

No. 865,249.

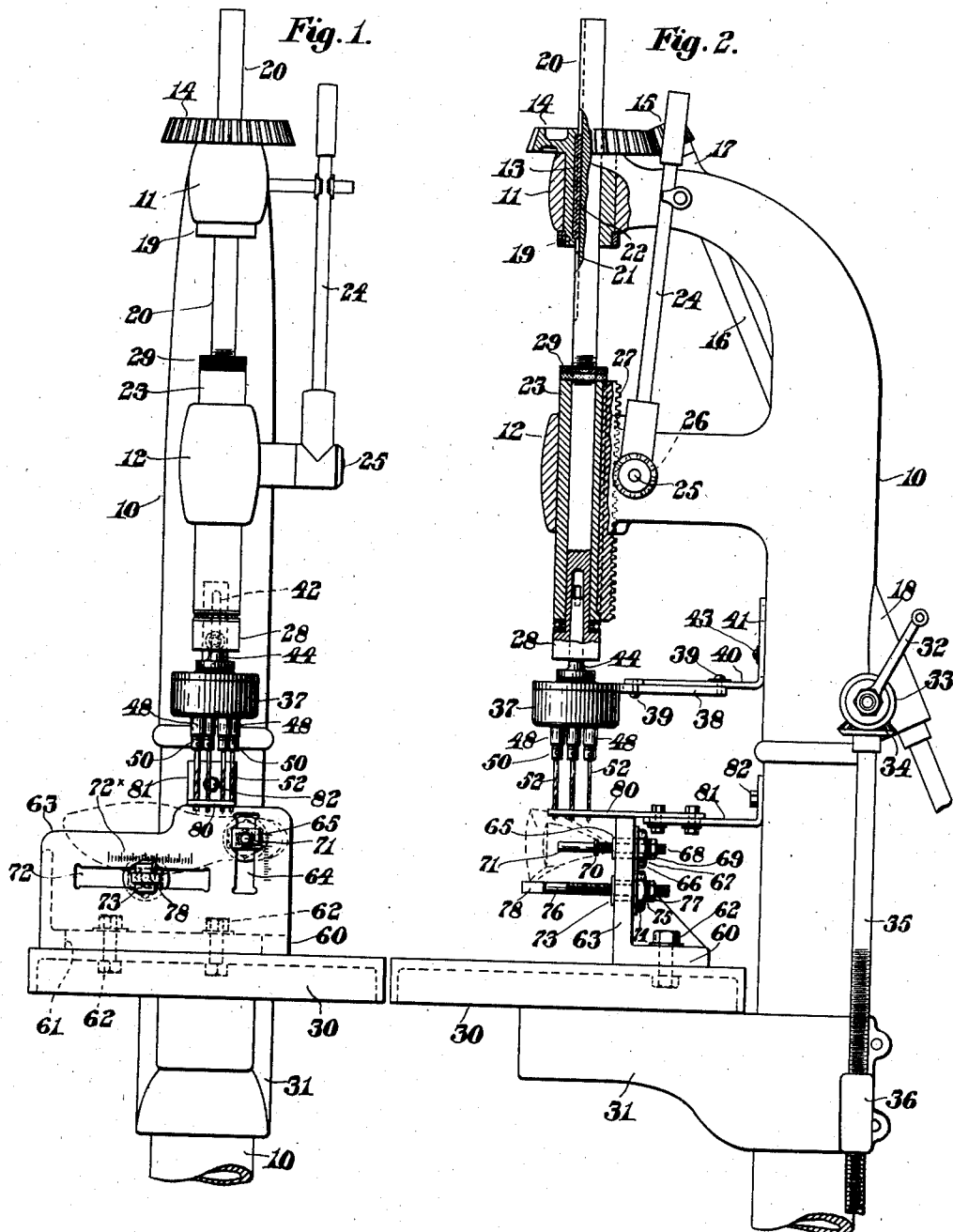
H. J. JAQUITH.

PATENTED SEPT. 3, 1907.

MULTIPLE DRILL ATTACHMENT FOR DRILLING MACHINES.

