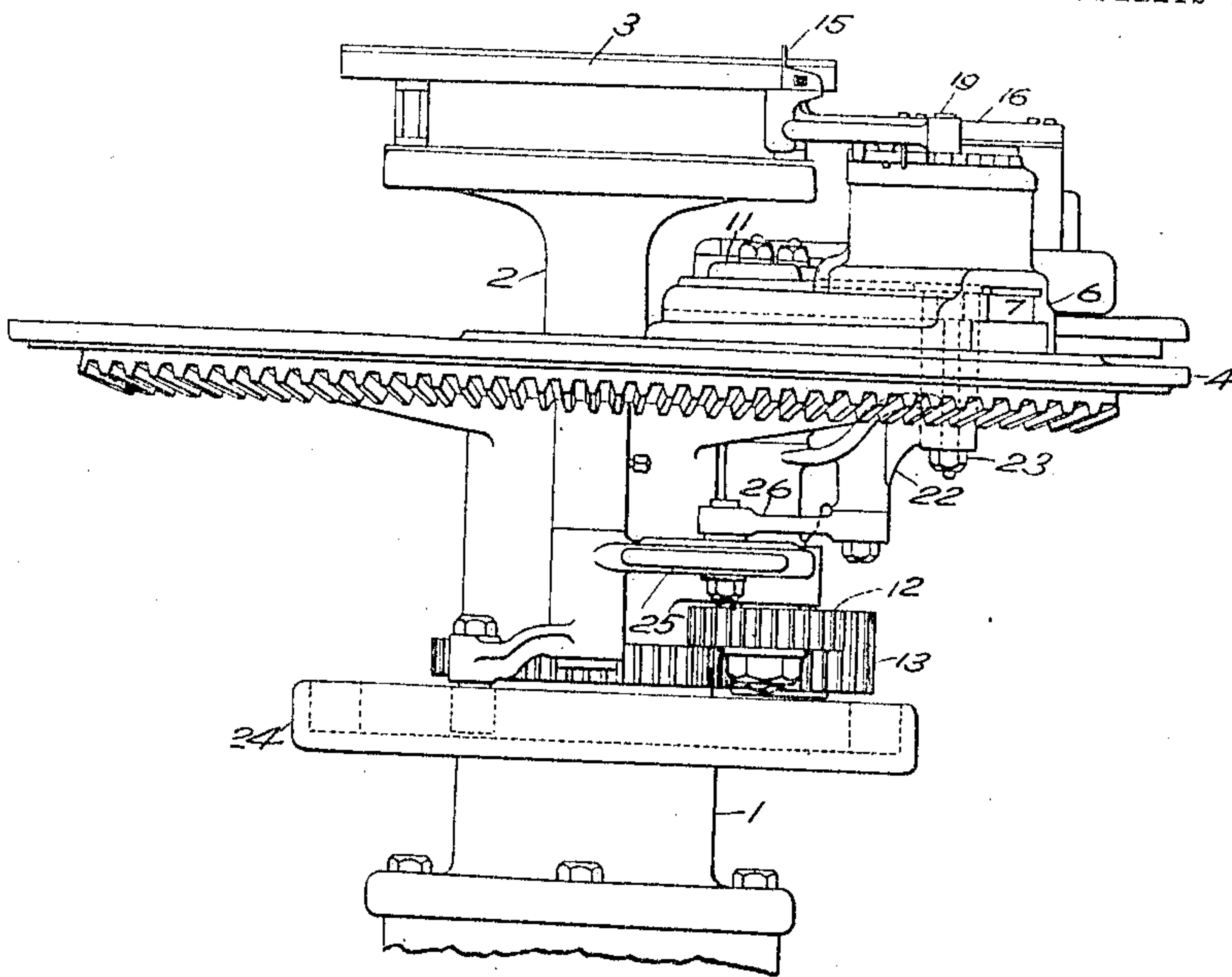


FIG. 1.

