F. L. ALLEY.

SKIVING MACHINE.

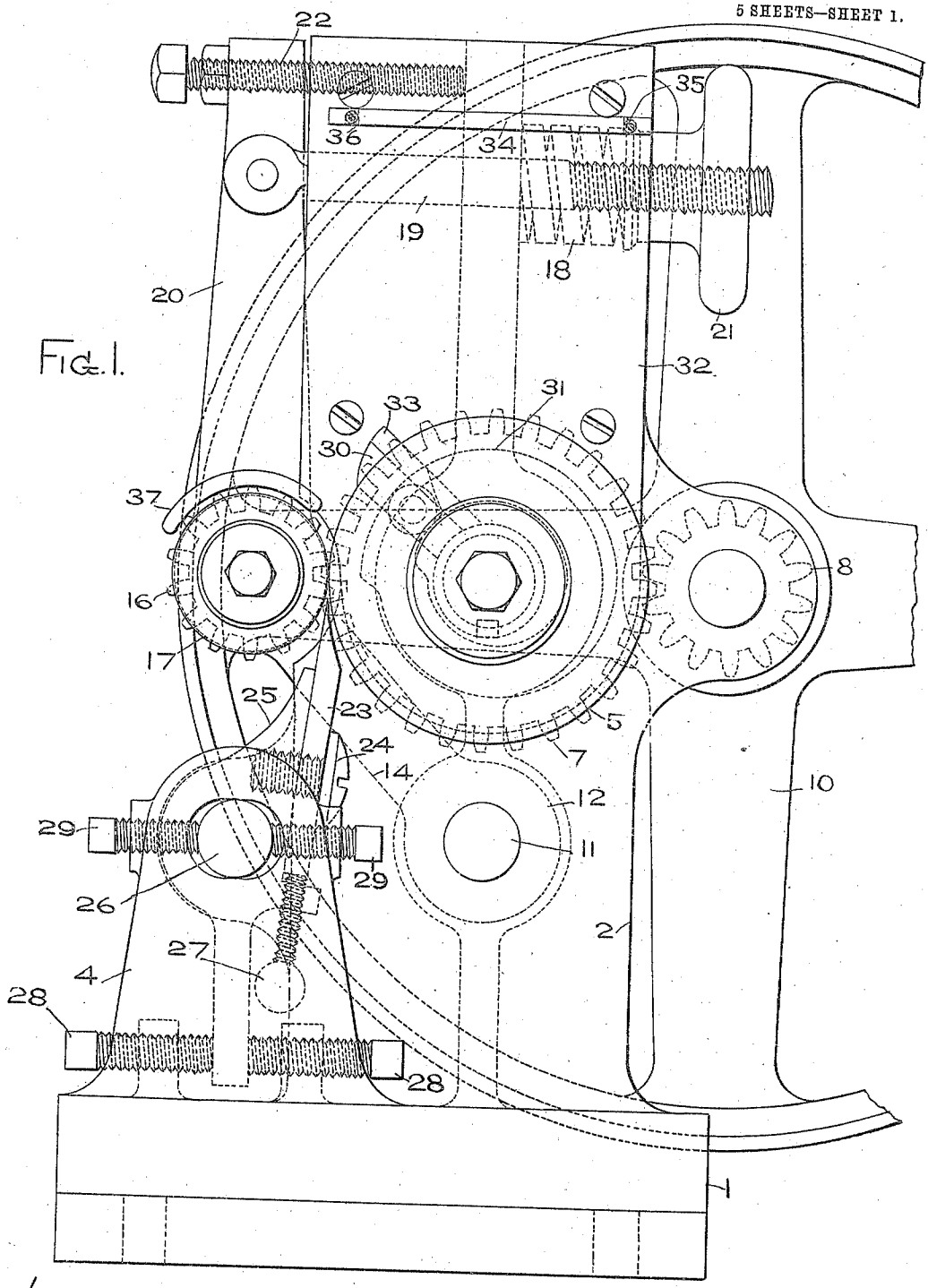
APPLICATION FILED FEB. 5, 1904.

948,032.

Patented Feb. 1, 1910.

5 SHEETS—SHEET 1.

FIG. 1.




