(No Model.) 3 Sheets—Sheet 1.

J. R. SCOTT.

SKIVING MACHINE.

No. 528,448. Patented Oct. 30, 1894.

Fig. 1.

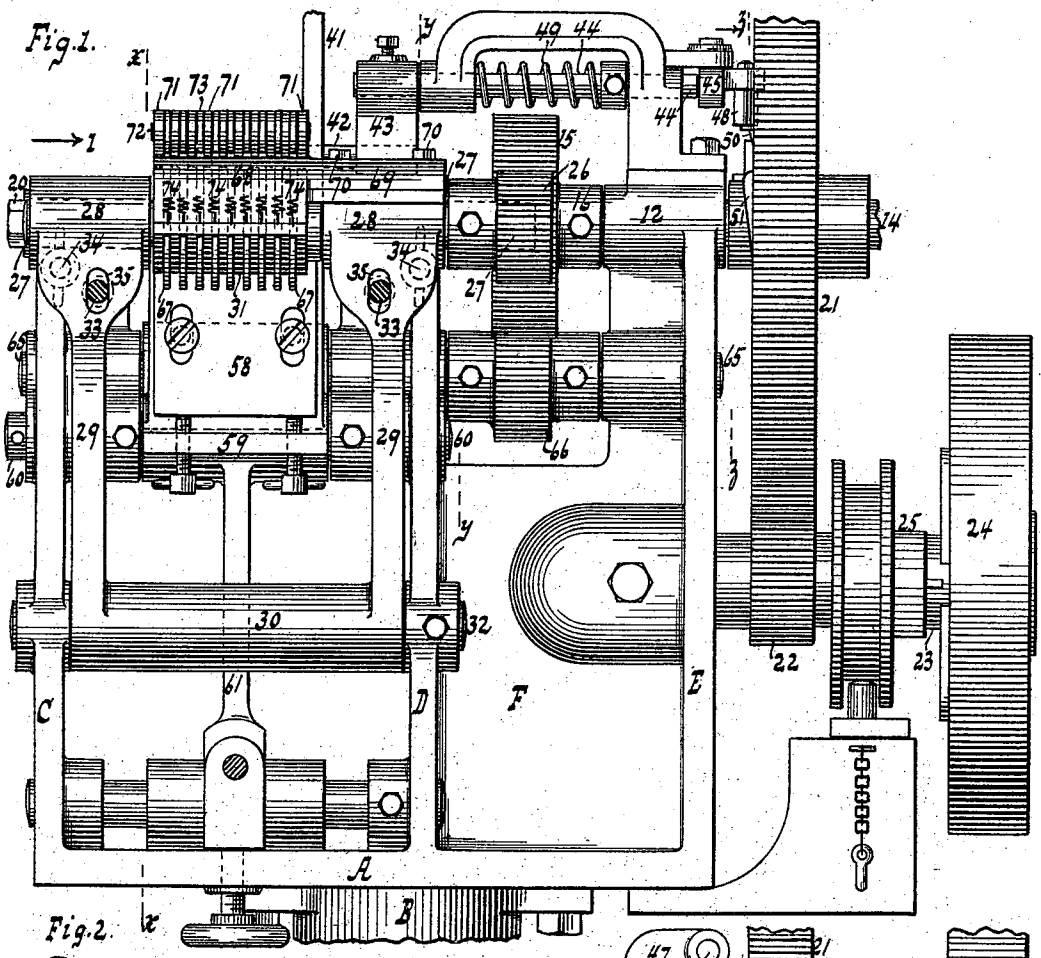

Fig. 2.