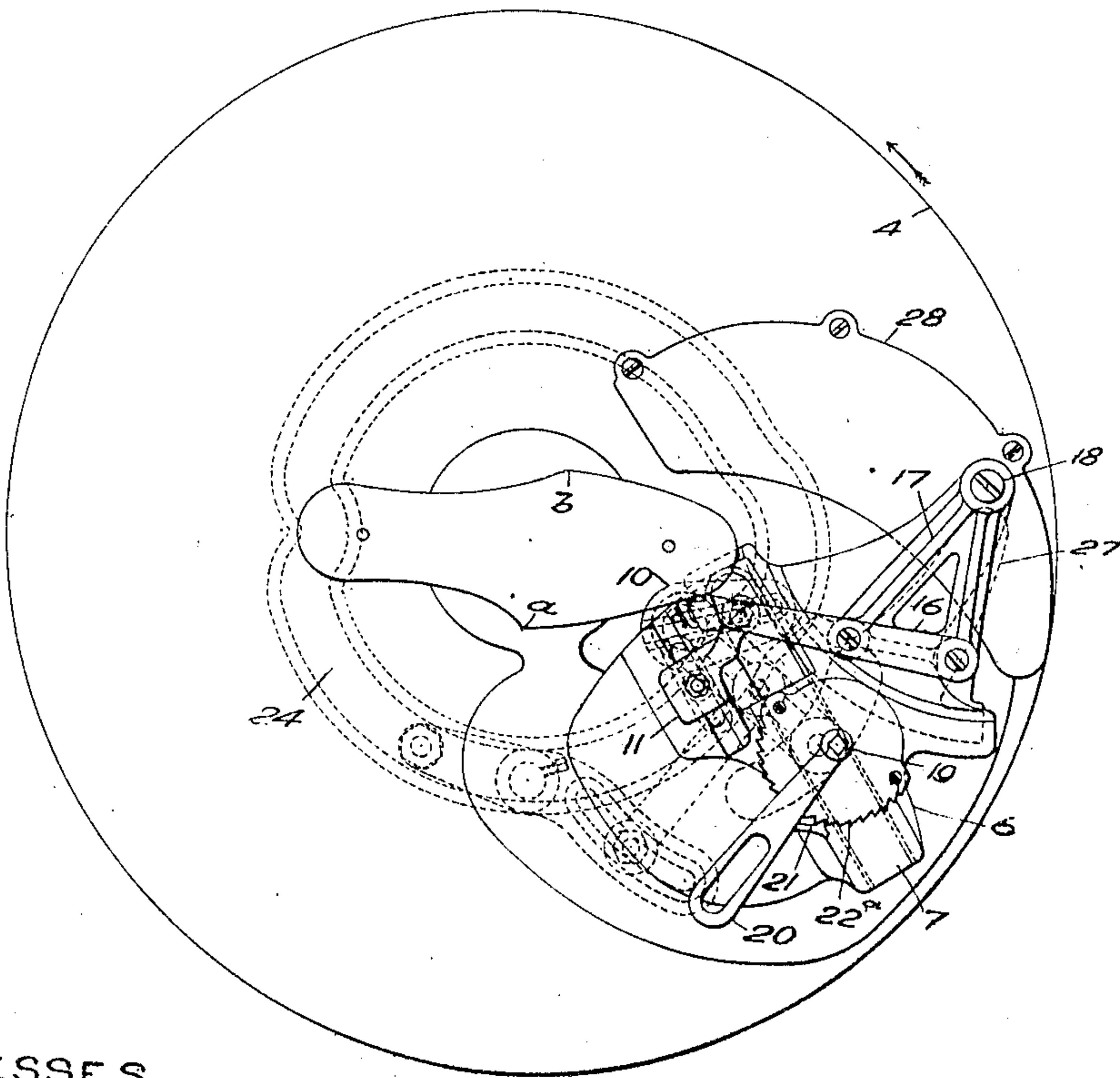


Fig. 2.