WITNESSES

Edwin F. Samuels

Alfred H. Hildreth

INVENTOR

Frederick L. Alley

by his Attorneys

Phillips Van Buren Moore

F. L. ALLEY.

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5 SHEETS—SHEET 2.

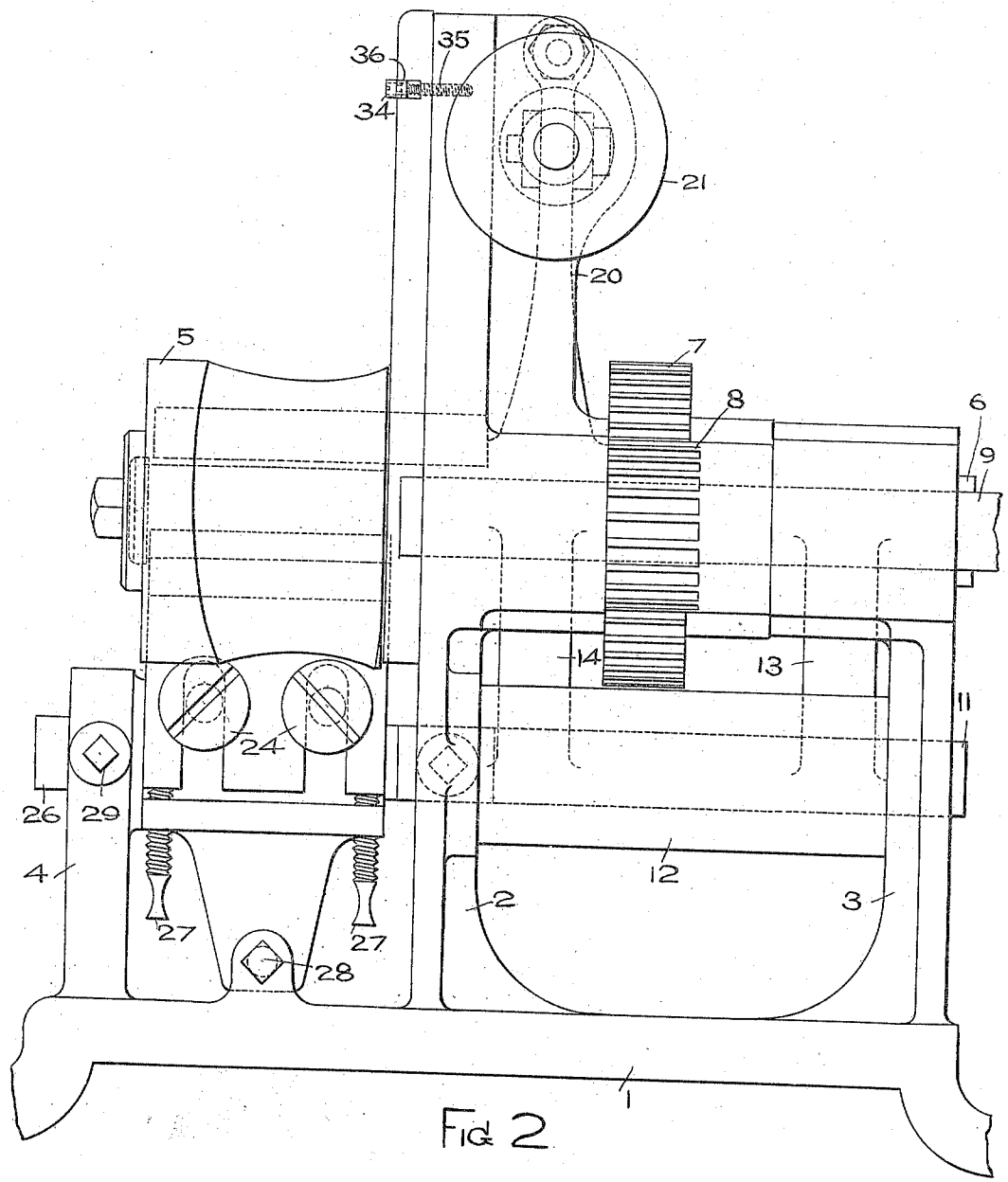


FIG 2

WITNESSES.