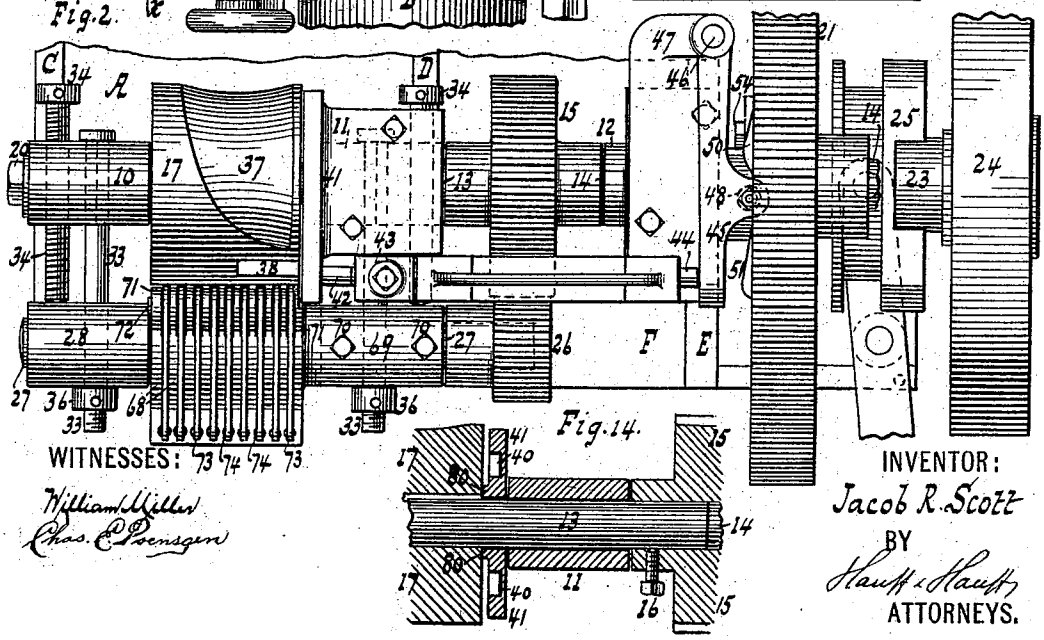

Fig. 14.

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Fig. 3.

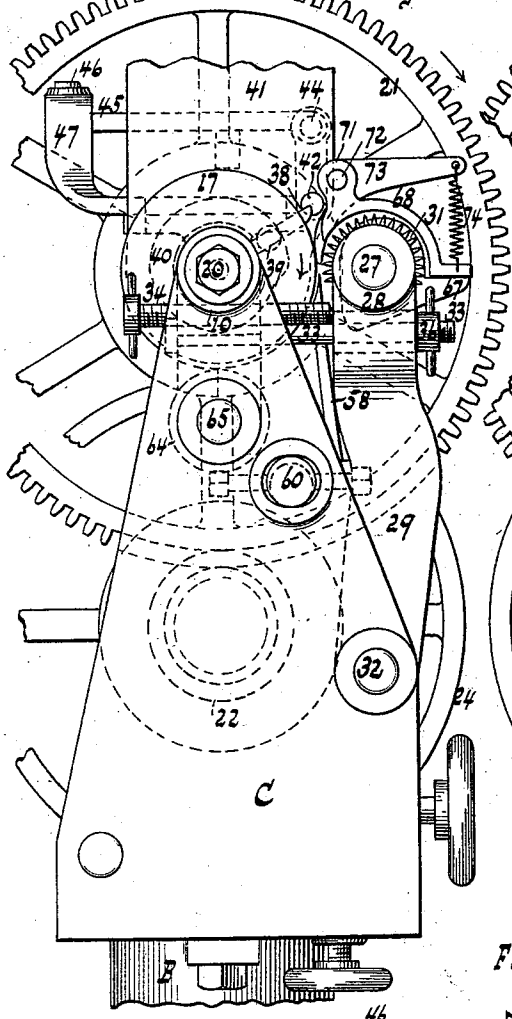

Fig. 4.