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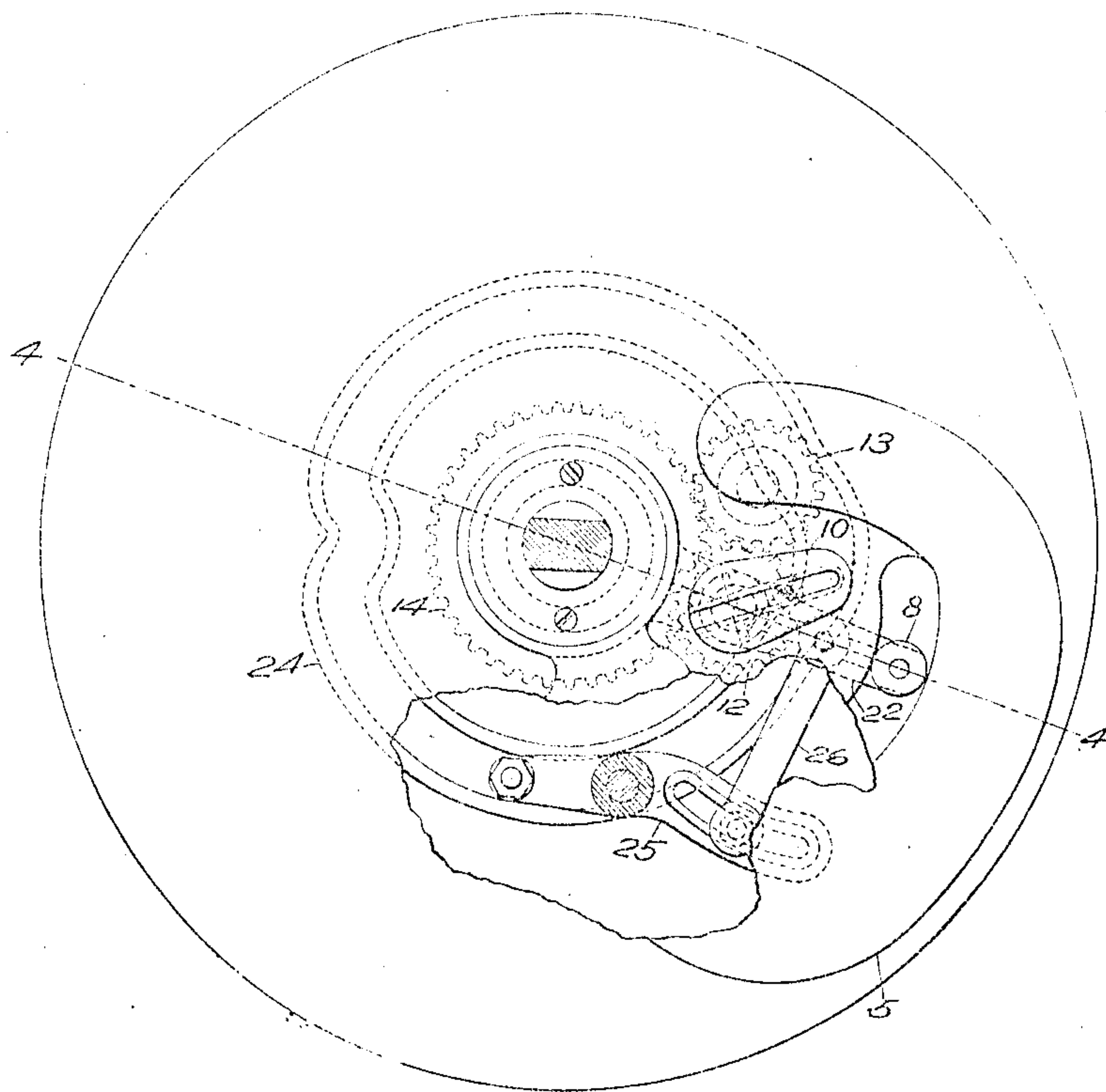