Edwin F. Sammuck

Alfred H. Hildreth

INVENTOR

Frederick L. Alley

by his Attorneys

Phillips Van Everen Dick

F. L. ALLEY.

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5 SHEETS—SHEET 3.

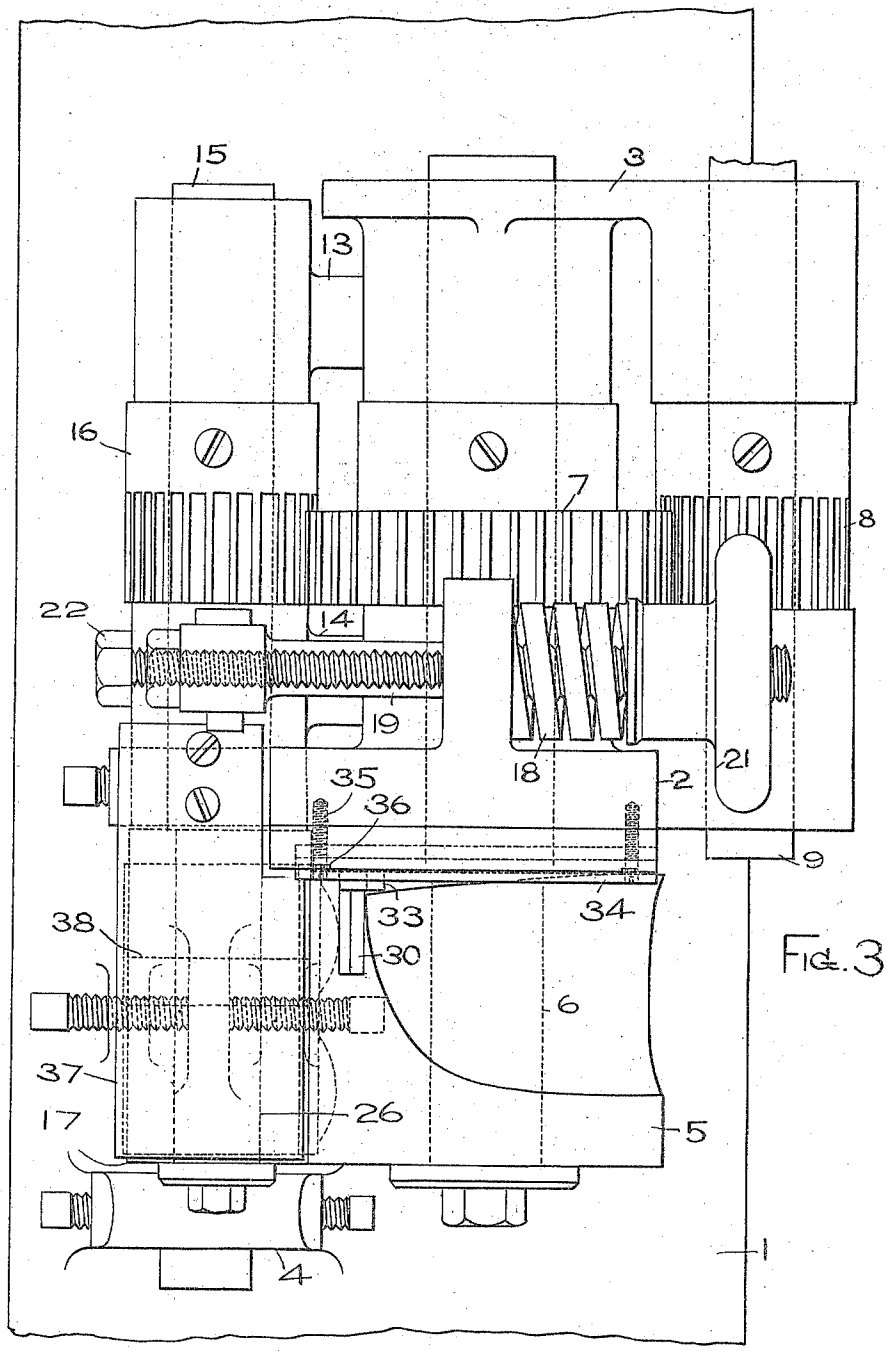


Fig. 3.