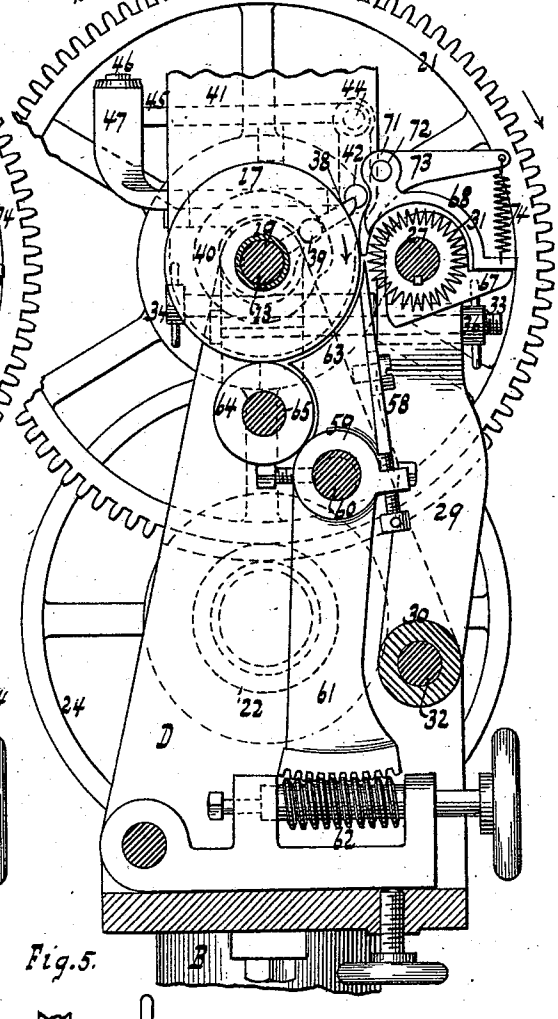

Fig. 5.

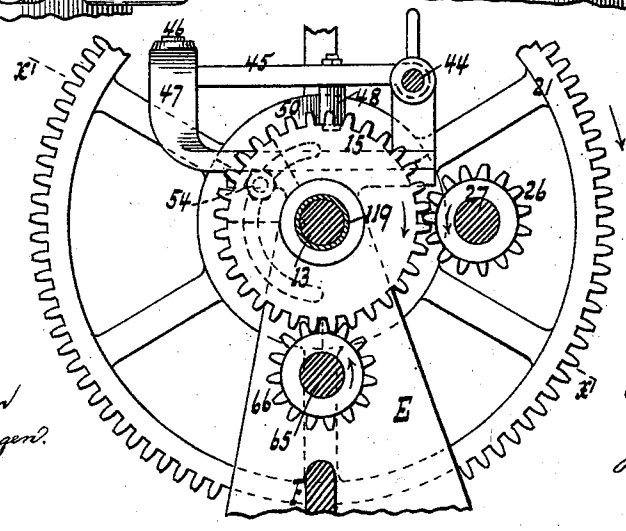

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Fig. 6.

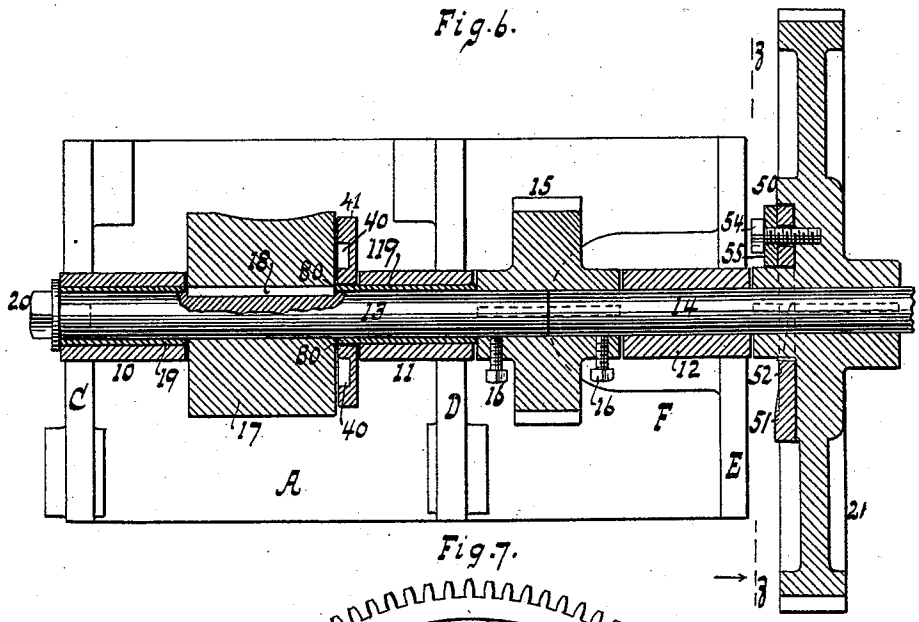


Fig. 7.

