(No Model.) 3 Sheets—Sheet 1.

W. E. & D. E. DOOLITTLE.

MACHINE FOR TURNING RIBBED COLLARS FOR UMBRELLAS.

No. 420,045. Patented Jan. 28, 1890.

Fig. 1.

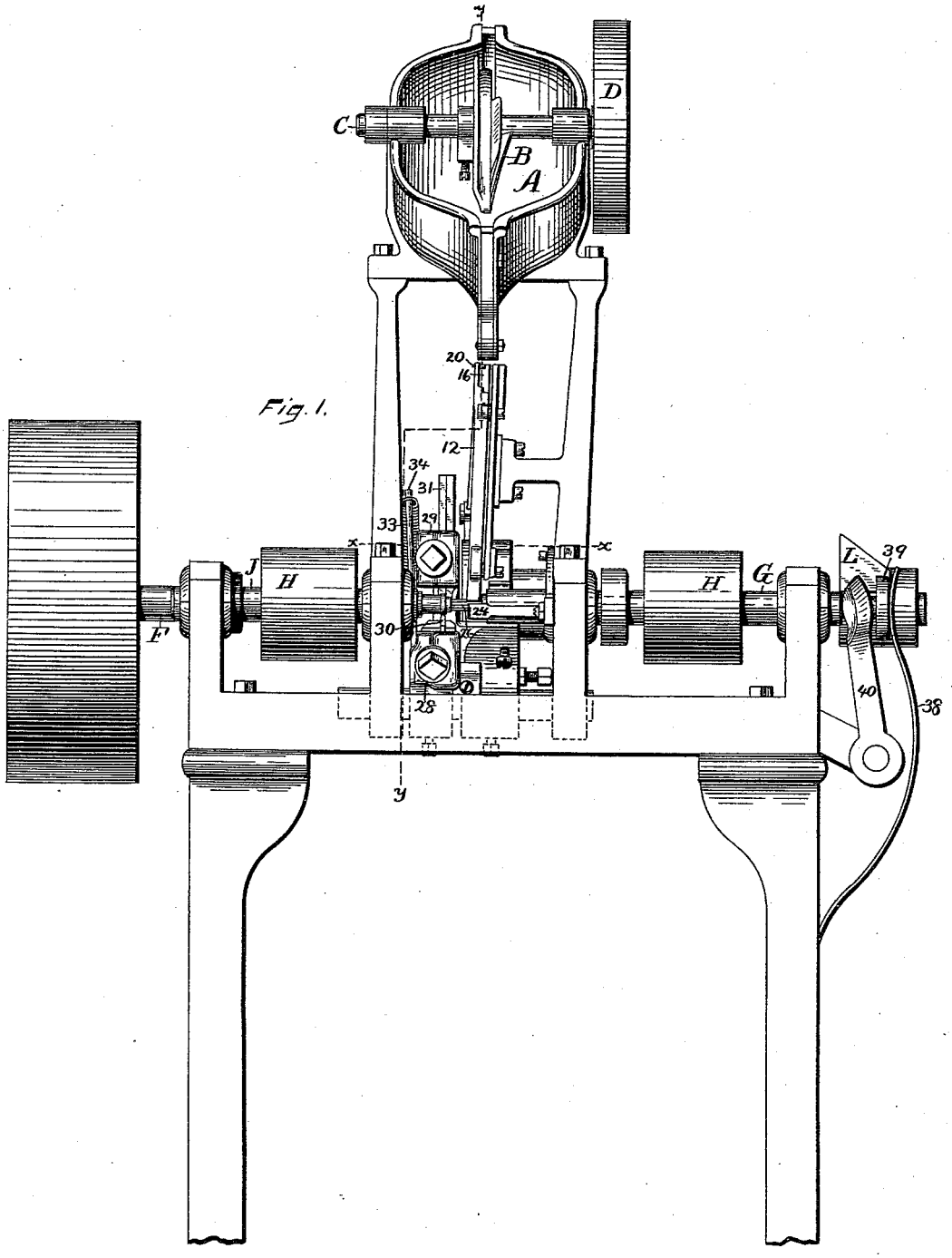

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Fig. 2.