WITNESSES

Edwin T. Sammels

Alfred H. Hildreth

INVENTOR

Frederick L. Alley

by his Attorneys

Philipp Van Gunden Dick

F. L. ALLEY.
SKIVING MACHINE.
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5 SHEETS—SHEET 4.

Fig. 4.

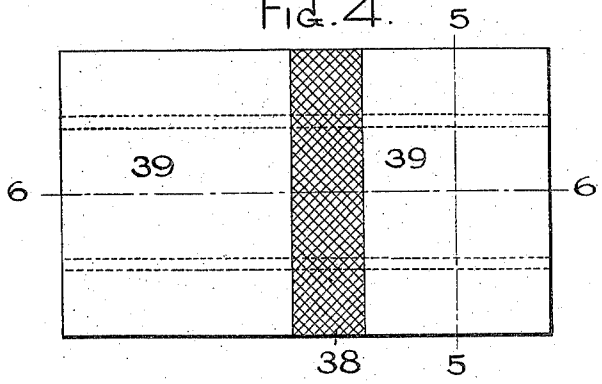



Fig. 5.

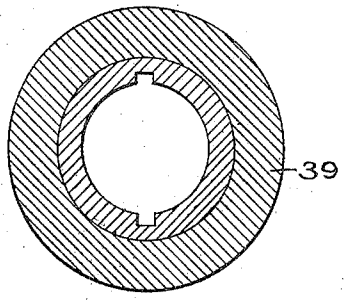
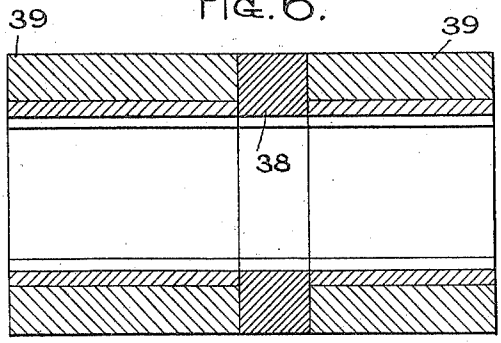



Fig. 6.




WITNESSES.
Edwin F. Saunds
Alfred H. Hildreth

INVENTOR
Frederick L. Alley
by his Attorneys
Phillips Van Everen & Fiok

F. L. ALLEY.

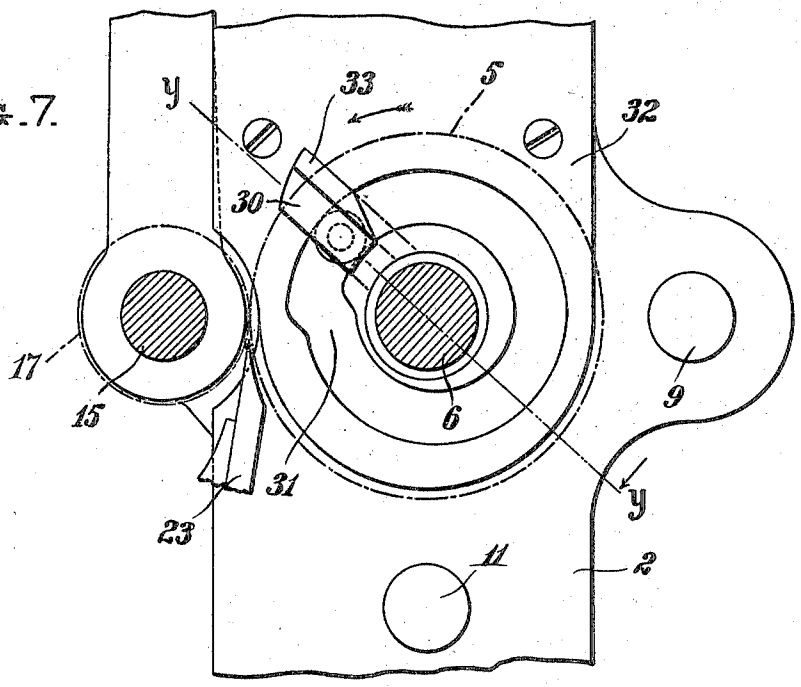
SKIVING MACHINE.

APPLICATION FILED FEB. 6, 1904.