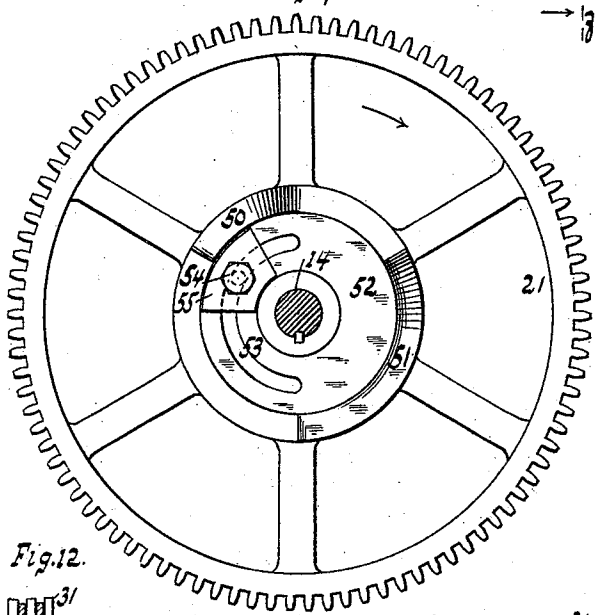


Fig. 10.

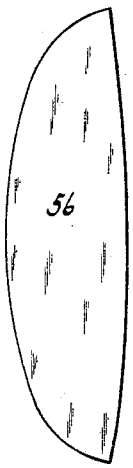


Fig. 11.

Fig. 12.

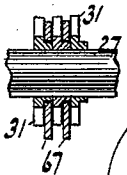


Fig. 8.

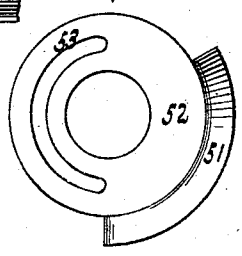


Fig. 9.

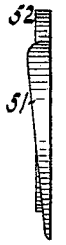
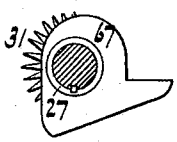


Fig. 13.



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UNITED STATES PATENT OFFICE.

JACOB R. SCOTT, OF NEW YORK, N. Y.

SKIVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 528,448, dated October 30, 1894.

Application filed March 3, 1894. Serial No. 502,221. (No model.)

To all whom it may concern:

Be it known that I, JACOB R. SCOTT, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Skiving-Machines, of which the following is a specification.

This invention relates to certain improvements in the construction of skiving machines as pointed out in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1 is a front view. Fig. 2 is a plan or top view. Fig. 3 is an end view looking in the direction of arrow 1, Fig. 1. Fig. 4 is a transverse vertical section in the plane *x x* Fig. 1. Fig. 5 is a partial transverse vertical section in the plane *y y* Fig. 1. Fig. 6 is a horizontal section of the die-roller and the means for mounting and driving the same in the plane *x' x'* Fig. 5. Fig. 7 is a transverse vertical section in the plane *z z* Fig. 1. Fig. 8 is a face view of the adjustable cam detached. Fig. 9 is a side elevation of the same. Figs. 10 and 11 are face views of counter-stiffeners of different size. Fig. 12 is a partial longitudinal section of the feed roller detached. Fig. 13 is a transverse section of the same. Fig. 14 shows a modification of the means for mounting the die-roller shown in Fig. 6.

