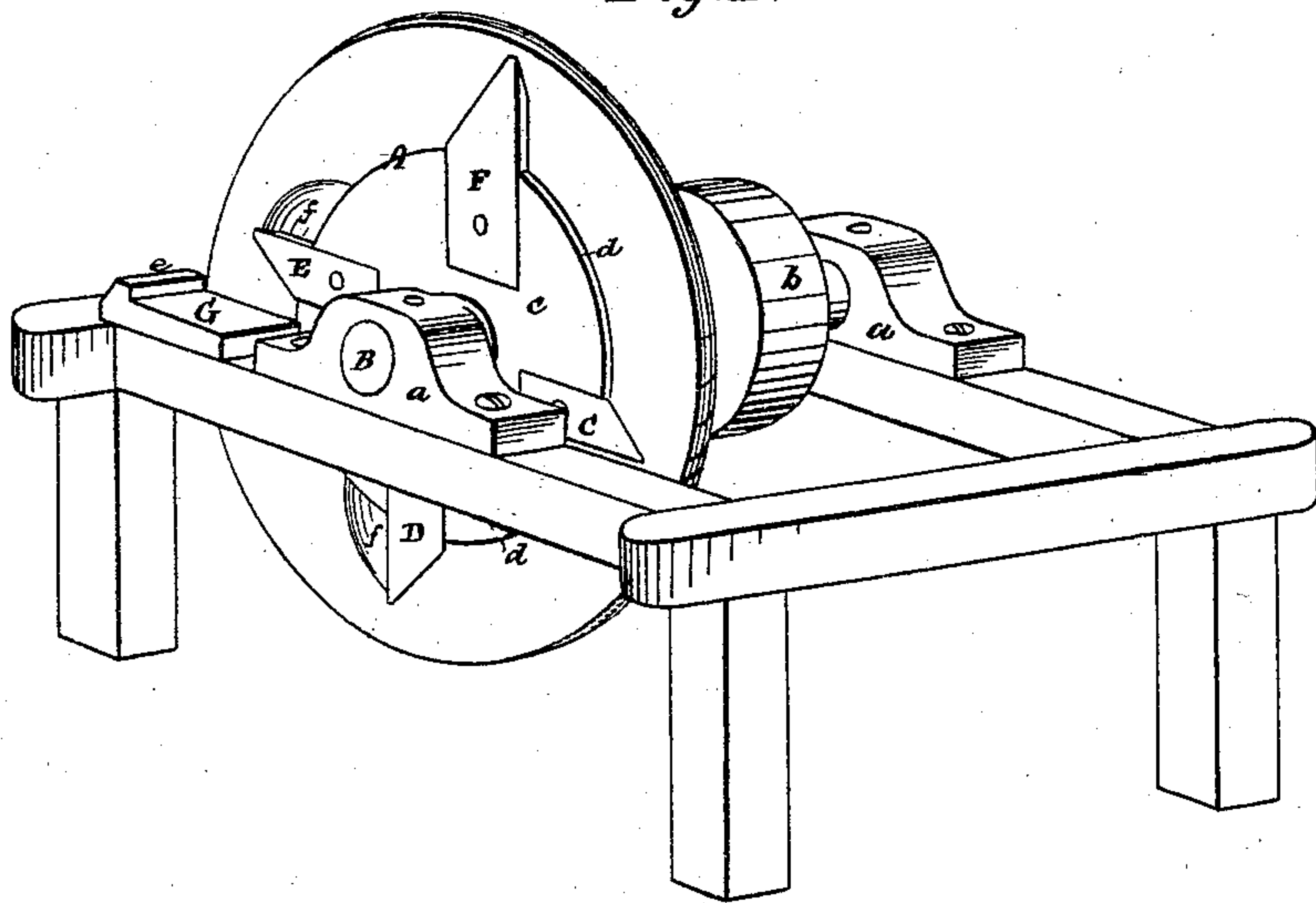


**W. N. SPRAGUE.**  
**Machinery for Making Wood-Shanks for