948,032. Patented Feb. 1, 1910.

5 SHEETS—SHEET 5.

FIG. 7.



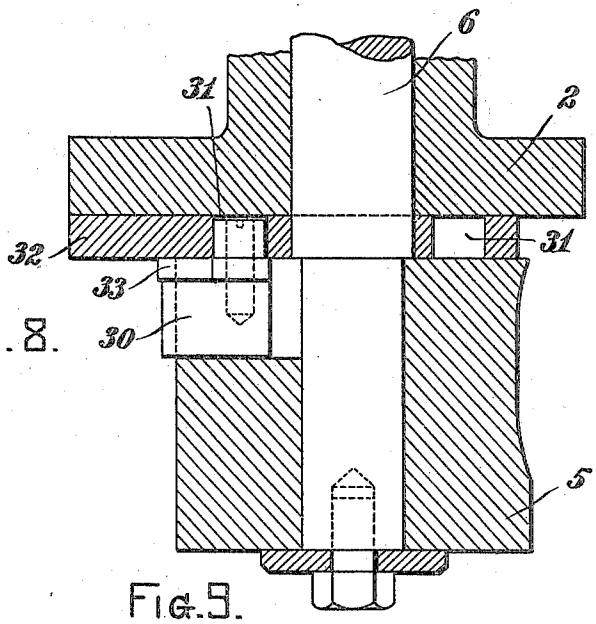
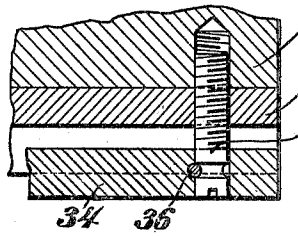




FIG. 8.

FIG. 9.




WITNESSES:

E. C. Wurdeman

N. D. McPhail

INVENTOR:

Frederick L. Alley

by his Attorneys

Phillips Van Orden & Fish

# UNITED STATES PATENT OFFICE.

FREDERICK L. ALLEY, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## SKIVING-MACHINE.

948,032. Specification of Letters Patent. Patented Feb. 1, 1910.

Application filed February 5, 1904, Serial No. 192,202.

*To all whom it may concern:*

Be it known that I, FREDERICK L. ALLEY, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Skiving-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 skiving machines and particularly to skiving machines which comprise a die in which a blank is held during the skiving operation by means of a pressure device, and which are adapted to skive counters, box toe pieces and similar articles.

In skiving machines of the class referred to, the pressure device which is now commonly used, consists of a pressure roll provided with a yielding covering of rubber. This roll is arranged to force the blank into the die and hold it therein while the blank is being fed against the skiving knife, and to also operate with the die in feeding the blank. The rubber covering of the roll is thus subjected to severe strains both by the embedding of the blank therein and by the circumferential displacement produced in feeding the blank, and rapidly becomes worn out so that frequent replacement of the roll is necessary.

One of the objects of the present invention is to produce a pressure roll which is adapted to coöperate with a die in as satisfactory a manner as a roll provided with a rubber covering, but which is not liable to the deterioration incident to a rubber covered roll, so that renewal or replacement of the roll is necessary only at long intervals.

Other objects of the invention are to improve and simplify the construction and arrangement of the various parts of skiving machines with a view to rendering such machines more compact and durable and more efficient in operation.

With these objects in view, a feature of the invention contemplates the provision of a pressure roll comprising a rigid portion of less width than the die with which the roll is to coöperate and a yielding portion on each side of the rigid portion. This roll is so arranged with relation to the die that the rigid portion bears upon the center of a blank passed between the die and pressure roll, while the yielding portions bear upon the edges of the blank. The rigid portion thus acts to force the blank into the die and seat it firmly against the bottom of the die, and also coöperates with the die in feeding the blank so that the greater part of the strain to which the pressure roll is subjected, is taken by the rigid portion of the roll. The yielding portions of the roll on each side of the rigid portion, allow the blank to bend longitudinally of the roll so that the blank is accurately fitted into the die and held in proper position to be skived by the skiving knife. The yielding action of the portions of the roll on each side of the rigid portion is preferably secured by providing these portions with yielding surfaces so that the roll is provided with a rigid surface of less width than the width of the die and with a yielding surface on each side of the rigid surface. In the preferred form of the invention hereinafter specifically described, the yielding surfaces on each side of the rigid portion of the roll are of rubber which allow the edges of the blank to be embedded therein when the blank is forced into the die.