FIG 3

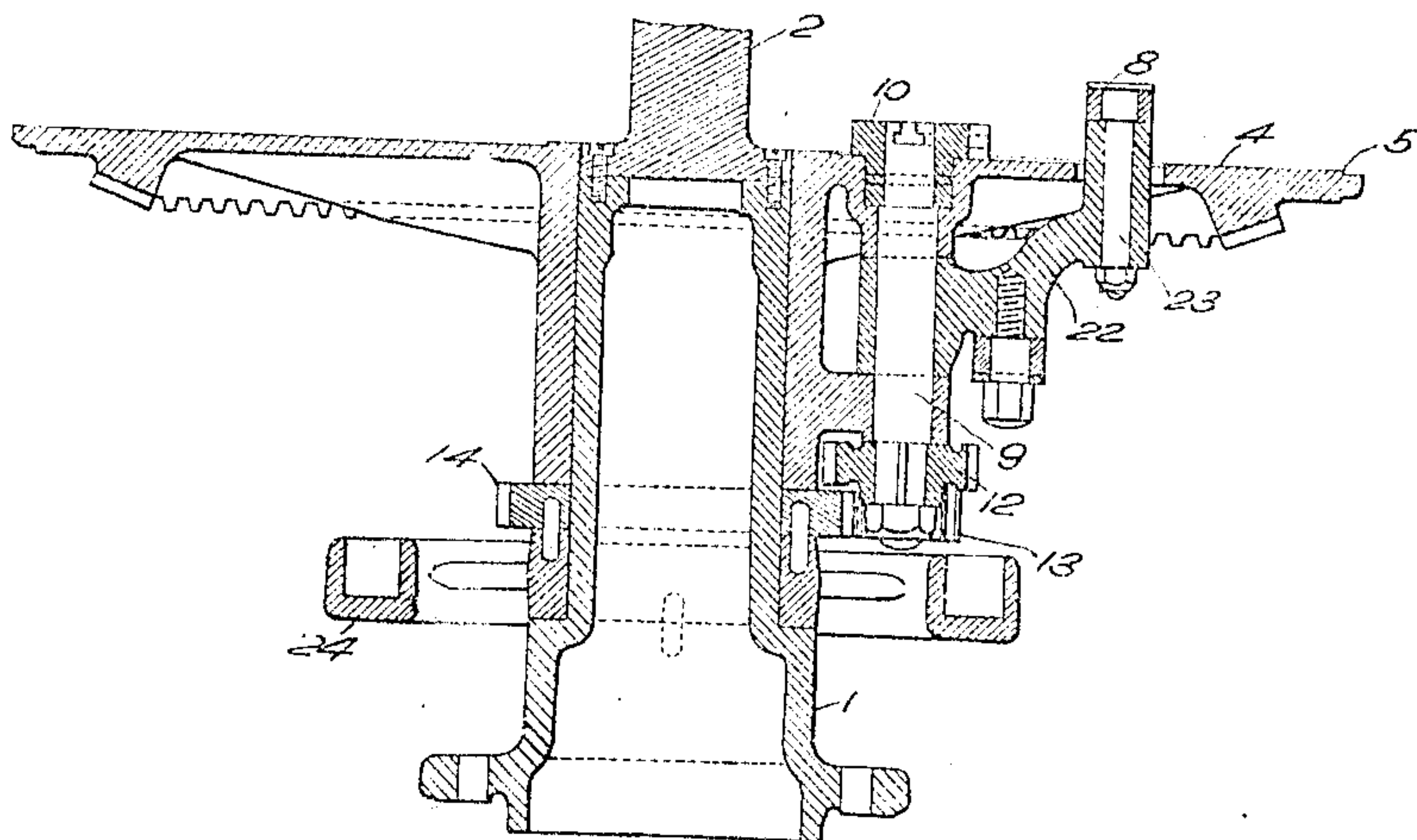


FIG. 4

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UNITED STATES PATENT OFFICE.

CHARLES L. ALLEN, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOLE-ROUNDING MACHINE.

No. 881,994.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed November 28, 1902. Serial No. 133,076.

To all whom it may concern:

Be it known that I, CHARLES L. ALLEN, a citizen of the United States, residing at Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Sole-Rounding Machines; and I do hereby 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.

The present invention relates to sole rounding machines of that class which comprise a pattern, a rounding knife, and means for relatively moving the pattern and rounding knife to cause the knife to travel around the pattern.

The invention is intended primarily as an improvement on the well-known Julian sole rounding machine, types of which are disclosed in United States Letters Patent to Gideon Julian, No. 528,128, dated October 23, 1894, and No. 663,656, dated December 11, 1900. In the machine shown in these patents the pattern upon which the sole is clamped is stationary and the rounding knife is mounted upon a support which is rotated to carry the knife around the pattern. While my invention in its preferred form is embodied in a machine of this general type in which the relative movement of the pattern and knife is produced by moving the knife around a stationary pattern, as such a machine possesses certain advantages as to simplicity of construction and certainty of operation, and moreover can be used to cut soles from a strip or sheet of material containing sufficient stock for a number of soles, as well as to cut a sole from a piece of material containing only enough stock for a single sole, it is to be understood that broadly considered certain features of my invention are not limited to this type of machine but may be embodied in a machine in which the relative movement of the pattern and knife is produced by moving the pattern. It is also to be understood, that, except as specifically recited in the claims, the various features of my invention are not limited to any particular construction or arrangement of parts.

In the machine shown in the Julian patents above referred to, means are provided for moving the knife carrier during the rounding operation to change the direction of the thrust or pull on the knife while the knife is

passing around the ends of the pattern in order to prevent the knife from leaving the pattern at these points. In these machines, however, and in all other sole rounding machines with which I am familiar which comprise a stationary pattern and means for moving the knife around the pattern, the thrust or pull on the knife while the knife is passing along the sides of the pattern is maintained substantially in the same direction being substantially parallel to the longitudinal axis of the pattern. For this reason there is a tendency for the knife to leave the pattern when passing around the prominent portions of the pattern at the junction of the shank and forepart. In certain styles of soles the curve at the junction of the shank and forepart changes abruptly or the curves of the forepart and shank meet at an angle. In rounding such soles, difficulty has been experienced in causing the knife to follow the pattern while traveling along the side of the pattern and it has either been necessary to run the sole rounding machine at a slow rate of speed or to allow the knife to leave the pattern when passing over the prominent portions at the junction of the shank and forepart and trim the sole to the exact shape of the pattern at a subsequent operation.