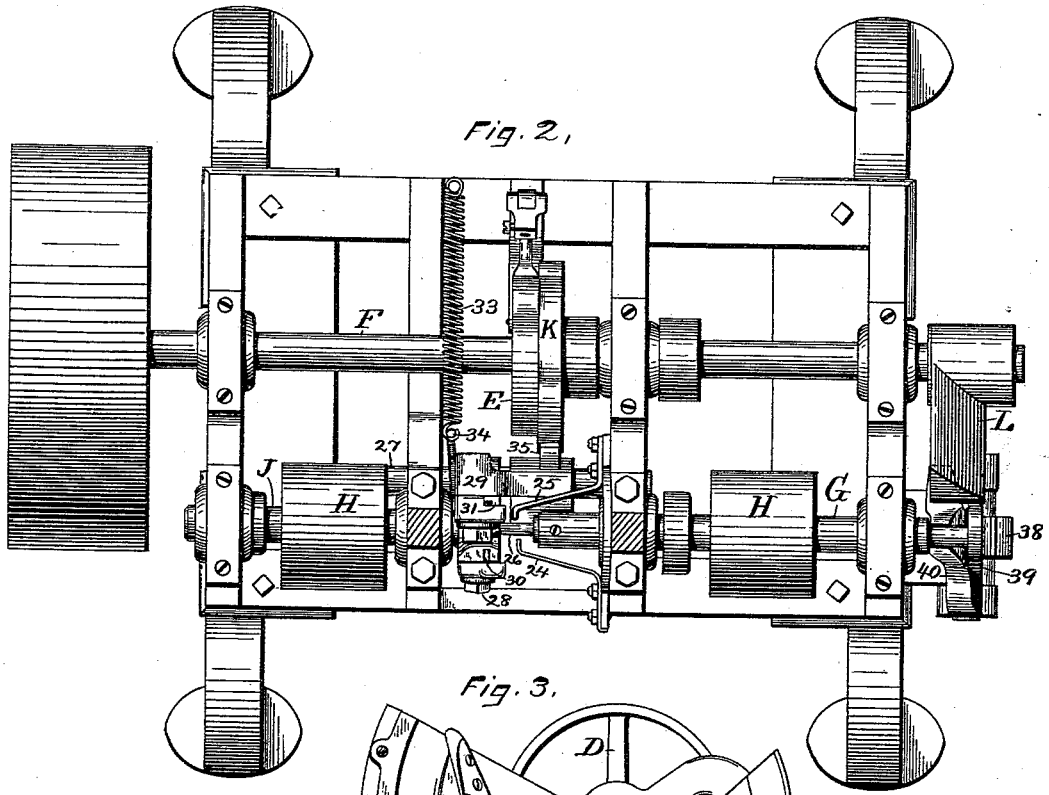

Fig. 3.

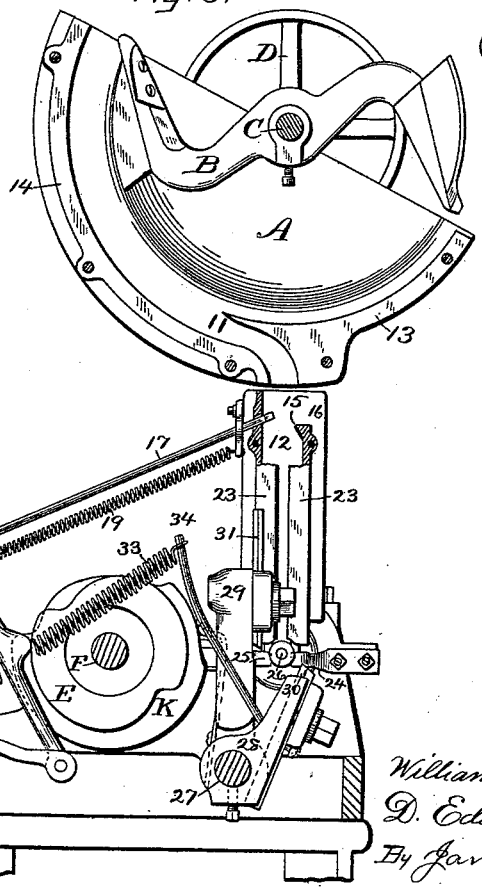

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Fig. 4.