In the drawings the letter A designates the base of a frame which is supported by a column B or any other suitable means. From this base rise three standards C, D, E and the standards D, E are connected by a web F, all these parts being cast integral or formed in any other suitable manner. The standards C, D, E are provided at their upper ends with eyes 10, 11, 12 respectively and the eyes 10, 11 form the bearings for a shaft 13 while the eye 12 forms the bearing for a shaft 14. (Best seen in Fig. 6.) When the shafts 13 and 14 are in the proper position in their bearings, their inner ends abut against each other (Fig. 6) and they are coupled together by a cog wheel 15 which is secured to each of the shafts by a set screw 16. On the shaft 13 is mounted the die-roller 17 which is connected with the shaft by a feather key 18 and when it is desired to remove the die roller, the shaft 13 is withdrawn through the eye 10. In order to permit this operation, a bushing 19 is placed in the eye 10 and when the shaft 13 is drawn outward, this bushing is carried along with the shaft by the key 18 and when the shaft together with the key has been drawn out far enough, the die-roller can be removed and another die-roller can be introduced without much loss of time. After the shaft 13 has been coupled with the shaft 14 by means of the gear wheel 15 and the set screws 16, 16, the bushing 19 is locked in the eye 10 by a set screw 20. On the eye 11 is firmly secured the edge gage 41 and in order to prevent the die-roller 17 from being jammed against the face of the edge gage, when the set screw 20 is drawn up tight, I provide a narrow ridge or abutment 80 which slightly projects beyond the face of the edge gage 41. This ridge or abutment can be formed on the face of the edge gage as shown in Fig. 14 or it can be formed by means of a bushing 119 (Fig. 6) which is fitted into the eye 11 and the rear end of which abuts against the hub of the cog wheel 15 while its front end projects slightly beyond the face of the edge gage and forms the abutment 80.

On the shaft 14 is firmly mounted a gear wheel 21 which engages a pinion 22 mounted firmly on the driving-shaft 23 to which motion is imparted by a pulley 24. This pulley is mounted loosely on the shaft 23 and it is thrown in and out of gear with the shaft by a suitable clutch mechanism 25.

The cog wheel 15 engages a pinion 26 which is mounted on a shaft 27. This shaft has its bearings in eyes 28 formed on the ends of arms 29 which extend from a hub 30, and on said shaft is mounted the feed roller 31. It will be seen from this description that the arms 29 and the hub 30 form a ⌊ shaped lever which is mounted on an arbor 32 passing through the hub 30 and supported in the standards C D. (See Figs. 1, 3 and 4.) The feed roller 31 is provided with sharp teeth and it is adjusted and locked at the desired distance from the die-roller 17 by means of two screw bolts 33 and two set screws 34. The inner ends of these screw bolts 33 pass through holes in the lower portions of the eyes 10 and 11 and their outer ends extend through slots 35 in the arms 29 of the ⌊ shaped lever (see Fig. 1) and are provided with nuts 36 (Fig. 2) by means of which the feed roller can be forced toward the die-

roller. The set screws 34 are tapped into the lower portions of the eyes 10 and 11 and their front ends can be made to bear against the eyes 28 of the ⌊⌋ shaped lever so that when the feed roller has been adjusted in the desired position by means of the nuts 36 of the screw bolts 33, it (the feed roller) can be firmly locked in this position by means of the set screws 34.

It will be noticed, that the nuts of the screw bolts 33 and the heads of the set screws 34 are located in such positions, that they can be easily reached by the operative without moving from his position in front of the machine and he is therefore enabled to adjust and lock the feed wheel speedily and accurately in the desired position.

The die-roller 17 is provided with a cavity 37 which conforms to the article to be skived and it contains an end-gage 38 which is fitted into a radial cavity in the die-roller as indicated in Figs. 3 and 4 and which is provided with a roller stud 39 that engages a cam groove 40 formed in the face of the edge gage 41 (Figs. 3, 4 and 6) so that it is moved radially out and in automatically as the die-roller revolves. The edge gage 41 is firmly secured to the standard D and through this edge gage extends the pusher 42 which is fastened in a head 43. This head is adjustably secured to a rod 44, the rear end of which abuts against a lever 45 (Figs. 1 and 2) which has its fulcrum on a pin 46 secured in a vertical position on a standard 47. From this lever extends a roller stud 48, (Figs. 1, 2 and 5) and the rod 44 is exposed to the action of a spring 49 by means of which the roller stud 48 is forced toward a cam 50 which is firmly secured to or formed on the inner surface of the cog wheel 21. On this cog wheel is secured a second cam 51 and in order to adapt my machine for skiving articles of different length, this second cam 51 is formed on a disk 52 (Figs. 7, 8 and 9) which is provided with a round hole to fit the hub of the cog wheel 21 and with a segmental slot 53 so that it can be set closer to or farther from the cam 50 as the length of the article to be skived may require. A clamping screw 54 serves to secure the cam 51 in the required position and with this clamping screw is used a segmental washer 55 so as to hold the parts firmly in position.