The object of my invention is to provide a sole rounding machine in which the tendency of the knife to leave the pattern while passing around the prominent portions at the junction of the shank and forepart is decreased, whereby soles which present sharp curves or angles at the junction of the shank and forepart can be trimmed to the exact shape of the pattern without decreasing the speed of the machine.

With this object in view my invention contemplates providing a sole rounding machine comprising a pattern and a knife carrier movable about the pattern with means for moving the knife carrier while the knife is traveling along the side of the pattern to vary the direction of the thrust or pull on the knife to cause the knife to follow the curves or angles of the pattern.

The means which I have provided for moving the carrier to vary the direction of the thrust or pull on the knife as the knife is traveling along the side of the pattern are equally applicable to a sole rounding machine in which the relative movement of the pattern and knife to cause the knife to travel

around the pattern is produced by moving the pattern, and I therefore consider certain features of my invention to consist in the means hereinafter described and claimed, or
 5 their equivalents, for producing the desired movements of the knife carrier to vary the direction of the thrust or pull on the knife, whether such means are embodied in a machine in which the relative movement of the
 10 pattern and knife to cause the knife to travel around the pattern is produced by moving the knife or are embodied in a machine in which such relative movement is produced by moving the pattern.

15 My invention also consists in certain devices, combinations and arrangements of parts hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art from the following description.
 20

In order that my invention may be clearly understood, I have illustrated a preferred form thereof as embodied in the sole rounding machine disclosed in the patent to Julian
 25 No. 663,656, above referred to.

In the patented machine the knife carrier is pivotally mounted upon a support which is rotated to carry the knife around the pattern. The knife carrier has an inward and
 30 outward sliding movement with respect to its pivot and is swung upon its pivot and moved inwardly and outwardly during the rotation of the rotary support by means of a crank having a direct wrist connection with
 35 the carrier and being secured to a shaft mounted in the rotary support and rotating independently thereof. The oscillating movements imparted to the knife carrier by the crank are such that the direction of the
 40 thrust or pull on the knife is changed as the knife travels around the heel and toe of the pattern to cause the knife to follow the sharp curves at these portions of the pattern. While the knife is traveling along the sides of
 45 the pattern the oscillating movements imparted to the knife carrier by the crank maintain the thrust or pull on the knife in a direction substantially parallel with the longitudinal axis of the pattern.

50 In order to vary the direction of the thrust or pull on the knife as the knife is traveling along the sides of the pattern so as to decrease the tendency of the knife to leave the pattern while passing around the prominent
 55 portions of the pattern at the junction of the shank and forepart and thereby enable the machine to trim soles which present sharp curves or angles at such points, I have provided means for imparting additional move-
 60 ments to the knife carrier. In the illustrated embodiment of my invention these additional movements are imparted to the knife carrier by moving the pivot of the carrier while the knife is traveling along the
 65 sides of the pattern. To enable the pivot of

the carrier to be moved, I have mounted it upon an arm supported from the rotary support and for moving the pivot of the knife carrier I have provided a cam and suitable
 70 connections between the cam and the arm upon which the pivot is mounted. The cam in the machine illustrated is stationary and the connections between the cam and the arm upon which the pivot of the knife carrier is mounted consist of a lever pivotally
 75 mounted upon the rotary support having one end in engagement with the cam and the other end connected to the arm by means of a link. The shape of the stationary cam and the arrangement of the connections are such
 80 that the knife carrier is oscillated about the wrist connection with the crank to change the direction of the thrust or pull on the knife as the knife passes around the sharp curves or angles at the junction of the shank
 85 and forepart of the pattern so as to overcome any tendency of the knife to leave the pattern at these points. The connections between the stationary cam and the pivot of the knife carrier are adjustable so that the
 90 requisite amount of movement can be imparted to the knife carrier to suit the shape of the sole which is to be trimmed.