APPLICATION FILED DEC. 17, 1906.

3 SHEETS—SHEET 1.



Witnesses:

Herbert A. Hall
Nathan C. Lombard

Inventor:

Harry J. Jaquith,
by Walter E. Lombard,
Atty.

No. 865,249.

H. J. JAQUITH.

PATENTED SEPT. 3, 1907.

MULTIPLE DRILL ATTACHMENT FOR DRILLING MACHINES.

APPLICATION FILED DEC. 17, 1906.

3 SHEETS—SHEET 2.

Fig. 3.

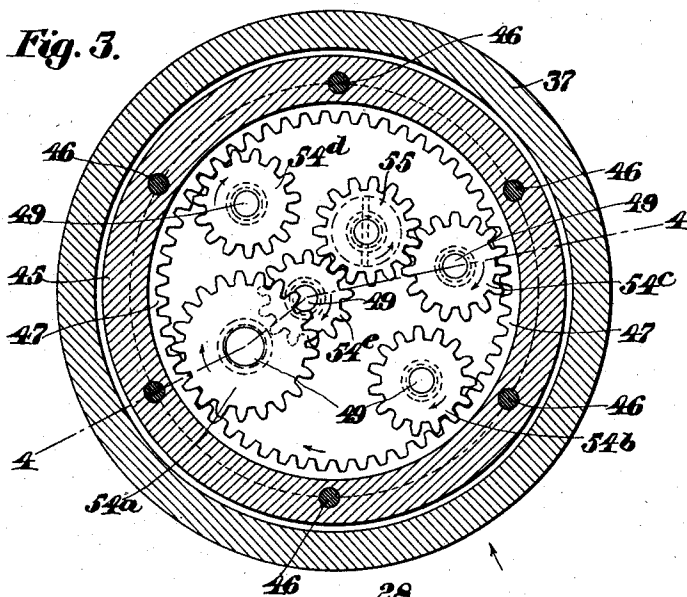
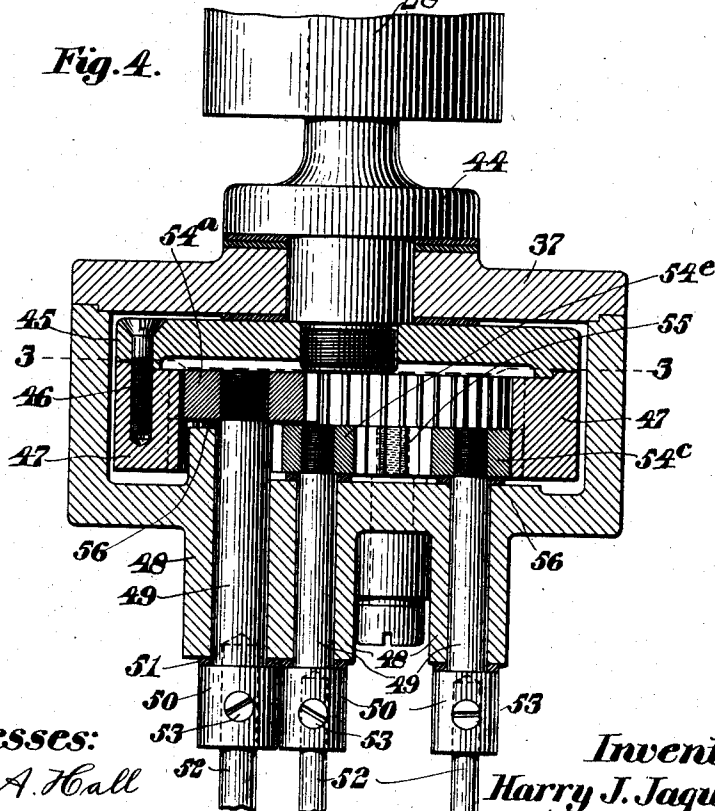


Fig. 4.



Witnesses:

Herbert A. Hall
Nathan C. Lombard

Inventor:

Harry J. Jaquith,
by Hatter E. Lombard,
Atty.