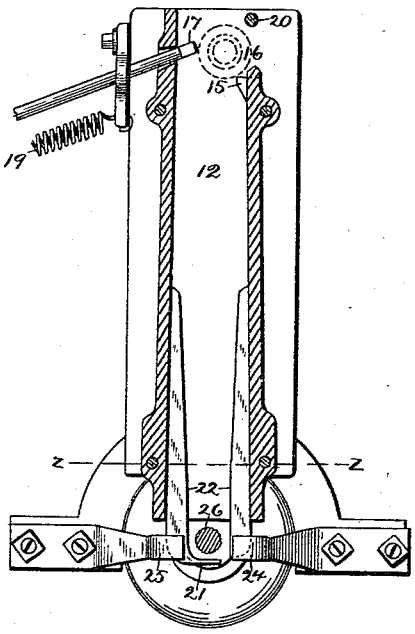

Fig. 5.

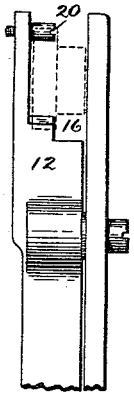

Fig. 6.

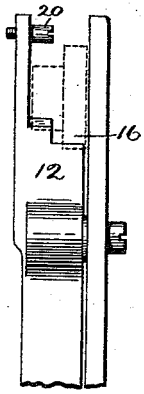

Fig. 7.

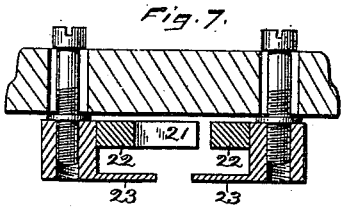

Fig. 8.

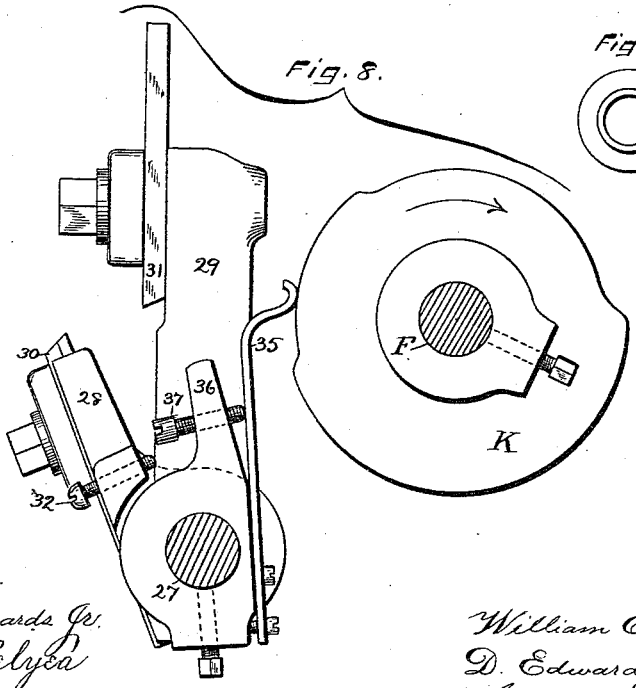

Fig. 9.

Fig. 10.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR TURNING RIBBED COLLARS FOR UMBRELLAS.

SPECIFICATION forming part of Letters Patent No. 420,045, dated January 28, 1890.

Application filed June 19, 1889. Serial No. 314,778. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM E. DOOLITTLE and DAVID EDWARD DOOLITTLE, both citizens of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Turning Ribbed Collars for Umbrellas, of which the following is a specification.

Our invention relates to improvements in machines for turning ribbed collars of umbrellas or other similar-shaped articles; and the chief object of our invention is economy in the production of such articles by the production of an automatic turning-machine for producing the same.

In the accompanying drawings, Figure 1 is a front elevation of our machine. Fig. 2 is a plan view with the chute removed and its supporting-frame shown in horizontal section on the line *x x* of Fig. 1. Fig. 3 is a transverse vertical section of the same on line *y y* of Fig. 1. Fig. 4 is a vertical section of the chute on a plane at right angles to the lathe-spindle, together with some of the adjacent parts. Fig. 5 is a side elevation of the upper end of the chute, together with one of the blanks indicated in broken lines as passing into the chute in its proper position. Fig. 6 is a like view of the same with a blank indicated by broken lines as having reached the upper end of the chute in an improper position. Fig. 7 is a horizontal sectional view of the chute on the line *z z* of Fig. 4. Fig. 8 is a detached view showing the right-hand side of the tool-posts and the cam for operating the same, the shafts upon which the cam and tool-posts are mounted being shown in section. Fig. 9 is a side elevation of one of the flanged collars as turned upon our machine, and Fig. 10 is an edge view of the same. Figs. 4 and 8 are on a scale twice the size of that of Figs. 1, 2, and 3; and Figs. 5, 6, 7, 9, and 10 are on a scale twice that of Figs. 4 and 8.