Boots and Shoes.**

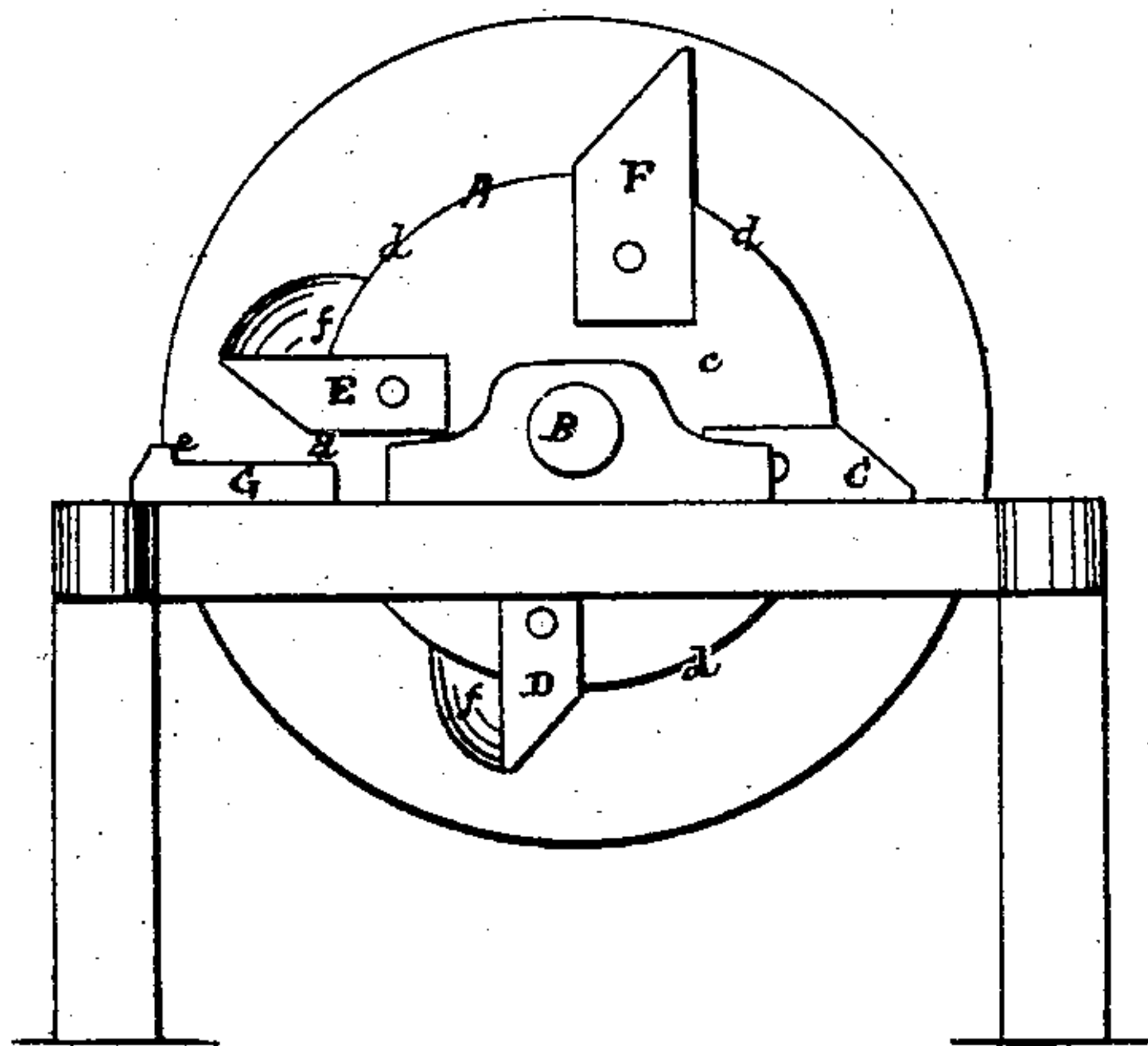
No. 145,024.

Patented Nov. 25, 1873.