No. 865,249.

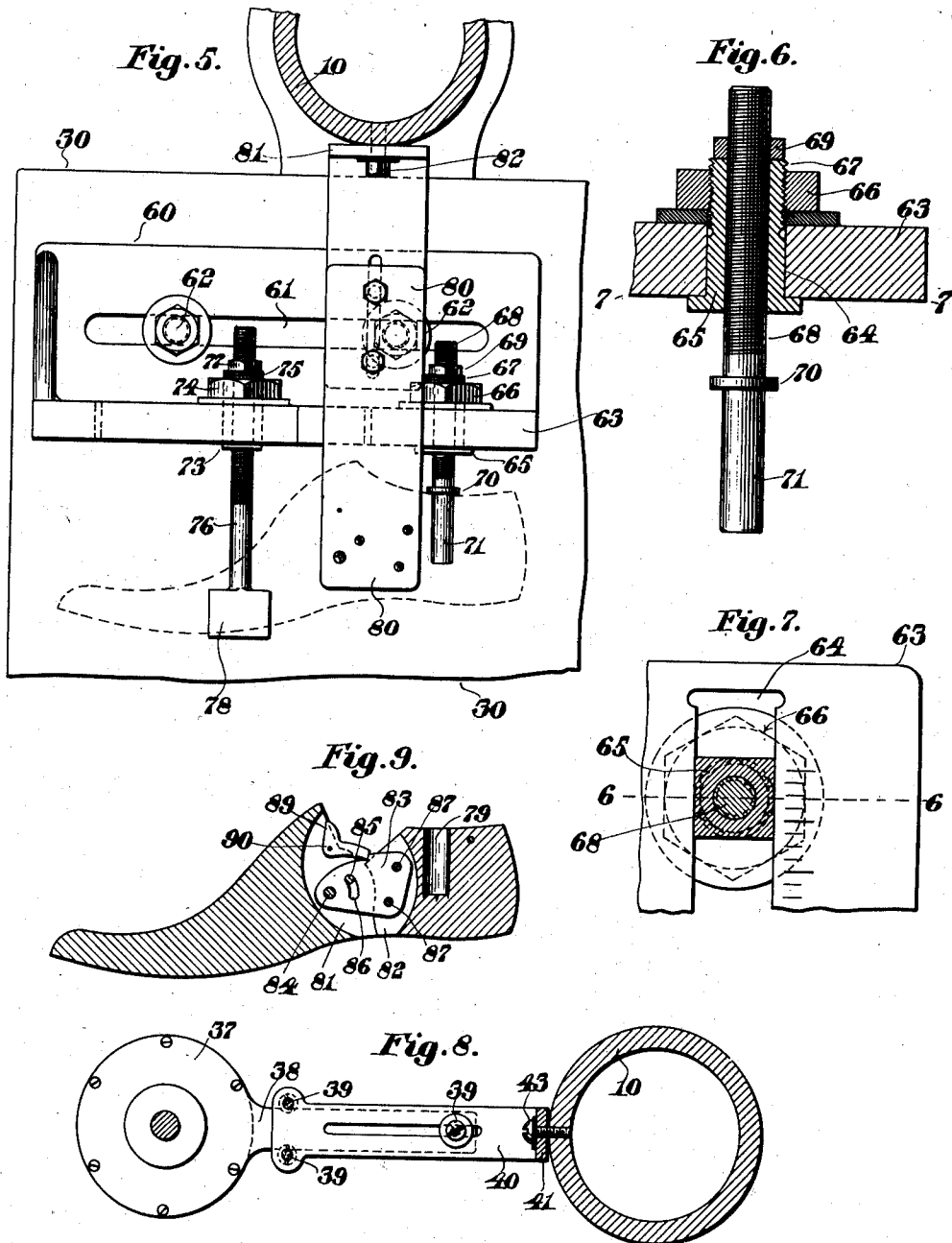
H. J. JAQUITH.

PATENTED SEPT. 3, 1907.

MULTIPLE DRILL ATTACHMENT FOR DRILLING MACHINES.