In Figs. 10 and 11 I have shown the blanks 56 and 57 for two counter-stiffeners of different sizes. If the blank 56 is placed against the end gage 38 and the edge gage 41, the pusher 42 keeps the front end of the blank a short distance away from the edge gage so that its position will correspond to the position of the cavity 37 in the die-roller. As the skiving operation progresses, the pusher recedes until the blank has been skived to the middle of its length. Then the pusher begins to advance again until the entire blank has been skived.

In an application for a patent filed by me September 14, 1893, Serial No. 485,501, I have described a pusher and a cam similar to the pusher 42 and to the cam 50, above described, but I have found since that time that it is of great importance, to use a second cam 51 in order to keep the blank in the proper position during the entire skiving operation. Furthermore I have constructed the second cam 51 so that it can be adjusted and that I am able to set it to correspond to the length of the cavities 17 in different die-rollers or (what is the same thing) to correspond to different blanks such as 56 and 57.

The knife 58 is secured to the knife stock 59 and this knife stock is mounted on an arbor 60 which has its bearings in the standards C D. From the hub of the knife stock extends an arm 61 provided with a toothed segment which engages a worm screw 62 as fully described in Letters Patent No. 493,189, granted to me March 7, 1893. It will be seen however, that the knife stock 59 (best seen in Fig. 4) is provided with a concave guide 63 which serves to hold the article during the skiving operation in the cavity 37 of the die-roller and to conduct the same between the die-roller and the pressure roller 64 which serves to mold the skived article in the same cavity in which it has been skived. This pressure roller is mounted on an arbor 65 on which is secured a pinion 66 which gears into the cog wheel 15 (Figs. 1 and 5). When the knife is being adjusted in the required position in regard to the die-roller, the concave guide 63 being formed on the knife stock will naturally assume the required position.

By referring to Fig. 4 it will be seen that the ⌊⌋ shaped lever which forms the bearings for the shaft 27 of the feed roller 31 is situated on the outside of the knife stock 61 and when this ⌊⌋ shaped lever is swung outward on its arbor 32, free access can be had to the knife so that much time and labor can be saved, whenever the knife has to be removed and readjusted. The feed roller 31 is made of a series of disks (see Fig. 12) which are keyed to the shaft 27 and which are held at small distances apart by hubs formed on the successive disks, thereby forming a series of annular or circular cavities in the feed-roller. On these hubs are hung the strippers 67 which prevent the teeth of the feed wheel from becoming clogged up. Over the feed wheel is placed a cap 68 from which extends a concave arm 69 which is secured to one of the eyes of the ⌊⌋ shaped lever by screws 70 (Figs. 1 and 2.) From this cap rises a series of lugs 71 which form the bearings for a pin 72 on which are mounted the levers 73. These levers are exposed to the action of springs 74 which have a tendency to press the inner ends of the levers against the surface of the die-roller 17.

The blank to be skived is pressed against the end gage 38, and as the die-roller 17, and the feed-roller 31, rotate, the end gage acts against the spring-pressed levers 73 and pushes them back until the end gage is moved

radially inward by cam 40, so that the spring-pressed levers 73 press the front end of the blank close against the surface of the die-roller.

I do not claim in this application the combination with the die-roller, the feed roller and the knife of an end gage movably fitted into the die-roller and the means for imparting motion to this end gage. Neither do I claim in this application the combination with the die-roller, the feed roller, the knife and the end gage of a pusher moved by a cam and spring. Neither do I claim in this application the combination with a knife and a die-roller of a shaft carrying a feed roller composed of sections, gravitating clearing plates between the roller sections, and a stop arranged in the path of the spurs of the clearing blades, all of which parts have been fully described in an application for a patent filed by me September 14, 1893, Serial No. 485,501, and allowed November 25, 1893.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a knife, and a feed-roller, of a die-roller provided with a radially movable end-gage, means for moving the end-gage radially, and spring-actuated levers having portions arranged in the path of the end-gage when the latter is projected, substantially as and for the purposes described.