Referring to the drawings accompanying this application in which like reference characters designate like parts throughout the
 95 several views, Figure 1 is a view in side elevation of so much of a sole rounding machine similar to the machine disclosed in the patent to Julian No. 663,656 as is necessary to
 100 show the connection of my invention therewith; Fig. 2 is a plan view of so much of the machine as is illustrated in Fig. 1; Fig. 3 is a plan view similar to Fig. 2 with the knife carrier removed, the standard upon which the
 105 pattern is supported being shown in section and a portion of the rotary support being broken away to show underlying parts, and Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.
 110

1 indicates a standard secured upon the base portion or column of the machine. Resting upon the upper end of the standard 1 and secured thereto is a standard 2 upon
 115 which the stationary pattern 3 is supported. Upon the upper cylindrical portion of the standard 1 a rotary support or table 4 is mounted. This table is provided with a raised plane surface 5 upon which the knife
 120 carrier 6 is mounted to oscillate and to move inwardly and outwardly. The knife carrier is provided with a slot 7 in its under surface which is engaged by a pivotally mounted block 8 supported from the table 4 as will be
 125 hereinafter described. A short vertical shaft 9 is mounted in bearings in the table 4 and to its upper end is secured a crank 10. This crank is connected by means of a wrist pin to a block 11 adjustably secured to the knife
 130 carrier, the wrist pin being adjustably mount-

ed in a slot in the crank. To the lower end of the shaft 9 a pinion 12 is secured which meshes with a pinion 13 rotatably mounted upon the table 4 and in turn meshing with a stationary gear 14 mounted upon the standard 1. The rounding knife is indicated at 15 and is mounted upon the inner end of an arm 16 secured to a segmental plate 17 pivotally mounted at 18 upon the knife carrier. The segmental plate 17 is provided with a series of gear teeth which mesh with a spring-pressed pinion upon a short vertical shaft 19, the construction being such that the segmental plate 17 is forced by the spring in a direction to hold the rounding knife against the pattern. To the upper end of the shaft 19 a hand lever 20 is secured by means of which the shaft and the pinion secured thereto may be rotated in a direction to withdraw the knife from contact with the pattern. A pawl 21 is mounted upon the lever 20 in such a position that it can be turned into engagement with a series of stationary ratchet teeth 22^a in order to lock the rounding knife in its retracted position.

The construction so far described is substantially the same as that disclosed in the patent to Julian No. 663,656 above referred to, reference to which may be had for further description and illustration thereof. In the machine shown in the patent, the pivot of the knife carrier is fixed with relation to the rotary support. During the revolution of the rotary support to carry the rounding knife around the pattern the knife carrier is oscillated by the rotation of the crank and moved inwardly and outwardly, the inward and outward movements maintaining the pressure of the knife upon the edge of the pattern more uniform than in the machine disclosed in the patent to Julian No. 528,128 above referred to, and the oscillating movements changing the direction of the thrust or pull on the knife as the knife passes around the heel and toe of the pattern so as to decrease the tendency of the knife to leave the pattern at these points and maintaining the thrust or pull on the knife while passing along the sides of the pattern substantially parallel with the longitudinal axis of the pattern.

In the machine shown in the drawings the pivot block 8 of the carrier instead of being fixed on the rotary support is mounted so as to be capable of being moved with relation thereto. To this end it is supported upon the outer end of an arm 22 being held in position thereon by means of a bolt 23. The inner end of the arm 22 is pivotally mounted upon the shaft 9 between the upper and lower bearings for the shaft and the outer end of the arm extends upwardly through a segmental slot in the table 4. By moving the arm 22 at the proper times during the revolution of the rotary support the knife carrier

can be swung about the wrist connection with the crank 10 as a pivot to so change the direction of the thrust or pull on the knife as to prevent the knife leaving the pattern in passing around the sharp curves or angles at the junction of the forepart and shank of the pattern. For so moving the arm 22 a stationary cam 24 and suitable connections between the cam and the arm 22 are provided. The cam 24 is mounted upon the standard 1 and rigidly secured thereto. The connections between the cam and the arm 22 consists of a lever 25 pivotally mounted on the rotary support and a link 26 connecting one arm of the lever to the arm 22. The other end of the lever 25 is provided with a cam roll or stud which engages the groove of cam 24. The pivot pin which connects the link 26 to the lever 25 passes through the end of the link and through a segmental slot in the lever 25, the construction being such that the pivot pin can be adjusted in the slot to vary the extent of the movements imparted to the arm 22 and to the pivot block 8 mounted thereon. The shape of the cam 24 is such that during the rotation of the table 4 in the direction indicated by the arrow the pivot block 8 is moved as the knife approaches the point *a* of the pattern in passing from the heel to the toe of the pattern so as to swing the knife carrier about the wrist connection with the crank 10 in a direction to bring the thrust or pull on the knife substantially tangential to the curve of the pattern and as the knife passes around the point *a* the pivot block 8 is moved in the opposite direction to bring the thrust or pull on the knife substantially tangential to the curve of the forepart of the pattern so that the knife passes around the point *a* without any liability of leaving the pattern. While the knife is passing around the heel and toe of the pattern the pivot block 8 is held stationary, the operation of the machine in trimming the heel and toe portions of the sole being the same as that of the machine disclosed in Patent No. 663,656 above referred to. As the rounding knife reaches the point *b* of the pattern in passing along the side of the pattern from the toe to the heel the pivot block 8 is again moved to swing the knife carrier in a direction to bring the thrust or pull on the knife substantially tangential to the curve of the shank portion and is then returned to normal position. By adjusting the pivot pin of the link 26 in the slot of the lever 25 the extent of the swinging movements imparted to the carrier can be varied to suit the shape of the sole to be trimmed. The knife carrier is held upon the table 4 by means of the wrist connection with the crank 10 and by the circular disk which forms the head of the bolt 23 which secures the pivot block 8 to the arm 22, the edge of the circular disk being received in an undercut portion of the