APPLICATION FILED DEC. 17, 1906.

3 SHEETS—SHEET 3.



Witnesses:
Herbert A. Hall
Nathan C. Lombard

Inventor:
Harry J. Jaquith,
by Walter E. Lombard,
Atty.

UNITED STATES PATENT OFFICE.

HARRY J. JAQUITH, OF BOSTON, MASSACHUSETTS.

MULTIPLE-DRILL ATTACHMENT FOR DRILLING-MACHINES.

No. 865,249.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed December 17, 1906. Serial No. 348,153.

To all whom it may concern:

Be it known that I, HARRY J. JAQUITH, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Multiple-Drill Attachments for Drilling-Machines, of which the following is a specification.

This invention relates to multiple drilling machines and has for its object the production of an apparatus for simultaneously drilling a plurality of holes through a last intended subsequently to be divided and hinged together, said holes being adapted to receive pins to secure in position the connector between the heel and toe portion of said last.

The invention consists primarily in an attachment to be applied to the chuck of any ordinary drilling machine, the casing or support for which is provided with means to prevent rotary motion thereof and is also provided with a plurality of revoluble drill holding members supported by said casing and mechanism interposed between said members and the chuck of the drilling machine whereby the rotation of the latter causes a simultaneous rotation of the revoluble drill holding members.

One feature of the invention consists in a suitable fixed guide to prevent the spread of the plurality of drills when in operation while an adjustable support adapted to hold the last while being operated upon forms another important feature.

The invention further consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims hereinafter given.

Of the drawings: Figure 1 represents a front elevation of a portion of a drilling machine with the improvements embodying the subject-matter of the present application applied thereto. Fig. 2 represents a side elevation of the same. Fig. 3 represents a horizontal section through the multiple drill attachment on line 3—3 on Fig. 4. Fig. 4 represents a transverse vertical section on line 4—4 on Fig. 3. Fig. 5 represents a section through a portion of the column of the drilling machine showing in plan a portion of the supporting table and the adjustable last support mounted thereon. Fig. 6 represents a horizontal section through the last support the cutting plane being on line 6—6 on Fig. 7. Fig. 7 represents a vertical section of the same on line 7—7 on Fig. 6. Fig. 8 represents a section through the supporting column of the drilling machine showing in plan the multiple drill attachment and adjustable connector to prevent the rotation of the casing thereof, and Fig. 9 represents a section through a two-part hinged last showing the means of connecting and locking the heel and toe portions together and the location of the holding pins extending transversely through said last and the connecting devices.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings 10 represents the column of a drilling machine of any well-known construction provided with bearings 11 and 12. The bearing 11 supports the hub 13 of a revoluble bevel gear 14 driven by a pinion 15 on the end of a shaft 16 revoluble by any suitable means in suitable bearings 17 and 18 forming a part of the column 10. The hub 13 is prevented from moving longitudinally of its bearing by means of the collar 19 secured thereto. Extending through the hub 13 is a spindle 20 provided with a spline 21 into which projects a key 22 fixed to the hub 13 so that the spindle 20 is permitted to move longitudinally of said hub 13 but is prevented from any rotative movement independent thereof. The spindle 20 extends through a vertically movable sleeve 23 supported in the bearing 12 in which it is adapted to be vertically reciprocated by means of the handle 24 secured to a shaft 25 on the inner end of which is secured a pinion 26 meshing with the rack 27 formed upon said sleeve 23.

The extreme lower end of the spindle 20 is provided with a suitable chuck 28 adapted to rotate with said spindle. The chuck 28 and the adjustable collars 29 threaded to the spindle 20 prevent said spindle from being moved longitudinally of the sleeve 23 while free rotation therein is permitted.

Beneath the chuck 28 is a table 30 mounted upon a suitable arm 31 adapted for vertical movement along the column 10 by means of the handle 32 driving through the gears 33 and 34 the revoluble shaft 35 threaded to the nut 36 on the vertically movable member 31. All of the parts heretofore described are old and may be varied to suit different conditions, it being perfectly obvious that the essential features to be provided are a suitable work supporting table and a revoluble chuck together with means for reciprocating one of these elements toward and from the other at the will of the operator.