2. The combination with the die-roller, the feed roller, the knife, the end gage, the side gage and the cam actuated pusher of spring actuated levers for holding the material against the die-roller during the operation of skiving substantially as described.

3. The combination with a knife, and a feed-roller having a series of circular cavities, of a die-roller having a radially movable end gage, means for moving the end gage radially, a cap mounted over the feed-roller, and a series of spring-actuated levers pivoted on said cap and having portions arranged in the path of the end gage when the latter is projected, substantially as and for the purposes described.

4. The combination with the die-roller, the feed roller, the knife, the end gage, the edge gage and the pusher of two cams, one for actuating the pusher at the beginning of the skiving operation and the other for actuating the pusher toward the end of the skiving operation substantially as described.

5. The combination with the die-roller, the feed roller, the knife, the end gage, the edge gage, and the pusher of a fixed cam for actuating the pusher at the beginning of the skiving operation, a second cam for actuating the pusher toward the end of the skiving operation and means for adjusting this second cam according to the length of the material to be skived substantially as described.

6. The combination with a concave die-roller, a feed roller and a knife of a pressure roller for grasping the material during the operation of skiving and molding it in the same cavity in which it is skived substantially as described.

7. The combination with a concave die-roller, a feed roller and a knife of a pressure roller for grasping the material during the operation of skiving and molding it in the same cavity in which it is skived and a guide for conducting the material between the pressure roller and the die-roller substantially as described.

8. The combination with a concave die-roller, a feed roller and a knife of a pressure roller for grasping the material during the operation of skiving and molding it in the same cavity in which it is skived, a guide for conducting the material between the pressure roller and the die-roller, and means for adjusting the guide substantially as described.

9. The combination with a concave die-roller, a feed roller and a knife of a pressure roller for grasping the material during the operation of skiving and molding the same in the same cavity in which it is skived, and a knife stock provided with a concave guide way for conducting the material to the pressure roller substantially as described.

10. The combination with the die-roller, the knife and the feed roller of a ⌊⌋ shaped lever which swings on pivots mounted in the main frame and the free ends of which form the bearings for the shaft of the feed roller, two screw bolts secured in the main frame and extending through slots in the upright branches of the ⌊⌋ shaped lever and two set screws tapped into the main frame and acting upon the inside faces of the upright branches of the ⌊⌋ shaped lever for adjusting and locking the feed wheel in the required position substantially as described.

11. The combination with the die-roller, the feed roller and the knife of a knife stock secured to the main frame by a shaft situated beneath the die-roller, a lever which forms the bearings for the shaft of the feed wheel and a shaft which forms the bearing for said lever and is mounted in the main frame outside of the knife stock, so that this lever together with the feed wheel can be turned down to give free access to the knife stock and the knife substantially as described.

12. The combination with the die-roller and the edge gage of a shaft composed of two sections 13, 14, a clutching device for retaining these sections in line with each other and with their bearings, solid eyes 10 and 11 on the frame to form the bearings for the section 13 a removable bushing 19 fitted into the eye 10, a feather key 18 secured in the section 13 of the shaft and engaging a corresponding seat in the die-roller, a set screw 20 in the outer end of section 13 and a ridge or abutment 80 to prevent the die-roller from getting jammed against the face of the edge gage by the action of the set screw 20 substantially as described.

13. The combination with the die-roller and the edge gage of a shaft composed of two sec-

tions 13, 14, a clutching device for retaining these sections in line with each other and with their bearings, solid eyes 10 and 11 on the frame to form the bearings for the section 13 of the shaft, a removable bushing 19 fitted into the eye 10, a feather key 18 secured in section 13 of the shaft and engaging a corresponding seat in the die-roller, a set screw 20 in the outer end of section 13, a bushing 119 fitted into the eye 11 and forming a ridge or abutment 80 to prevent the die-roller from becoming jammed against the face of the edge gage by the action of the set screw 20 substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JACOB R. SCOTT.

Witnesses:
WM. C. HAUFF,
E. F. KASTENHUBER.