Our machine as illustrated is designed for turning and grooving ribbed collars of umbrellas of the kind known as "notches;" but it is also applicable for turning and grooving umbrella-runners or analogous work.

A designates the hopper, into which a lot of blanks are promiscuously placed and acted upon by the revolving stirrer B, to change their position within the hopper and cause them to work down through the groove 11, Fig. 3, in the bottom of the hopper to the upper end of the chute 12. The stirrer B is mounted upon the shaft C and driven by means of a belt running upon the pulley D, attached to said shaft. The bottom of the hopper is made of circular form and concentric with the shaft C, the front portion 13 being closely approached by the ends of the stirrer-arms, so that the stirrer will sweep away the blanks therefrom, while the rear portion 14 is removed from the path of the stirrer-arms a distance a little greater than the diameter of one of the blanks, so that a blank may lie upon this portion of the hopper and not be swept out of its position by the stirrer.

The groove 11 (see Fig. 3) leads from the portion 14 of the hopper to the upper end of the chute 12. The groove 11 is a simple rectangular groove in cross-section, so that the blanks will pass through it when they face in either direction, provided, however, that their edges are substantially vertical.

In the upper part of the chute 12 and upon one side thereof we form an inward projection 15, immediately above which is a lateral opening 16 of a shape and size which will let the blanks pass out when they enter the chute in the position illustrated by the broken lines in Fig. 6. When a blank enters the chute in this position, the ribbed portion engages the projection 15 and the end of the knock-out 17, which will prevent the blank from passing down into the chute and arrest it in the position represented in Figs. 4 and 6. The cam E on the cam-shaft F, acting upon the rocking arm 18, then permits the spring 19 to force the knock-out 17 obliquely upward and forward against the blank and force said blank out of the chute. If the blank comes down in a proper position, as indicated in Fig. 5, the screw 20, which partially shapes the opening 16, will, with the lower side of the opening, come in contact with the ribbed end of the collar-blank and prevent it from fall-

ing through the lateral opening, while the projecting end of the knock-out 17 and projection 15 come opposite the smaller portion of the blank and permit it to fall down into the chute. Thus blank after blank will descend through the chute and be arranged one above the other in an edgewise direction and all facing the same way, while those which from time to time enter the upper end of the chute faced in the opposite direction are ejected by the knock-out. At the lower end of the chute there is a stop 21 for arresting the descent of the bottom blank and two ledges 22 opposite the smaller diameter of the blank, while the larger or ribbed portion of the blank is at one side of said ledges. The left-hand side of the chute, the side facing the tool-post, is provided with side guides 23, which protect that side of the chute, but which terminate a distance equal to the diameter of one blank above the stop 21. The opposite side of the chute is also open at the lower end. At this point we arrange on the left-hand side of the chute two spring-arms 24 and 25, the arm 25 being stouter and somewhat longer than the arm 24. These serve to retain the lower blank in the chute from working forward accidentally, while the stouter arm serves also as a knock-off, as hereinafter described.

G designates a lathe-spindle carrying a driving-pulley H and driving-arbor 26, and J designates a companion spindle in alignment therewith and provided with a driving-pulley H and a female center which receives the end of the turning-arbor 26. The axis of the driving-arbor is above the stop 21 and coincident with the open sides of the chute at its lower end.

27 designates a rock-shaft, to which we attach the tool-posts 28 and 29, bearing, respectively, turning-tools 30 and 31. The position of one of these tool-posts with reference to the other may be adjusted by means of the adjusting-screw 32, Fig. 8. A spring 33 is secured by one end to the frame of the machine, and by its opposite end to an arm 34 of the tool-post 28, so as to pull both tool-posts backwardly by pulling on the tool-post 28. The tool-post 29 is provided with a spring 35 and a projecting arm 36, having an adjusting-screw 37, as shown in Fig. 8. This spring rests upon the cam K, which acts to throw the tool-post 29 forward, and with it the tool-post 28. The spindle G is a sliding spindle, and is pressed upon at one end by means of the spring 38 for forcing it in one direction. It is also provided with a shoulder 39, against which the upper end of a rocking arm 40 bears, which rocking arm is acted upon at every revolution of the cam-shaft F by means of the cam L, for forcing said spindle with a quick motion in the opposite direction.