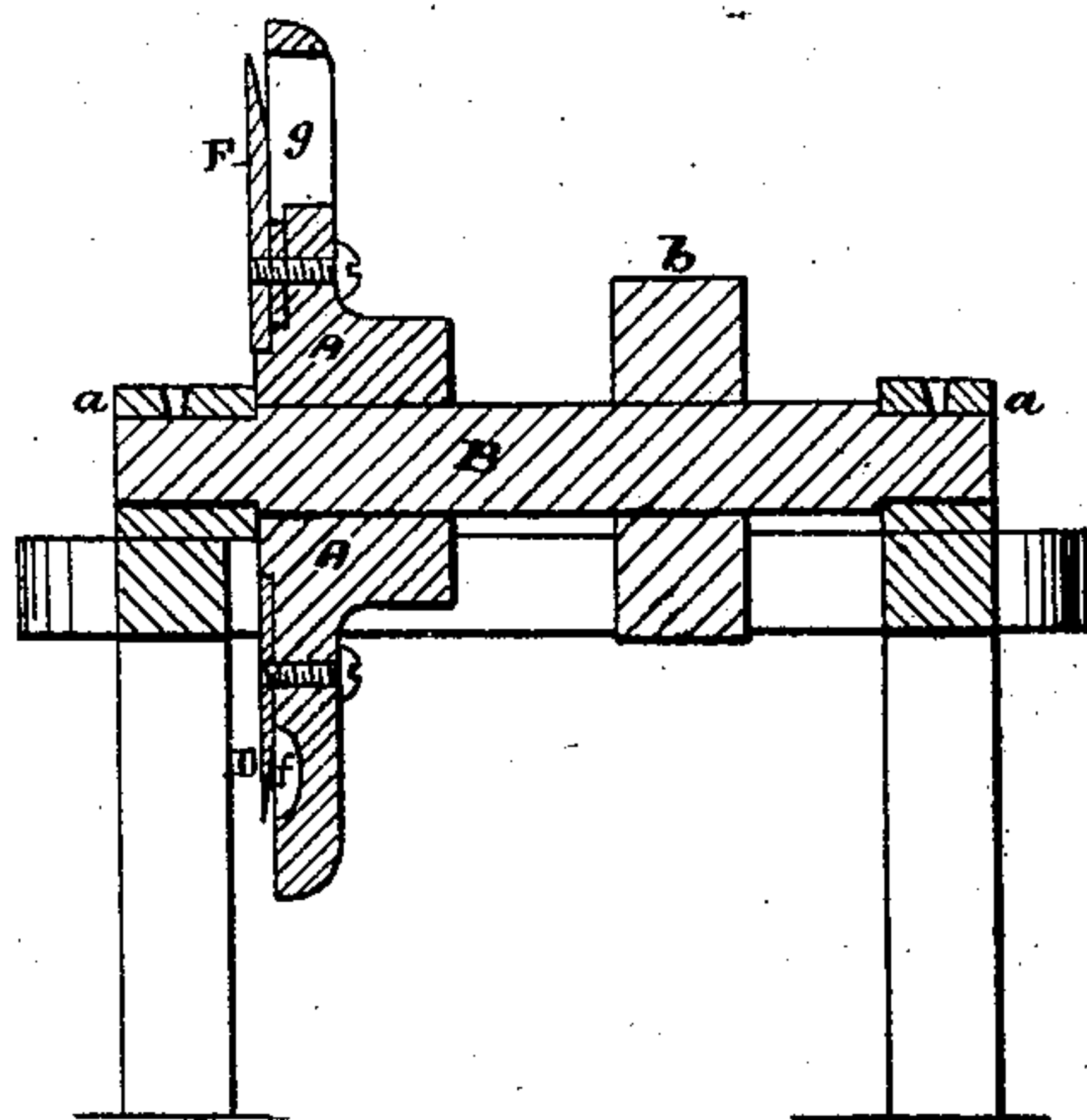
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses.*

*Erill Dick*  
*Wm & Chaffee*

*Inventor.*

*Watson N. Sprague*  
*by atty. Rollins*



# UNITED STATES PATENT OFFICE.

WATSON N. SPRAGUE, OF KEENE, NEW HAMPSHIRE, ASSIGNOR TO HIMSELF AND GEORGE GOODYEAR, OF ELIZABETH, NEW JERSEY.

## IMPROVEMENT IN MACHINERY FOR MAKING WOOD SHANKS FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. **145,024**, dated November 25, 1873; application filed October 2, 1873.