In the machine in which the present invention has been embodied, the die is formed in a roll which rotates with the pressure roll. Machines of this type have been provided with an end gage mounted to move radially in the die roll. This end gage merely determines the position of the entering end of the blank with relation to the die, and a feature of the present invention contemplates providing a gage mounted to move radially in the die roll which not only determines the position of the end of the blank but also the position of the side of the blank with relation to the die. This gage consists of a radially movable end gage and a side gage mounted upon the end gage. By the use of this gage, the position of the blank can be accurately determined and no mechanism for moving the gage is required other than that which has heretofore been employed for moving the end gage. In connection with this end and side gage, a stationary edge

gage for the rear end of the blank is also preferably used, whereby the position of the entire blank with relation to the die is easily and accurately determined as the blank is fed into the machine by the operator.

Other features of the present invention consist in certain constructions and arrangements of parts hereinafter described and claimed which tend to simplify and improve the construction and operation of the machine and render it more compact and convenient of operation, the advantages of which constructions and arrangements will be obvious to those skilled in the art, from the following description.

The various features of the invention will be readily understood from an inspection of the accompanying drawings, in which—

Figure 1 is a view in front elevation of a counter skiving machine embodying the same in its preferred form. Fig. 2 is a view in side elevation of the machine illustrated in Fig. 1. Fig. 3 is a plan view. Fig. 4 is a view in side elevation of the pressure roll. Fig. 5 is a sectional view of the pressure roll taken on the line 5—5 of Fig. 4. Fig. 6 is a longitudinal sectional view of the pressure roll taken on the line 6—6 of Fig. 4. Fig. 7 is a detail view illustrating particularly the radially movable end gage and the mechanism for operating the same. Fig. 8 is a detail sectional view taken on the line *y—y* of Fig. 7, and Fig. 9 is a detail sectional view illustrating the manner in which the edge gage for the rear end of the blank is mounted and adjusted.

The frame of the machine illustrated in the drawings comprises a base 1, vertical standards 2 and 3 and a short vertical standard 4 at the front of the machine. The die roll is indicated at 5 and is secured upon the projecting front end of a shaft 6 journaled in bearings in the standards 2 and 3. Between the bearings a pinion 7 is secured to the shaft 6 and holds the shaft from moving longitudinally. The pinion 7 meshes with a pinion 8 secured to the driving shaft 9 journaled in bearings in the standards 2 and 3 at one side of the shaft 6 and in the same horizontal plane. Upon the rear end of the shaft 9 is secured a driving pulley 10, by which motion is imparted to the driving shaft and through the pinions 8 and 7 to the shaft 6 and die roll 5.

Directly beneath the die roll shaft and in the same vertical plane therewith, a shaft or rod 11 is mounted in the standards 2 and 3 and upon this shaft is pivotally mounted the frame in which the pressure roll shaft is journaled. This frame consists of a sleeve 12 mounted upon the shaft 11 and arms 13 and 14 projecting upwardly and laterally from the sleeve. The pressure roll shaft 15 is mounted in bearings in the upper ends of the arms 13 and 14 and is held from longitudinal movement by means of a pinion 16 secured to the shaft between the bearings. The pinion 16 meshes with the pinion 7 on the die roll shaft so that the pressure roller shaft and the pressure roll mounted thereon are positively driven. The pressure roll is indicated at 17 and is secured upon the projecting front end of the shaft 15 in position to coöperate with the die roll in feeding the blank to the skiving knife. The pressure roll is pressed yieldingly toward the die roll with sufficient force to seat the blank against the bottom of the die in the die roll and feed the blank against the skiving knife by means of a spring 18 coiled around a rod 19 which is pivotally connected to an arm 20 extending upwardly from the arm 14 and forming an upward extension of the frame in which the pressure roll is mounted. The rod 19 passes through a hole in a flange projecting rearwardly from the standard 2 and the spring 18 is interposed between the flange and an adjusting nut 21 mounted upon the screw threaded end of the rod by means of which the spring 18 can be adjusted to produce the pressure required to force the blank into the die cavity and feed the blank to the skiving knife. The movement of the pressure roll toward the die roll is limited by means of an adjustable stop screw 22 mounted in the upper end of the arm 20 and arranged to bear against the rearwardly extending flange of the standard 2.