The present invention consists primarily in providing an attachment which will carry a plurality of revoluble drills operable by the rotation of the chuck 28. To carry out this invention, a casing 37 is provided having a rearwardly extending arm 38 to which is adjustably connected by means of the screws 39 a member 40, the rear end of which is bent upwardly as at 41 and is provided with a slot 42 through which extends a screw 43 threaded to the column 10.

Extending through the upper wall of the casing 37 is a spindle 44 adapted to be held by the chuck 28 and rotated therewith. Secured to the lower end of the spindle 44 by means of a lefthand thread is the revoluble member 45 to which is secured by means of the screws 46 an annular gear 47 adapted to be rotated within the casing 37 by means of the rotation of the chuck 28.

The lower wall of the casing 37 is provided with a plu-

rality of bosses 48 in each of which is mounted a revoluble member 49 having at its lower end an enlargement 50 having interposed between the upper shoulder of which and the lower face of the boss 48 a suitable fiber washer 51. The lower end of each of the revoluble members 49—50 is provided with a socket in which a drill 52 is adapted to be inserted and secured in position by means of the set screw 53.

On the upper end of each of the revoluble members 49 is secured, respectively, a pinion 54^a, 54^b, 54^c, 54^d, and 54^e. One of the revoluble members 49 extends further into the interior of the casing than the other members and the pinion 54^a secured to its upper end meshes with the upper portion of the teeth of said annular gear 47. The pinions 54^b, 54^c, and 54^d are each located in a lower plane and engage and mesh with the lower half of the teeth of said annular gear 47.

The pinion 54^e is so located that it is necessary to provide an idler gear 55 interposed between said pinion and the pinion 54^c by which the pinion 54^e is driven in the same direction as the other pinions mounted upon the upper ends of the revoluble members 49. Interposed between each of the pinions 54 and the inner face of the lower wall of the casing 37 is a fiber washer 56. It is obvious that when the chuck 28 is revolved the spindle 44 held thereby will be rotated therewith and cause the member 45 and the annular gear 47 to be likewise rotated thus insuring a revolution through the pinions 54 of each of the revoluble members 49 and the consequent rotation of the drills 52 held thereby.

On the table 30 is adjustably secured a member 60 provided with a longitudinal slot 61 through which the clamp screws 62 extend into the table 30. It is obvious that by loosening the clamp screws 62 this member may be adjusted longitudinally of the slot 61 in either direction and again clamped in adjusted position.

The member 60 is provided with a vertical wall 63 which is provided at one end with a vertical slot 64 in which is mounted a block 65 adapted to be adjustable vertically in said slot 64 and clamped in position by the nut 66 threaded to a rearwardly extending threaded hub 67. Threaded to the interior of said block 65 is a rod 68 adapted to be adjusted longitudinally therein and locked in adjusted position by means of the nut 69 bearing against the outer face of the threaded hub 67. This threaded rod is provided with a collar 70 which forms a guide for the last, the outer portion 71 of said rod being of a diameter adapted to fit the jack socket of a last.

The vertical wall 63 of the adjustable member 60 is provided with another slot 72 at right angles to the slot 64 and has mounted therein a block 73 adapted for horizontal adjustment in the horizontal slot of said wall and clamped in adjusted position by means of the nut 74 threaded to the rearwardly extending threaded shank 75 thereof.

Threaded to the block 73 is a threaded spindle 76 said spindle being adapted to be adjusted through said block 73 and locked in adjusted position by means of the nut 77 threaded to its rear end. The front end of the spindle 76 is provided with a suitable pad 78 adapted to support the toe portion of the last. On the vertical wall 63 adjacent to the horizontal slot 72 is a scale 72* by which the position of said block 73 may be regulated for various sizes of lasts.