groove 7 in the under side of the knife carrier. The knife carrier is also held down upon the table 4 by means of a guiding flange or plate 27 extending from the knife carrier beneath the guide plate 28 secured to the table.

Having thus indicated the nature and scope of my invention and having specifically described a machine embodying a preferred form thereof, I claim as new and desirable to secure by Letters Patent.

1. A rounding machine, having, in combination, a pattern, a knife carrier movable about the pattern, a knife mounted thereon, means for pressing the knife towards the pattern and means for changing the angular position of the knife carrier while the knife is traveling along the side of the pattern to vary the direction of the inward and outward movements of the knife to cause the knife to follow the angles or curves of the pattern, substantially as described.

2. A sole rounding machine, having, in combination, a pattern, a rotary support, a knife carrier pivotally mounted upon said support, and means for oscillating the carrier and for moving the pivot of the carrier during the rotation of said support, substantially as described.

3. A sole rounding machine, having, in combination, a pattern, a rotary support, a knife carrier pivotally mounted upon said support, means for oscillating the carrier during the rotation of said support, and a cam and intermediate connections for moving the pivot of the carrier, substantially as described.

4. A sole rounding machine, having, in combination, a pattern, and a knife carrier relatively movable to carry the knife around the pattern, a knife mounted thereon, means for pressing the knife towards the pattern, means for moving the knife carrier during the relative movement of the knife carrier and pattern to change the angular position of the knife carrier while the knife is passing around the ends of the pattern, and means for imparting additional movements to the knife carrier to change the angular position of the knife carrier while the knife is traveling along the side of the pattern, substantially as described.

5. A sole rounding machine, having, in combination, a pattern, a knife carrier movable about the pattern, means for oscillating the knife carrier during such movement, and means for moving the pivot of the knife carrier, substantially as described.

6. A sole rounding machine, having, in combination, a pattern and a knife carrier relatively movable to carry the knife around the pattern, means for oscillating the knife carrier during such movement, and means for moving the pivot of the carrier, substantially as described.

7. A sole rounding machine, having, in combination, a pattern and a knife carrier relatively movable to carry the knife around the pattern, a crank and intermediate connections for moving the carrier to change its angular position during such relative movement, and means for imparting additional movements to the carrier to change its angular position, substantially as described.

8. A sole rounding machine, having, in combination, a pattern and a knife carrier relatively movable to carry the knife around the pattern, a crank and intermediate connections for moving the carrier during such relative movement, and a cam and intermediate connections for imparting additional movements to the carrier, substantially as described.

9. A sole rounding machine, having, in combination, a pattern and a pivotally mounted knife carrier relatively movable to carry the knife around the pattern, said carrier being slidably mounted with respect to its pivot, a crank and a direct wrist connection between the crank and the carrier for moving the carrier during the relative movement of the carrier and pattern, and means for moving the pivot of the carrier, substantially as described.

10. A sole rounding machine, having, in combination, a pattern, a rotary support, a knife carrier pivotally mounted upon said support, said carrier being slidably mounted with respect to its pivot, a crank mounted on the rotary support and a direct wrist connection between the crank and the carrier for moving the carrier during the rotation of the support, and means for moving the pivot of the carrier, substantially as described.