The skiving knife is indicated at 23 and is adjustably secured by means of screws 24 to a carrier 25 pivotally mounted upon the shaft 26 supported in the standard 2 and in the short standard 4. The cutting edge of the knife is located in close proximity to the periphery of the die roll and as near as possible to the lines of contact of the pressure roll and die roll with the blank. In order to bring the cutting edge of the knife into the desired position, three adjustments of the knife are provided. One of these adjustments is effected by means of the screws 24 which secure the knife to its carrier, and by means of adjustable stop screws 27 which bear against the lower edge of the knife. This adjustment moves the cutting edge of the knife vertically toward and from the lines of contact of the die and pressure rollers with the blank. Another adjustment of the knife is effected by means of adjusting screws 28 mounted in lugs on the base of the machine and arranged to engage opposite sides of a downwardly projecting portion of the knife carrier, this adjustment serving to move the edge of the knife toward and from the periphery of the die roll. The other adjustment of the knife brings its cutting edge parallel with the surface of the die roll, and is accomplished by means of adjusting screws 29 mounted in the standard 4 and engaging opposite sides of one end of

the shaft 26, the bearing for which is elongated to allow a lateral movement of the end of the shaft.

The radially movable gage for the leading end of the blank is indicated at 30, and consists of a plate mounted in a radial slot in the die roll and provided at its inner edge with a roll which engages a cam groove 31 in the face plate 32 secured to the front surface of the standard 2. The die roll rotates continuously, and during its rotation the blanks are fed by the operator, the leading end of a blank being placed against the end gage 30 when it is in approximately the position illustrated in Fig. 1, and the blank being held by the operator until gripped between the pressure and die rolls. Just as the blank is gripped between the pressure and die rolls, the end gage is retracted so as to pass by the pressure roll and skiving knife and is then projected beyond the surface of the die roll in position to be engaged by the end of the succeeding blank. The lower or bottom edge of a counter is more or less curved and in order to enable the leading end of the blank to be properly positioned with relation to the die, an edge gage 33 is mounted upon the end gage 30 being preferably made integral therewith. The curve of the lower edge varies considerably in different styles of counters, and it is therefore desirable that means be provided whereby the edge gage 33 may be arranged at different distances from the surface of the face plate 32. This is accomplished in the machine illustrated in the drawings by providing a number of end gages 30 with the edge gages 33 differently arranged thereon, and by removing one end gage from the roll and placing another therein when it is desired to skive a different style of counter.

In connection with the end and edge gages 30 and 33 an edge gage for the lower edge of the upper or rear portion of the blank may also be employed. This edge gage is indicated at 34 and consists of a bar seated in a horizontal slot in the upper end of the face plate 32. This edge gage is provided with screws 35 mounted to turn therein, and having a screw threaded engagement with the plate 32, by which the gage can be adjusted so as to be flush with the face of plate 32 or to project therefrom any desired distance. The screws 35 are held from longitudinal movement with relation to the gage 34 by means of pins 36 engaging grooves in the screws. When the leading end of the blank is placed against the end gage 30 and the side or lower edge of the blank is brought into contact with the edge gages 33 and 34 the blank is in position to be fed properly to the die of the die roll and to register therewith. A guard plate 37 secured to the arm 20 of the frame in which the pressure roll is mounted, extends over the pressure roll and acts to prevent the blank from passing down between the rolls in case the end of the blank slips off of the end gage 30 before being gripped between the rolls.