In operation blanks are placed promiscuously within the hopper and delivered into the chute in the manner before described, and those which enter the chute faced in the wrong direction are ejected therefrom. The cam-shaft acts upon the cam L to draw the spindle backwardly until the turning-arbor 26 is drawn to one side of the lower end of the chute, so that the lowermost blank is free to fall until it comes in contact with the stop 21. This brings its central hole substantially in axial alignment with said arbor. The rocking arm 40 falls off the shoulder of the cam L, and the spring 38 sends the spindle forward, thereby forcing the driving-arbor through the hole in the lowermost blank, and when the blank is firmly seated thereon the continued sliding motion of the spindle and arbor forces the blank against the springs 24 and 25 with such force that they open and let the driving-arbor and the work thereon pass on and bring the work up against the female center or end of the spindle J in proper position opposite the turning-tools. Belts running upon the pulleys H H of the spindles rapidly revolve them and the work. The cam-shaft is also being driven by any suitable means. The cam K presses upon the spring 35 and throws the tool-post 29 forward, carrying the tool-post 28 with it. The spring 35 immediately bears upon the longest concentric face and the face farthest from the shaft, and the tool 31 is brought against the periphery of the work to turn it, the tool being shaped on its end in conformity with the periphery of the desired work. The cam revolves in the direction indicated by the dart in Fig. 8. The spring then bears upon the smaller concentric face of the cam, when the spring 33 pulls the tool-posts in the opposite direction and brings the tool 30 up against the work to turn the groove in the ribbed portion. The succeeding part of the cam then throws the tool-posts half-way back again and brings them into a position where neither tool will act upon the work. The cam L then again acts to withdraw the spindle G. As the spindle thus withdraws the work is caught by the stouter spring 25, thereby knocking off the work from the driving-arbor as said arbor recedes. While the tools are in said intermediate position, the rocking arm 40 drops by the shoulder of the cam L, and another piece of work for turning is carried into the position before described and operated upon in the same way, and so on indefinitely.

We claim as our invention—

1. The combination of a hopper for receiving blanks promiscuously, the chute leading therefrom provided with a lateral opening and projections for stopping the work when faced in one direction, but permitting it to pass when faced in the opposite direction, the knock-out 17, and operating mechanism for ejecting the work thus stopped, substantially as described, and for the purpose specified.

2. The combination of the chute 12, provided with projections and a lateral opening, the form of the chute and projections being such as to arrest the work when faced in one direction and permit it to pass when faced in

the opposite direction, the knock-out 17, arranged upon the side of the chute which is opposite the lateral opening, and mechanism for reciprocating said knock-out, substantially as described, and for the purpose specified.

3. The combination of the chute 12, provided with side ledges 22 and stop 21, said ledges projecting downwardly below the sides of the chute proper, the springs 24 and 25 by the side of said ledges, and a reciprocating driving-arbor arranged to pass between said ledges, substantially as described, and for the purpose specified.

4. The combination of a chute open upon two sides at its lower end, the reciprocating driving-arbor, and one or more springs 25, arranged to spring away from said arbor when the work is forced out from under the end of the chute and to spring toward said arbor and serve as a knock-out when the driving-arbor recedes, substantially as described, and for the purpose specified.

5. The combination of the tool-post shaft 27, the swinging tool-posts 28 and 29, mounted thereon, the adjusting-screw 32, for adjusting their position relatively to each other, and mechanism for operating said tool-posts, substantially as described, and for the purpose specified.

6. The combination of a cam, the tool-post 29, arm 36, rigidly mounted thereon, the spring 35, resting upon the periphery of said cam, and the adjusting-screw 37, passing through said arm 36, with its end bearing upon said spring, substantially as described, and for the purpose specified.

7. The combination of a reciprocating spindle and driving-arbor, tool-posts 28 and 29, oscillating on a common center, a spring for moving said tool-posts in one direction, and the cam K, for moving them in the opposite direction, substantially as described, and for the purpose specified.

8. The combination of the chute 12, open upon two sides at its lower end, the sliding spindle G, carrying a driving-arbor, the spring 38, for forcing said arbor in one direction, and the cam L and rocking arm 40, for forcing said spindle in the opposite direction, substantially as described, and for the purpose specified.

9. The combination of a reciprocating spindle, a chute open upon two sides at its lower end and extending downward below the axis of said spindle, and the stop 21 at the lower end and below the horizontal plane of said axis, substantially as described, and for the purpose specified.

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