11. A sole rounding machine, having, in combination, a pattern, a rotary support, a knife carrier pivotally mounted upon said support, said carrier being slidably mounted with respect to its pivot, a crank mounted on the rotary support and a direct wrist connection between the crank and the carrier for moving the carrier during the rotation of the support, and a stationary cam and intermediate connections for moving the pivot of the carrier, substantially as described.

12. A sole rounding machine, having, in combination, a pattern and a pivotally mounted knife carrier relatively movable to carry the knife around the pattern, and means for oscillating the knife carrier and for imparting additional movements thereto, to change the angular position of the knife carrier during the rounding operation substantially as described.

13. A sole rounding machine, having, in combination, a pattern and a knife carrier relatively movable to carry the knife around the pattern, means for controlling the position of the knife carrier while the knife is

passing around the ends of the pattern, and additional means for controlling the position of the knife carrier while the knife is passing along the sides of the pattern, substantially as described.

14. A rounding machine, having, in combination, a pattern and a support mounted for relative rotary movement, a knife carrier mounted on said support, a rounding knife movably mounted on said carrier, means for pressing the knife towards the pattern, and means for changing the position of the knife carrier while the knife is acting along the side of the pattern to vary the direction of the inward and outward movements of the knife to cause the knife to follow the curves or angles of the pattern at the junction of the shank and forepart, substantially as described.

15. A rounding machine, having, in combination, a pattern and a support mounted for relative rotary movement, a knife carrier mounted on said support, means for imparting inward and outward movements to the knife carrier during the relative rotary movement of the pattern and support, and means for changing the angular position of the knife carrier on said support while the knife is acting along the side of the pattern to cause the knife to follow the curves or angles of the pattern, substantially as described.

16. A rounding machine, having, in combination, a pattern, a knife carrier, a rounding knife mounted on the carrier, means for moving the knife carrier to cause the knife to travel around the pattern in a path approximating in shape that of the pattern, and means for changing the angular position of the knife carrier on said support while the knife is traveling along the side of the pattern to cause the knife to follow the curves or angles of the pattern, substantially as described.

17. A sole rounding machine, having, in combination, a pattern and a knife carrier relatively movable to carry the knife around the pattern, a knife mounted on said carrier, means for pressing the knife towards the pattern, and means for changing the angular position of the knife carrier while the knife is traveling along the side of the pattern to vary the direction of the inward and outward movements of the knife to cause the knife to follow the angles or curves of the pattern at the junction of the shank and forepart, substantially as described.

18. A sole rounding machine, having, in combination, a pattern, a rotary support, a carrier pivotally mounted thereon, a rounding knife mounted on the carrier, a cam for oscillating the carrier and connections between the cam and carrier acting to transmit substantially the entire force exerted by

the cam to the carrier in a direction substantially at right angles to a line joining the point about which the carrier oscillates and the point at which the force is applied, substantially as described.

19. A sole rounding machine, having, in combination, a pattern, a rotary support, a carrier pivotally mounted thereon, a rounding knife mounted on the carrier, a cam for oscillating the carrier, a lever pivotally mounted upon the rotary support, and connections between the lever and the cam, and between the lever and the carrier, substantially as described.

20. A sole rounding machine, having, in combination, a pattern, a rotary support, a carrier pivotally mounted thereon, a rounding knife mounted on the carrier, a cam for oscillating the carrier, and mechanism intermediate the cam and carrier mounted upon the rotary support and acting to transmit substantially the entire force exerted by the cam to the carrier in a direction substantially at right angles to a line joining the point about which the carrier oscillates and the point at which the force is applied, substantially as described.

21. A sole rounding machine, having, in combination, a pattern, a rotary support, a carrier pivotally mounted thereon, a rounding knife mounted on the carrier, and means for oscillating the carrier comprising a cam and mechanism intermediate the cam and the carrier mounted on the rotary support, substantially as described.

22. A sole rounding machine, having, in combination, a knife carrier and a pattern mounted for relative movement and a cam for moving the carrier during such relative movement to change its angular position, substantially as described.

23. A sole rounding machine, having, in combination, a pattern, a rotary support, a knife carrier pivotally mounted thereon, a cam and mechanism comprising connections movable with relation to the carrier and actuated by the cam for oscillating the carrier during the rounding operation, substantially as described.

24. A sole rounding machine, having, in combination, a pattern, a rotary support, a knife carrier mounted thereon, a cam and mechanism comprising connections movable with relation to the carrier and actuated by the cam for moving the carrier to change its angular position during the rounding operation, substantially as described.

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

CHARLES L. ALLEN.

Witnesses:

NELSON W. HOWARD,

BERTHA LOUISE HANNAH.