The present invention is used in the manufacture of lasts as follows. As soon as the last comes from the lathe it is taken to a drilling machine and the jack socket 79 is drilled therein. The last is then taken to a machine embodying the features of the present invention and the last is placed upon an adjustable last support with the shank 71 extending into the socket 79 and the toe portion of the last is placed upon the pad 78. The collar 70 limits the movement of the last to the rear while the shank 71 fits the socket 79 so as to prevent any horizontal inclination thereof. The block 65 is adjusted vertically in the slot 64 to cause the drills when operating upon a last to pass through the same in a direction at right angles to the center of the last. The pad 78 may be adjusted longitudinally of the member 60 for different sizes of lasts and may be adjusted outwardly from the vertical wall 63 to accommodate itself to various shapes of lasts. Resting upon the upper edge of the vertical wall 63 is a plate 80 adjustably secured to an arm 81 bolted at 82 to the column 10. The outer end of the plate 80 is provided with a plurality of openings extending there-through located in axial alinement with the axis of the revoluble members 49. The drills 52 extend through the openings in said plate 80 for the purpose of preventing the drills from spreading when they first contact with the inclined or curved sides of the last. When the holes have been bored through the last the last is then sawed in two in the usual manner as shown in Fig. 9 and slots 81—82 are cut in the toe and heel portions. The hinge plate 83 is then inserted in these slots. The hinge pin 84 is driven through one of the openings in the toe portion and through the plate 83. The pin 85 is driven through another of the openings in the toe portion and through the slot 86 in said plate and the securing pins 87 are driven through the two openings in the heel portion and the corresponding openings in the hinge plate. The lock 89 is then secured in position by means of the pin 90 extending through the same and through the holes drilled therefor in the upper part of the toe portion.

While the apparatus is shown primarily adapted for use in drilling a plurality of holes simultaneously through a last it is obvious that it is equally adapted for use for a variety of other purposes and upon other articles.

It is believed that the operation of the invention will be thoroughly understood from the foregoing description and that the many advantages in an apparatus of this kind whereby an irregular object, such as a last may be held in any desired position during the operation of drilling therethrough a plurality of holes are fully apparent.

Having thus described my invention, I claim:

1. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a member adjustable transversely thereof beneath said drills; and a horizontally projecting work support thereon.
2. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a member adjustable transversely thereof beneath said drills; and a work supporting pin thereon adapted to enter the socket of a last and adjustable at right angles to said member.
3. The combination with a revoluble chuck adapted for

endwise movement; of a plurality of drills operated thereby; a table; a member adjustable transversely thereof beneath said drills; and a shouldered work supporting pin thereon adjustable at right angles to said member.

5 4. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; and a work supporting pin adjustable toward and from said table and adapted to enter the socket of a last to position it during the operation of drilling.

10 5. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a work supporting pin adjustable toward and from said table and adapted to enter the socket of a last to position it during the operation of drilling; and a rest
15 for the free end of said work.

6. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a work supporting pin adjustable toward and from said table and adapted to enter the socket of a last
20 to position it during the operation of drilling; and an adjustable rest for the free end of said work.

7. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a work supporting pin adjustable toward and from said table and adapted to enter the socket of a last
25 to position it during the operation of drilling; and a rest adjustably secured to said member and movable toward and from said work supporting pin.

8. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a member adjustable transversely of said table; a work supporting pin thereon adapted to enter the socket of a last; and an adjustable rest secured to said member adjustable to and from said work support and
30 also adjustable in a direction at right angles to said member. 35

9. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a member adjustable transversely of said table; a work supporting pin thereon adapted to enter the socket of a last and provided with an index; and a scale
40 on said member to register the position of said support.

10. The combination with a revoluble chuck adapted for endwise movement; of a plurality of drills operated thereby; a table; a member adjustable transversely of said table; a work supporting pin thereon adapted to enter the socket of a last and provided with an index; a scale on
45 said member to register the position of said support; an adjustable rest; and a scale on said member to register the position of said rest. 50

Signed by me at Boston, Mass., this 10th day of December, 1906.

HARRY J. JAQUITH.

Witnesses:

WALTER E. LOMBARD,
EDNA C. CLEVELAND.