The construction of the improved pressure roll is illustrated in Figs. 4, 5 and 6. As shown in these figures, the roll consists of a rigid portion 38 and a yielding portion 39 on each side of the rigid portion. The rigid portion 38 consists of a metal disk, the peripheral surface of which is grooved or roughened. Each yielding portion 39 consists of a metallic sleeve or core and a covering of rubber. As illustrated, each of the three portions of the roll forms a separate section. These sections are placed upon the pressure roll shaft side by side and are caused to rotate with the shaft by means of splines on the shaft which engage grooves in the central bore of the sections. The rigid portion 38 is of less width than the die in the die roll as will be seen from an inspection of Fig. 3 and the pressure roll is so arranged with relation to the die roll that the rigid portion acts upon the center of the blank. To bring the rigid portion of the pressure roll and the die in the die roll into proper position with relation to each other, one of the rolls, preferably the pressure roll, can be adjusted endwise by loosening the screw which secures the pinion 16 to the shaft 15 and moving the shaft longitudinally in its bearings. As the blank passes between the pressure and die rolls, the rigid portion 38 of the pressure roll forces the central portion of the blank into the die and seats the blank firmly against the bottom of the die, practically the entire work of forcing the blank into the die and of feeding the blank against the skiving knife being performed by the rigid portion of the roll. The yielding surfaces of the portions 39 allow the edges of the blank to be embedded therein so that the blank is presented properly to the skiving knife and a counter the exact shape of the die is produced.

The rigid portion of the pressure roll is practically indestructible and as the yielding portions of the roll are not subjected to severe strains, these portions, although provided with rubber surfaces, are also extremely durable, so that the entire roll is capable of long and continued use without repair or renewal of any of its parts.

Having thus indicated the nature and scope of my invention and having specifically described the preferred embodiment thereof, I claim as new and desire to secure by Letters Patent:

1. A skiving machine, having, in combination, a die carrier provided with a die cavity, and a pressure roll comprising a rigid portion of less width than the die cavity and a yielding portion on each side of said rigid portion, substantially as described.

2. A skiving machine, having, in combination, a die carrier provided with a die cavity, and a pressure roll comprising a rigid portion of less width than the die cavity, and a portion on each side of said rigid portion provided with a yielding surface of rubber, substantially as described.

3. A skiving machine, having, in combination, a die carrier provided with a die cavity, and a pressure roll comprising a metallic section provided with a surface of less width than the die cavity and a separate section on each side of said metallic section, each of which comprises a metallic core and a rubber covering mounted thereon, substantially as described.

4. A skiving machine, having, in combination, a die carrier provided with a die cavity, and a pressure roll having a rigid surface of less width than the die cavity and a yielding surface on each side of said rigid surface, substantially as described.

5. A skiving machine having, in combination, a die roll, a frame pivoted below the die roll and extending above the same, a pressure roll mounted in said frame, a skiving knife mounted below the die and pressure rolls and a spring connected with the upper end of said frame for forcing the pressure roll toward the die roll, said frame being free to move under the force of said spring, substantially as described.

6. A skiving machine having, in combination, a die roll, a pressure roll, a skiving knife, a radially movable end gage mounted in the die roll and an edge gage mounted on the end gage, substantially as described.

7. A skiving machine having, in combination, a die, a pressure roll coöperating therewith comprising a rigid portion of less width than the die and a yielding portion on each side of said rigid portion, and means for adjusting the pressure roll endwise, substantially as described.

8. A skiving machine having, in combination, a die roll, a pressure roll coöperating therewith comprising a rigid portion of less width than the die in the die roll and a yielding portion on each side of the rigid portion, and means for relatively adjusting said rolls endwise, substantially as described.

9. A skiving machine, having, in combination, a die roll, a pressure roll, a skiving knife, a radially movable end gage mounted in the die roll, a face plate extending in a plane at right angles to the axis of the die and pressure rolls, and an edge gage for the lower edge of the blank at its rear end extending across said face plate, substantially as described.

10. A skiving machine, having, in combination, a die roll, a pressure roll, a skiving knife, a radially movable end gage mounted in the die roll, an edge gage for the lower edge of the blank at its leading end and a separate edge gage for the lower edge of the blank at its rear end, substantially as described.

11. A skiving machine, having, in combination, a die carrier provided with a die cavity, and a pressure roll, having a rigid surface of less width than the die cavity, and a yielding surface in proximity to the rigid surface and arranged to coöperate therewith in holding a blank in the die cavity, substantially as described.

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

FREDERICK L. ALLEY.

Witnesses:

FRED O. FISH,

HORACE VAN EVEREN.