*To all whom it may concern:*

Be it known that I, WATSON N. SPRAGUE, of Keene, in the county of Cheshire and State of New Hampshire, have invented certain new and useful Improvements in Machinery for Cutting and Splitting Wood Shanks for Boots and Shoes, of which the following is a specification:

This invention relates to machinery to be used in the manufacture of shank-pieces consisting of two or more leaves from one solid piece of wood or similar material, as described in the patent granted to George Goodyear, September 12, 1871, No. 118,851.

The machinery hereinafter described is designed to form the leaves—two or more in number, as desired—in the solid piece of wood, by making in said piece a series of cuts or slits, which divide a portion of the same into leaves or strips of the required number and thickness.

The characteristic features of the machine are as follows: First, a rotary tool-holding disk or its equivalent, carrying on its face a series of blades or cutters, which are set at different distances from the face of the holder, so that each blade may cut its own path through the wood. Second, a guide-block or support for the wood to be operated on, so located that the wood, when placed on it, may be pressed or fed up against the face of the cutter-holding disk in proper position in the path of the revolving cutters. Third, in connection with the cutters for making the slits in the shank-piece, I use a cutting-blade, fixed also to the face of the holding-disk, and of such size and dimensions as to completely sever the split shank-piece from the main piece or block of wood, a discharge-opening being provided through the disk in rear of said blade, so that the severed shank can pass through said opening, and clear and fall from the cutting apparatus, without rendering it necessary to stop the machine for this purpose.

In this way, with a continuously-rotating tool, a block of wood can be divided up into shank-pieces with great celerity, one piece being produced at each revolution of the cutting-head, the slitting-blades first forming the leaves, and the large blade following them,

and severing the slit shank from the main block.

The accompanying drawing represents the manner in which my invention is or may be carried into effect.

Figure 1 is a perspective view of a cutting mechanism made in accordance with my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical section of the same, in a plane passing longitudinally through the axis of the shaft of the revolving cutter.

The disk or plate that holds the cutter is marked A. It is fixed on a shaft, B, supported in bearings *a* in a suitable frame, and revolved by suitable means—as, for instance, by belting passing around pulley *b*, and taking its movement from a suitable driving shaft or pulley.

The cutter-holding disk is here shown and arranged to revolve in a vertical plane. Upon its outer face are fixed the cutters. These cutters are here four in number, and are lettered C D E F. They are designed to form a shank of four leaves. It will be understood that the cutters will vary in number according to the number of leaves the shank is to have. The cutters C D E form the slits which divide the shank into leaves, and I shall call them the “slitting-cutters.” Cutter F severs the slit shank from the stock or main block of wood, and I shall term it the “separating-cutter.”

At a suitable distance from the periphery of the disk, about equal to the length of the shank, there is formed a raised central portion or boss, *c*, of circular form, having the axis B as its center. The periphery of this raised portion or boss constitutes a ledge or shoulder, *d*, as seen in Fig. 1. In front of the disk is located the guide and support G, for the wood to be operated on, which guide occupies the position represented in the drawings, and is formed with a ledge or guide-shoulder, *e*, at a point where it will about meet the point or outer end of the separating-cutter F when the latter revolves. The stock or wood from which the shanks are formed is of such dimensions as to fit between this shoulder *e* and the annular ledge *d* on the disk, and its end is pressed up so as to be in contact with and lie flat against that part of the face of the disk



intervening between the two shoulders *d e*. The slitting-cutters are designed, in this instance, to make slits of different lengths in the shank. Cutter C, which should make the first cut, is the shortest blade, and is set nearest to the face of the disk, space being left between the cutter and the disk sufficient to make the first leaf of the desired thickness. The second cutter, D, is a little longer than cutter C, and is set at a greater distance from the disk than the latter cutter, so as to form a second and longer slit in the stock, in a plane in advance or in front of the slit made by cutter C. The third cutter, E, which forms the third leaf, is longer than cutter D, and is set at a greater distance from the face of the disk than is the latter cutter, in order to form a third slit at the required distance from the second slit. The fourth cutter, F, then follows. Its length is equal to or slightly greater than the distance between the ledges or shoulders *d e*, so that it will completely sever from the main stock that portion previously partially slit by the preceding cutters. It is set farther from the disk than the cutter E, so that the proper thickness of leaf may intervene between its line of cut and the slit made by E. In rear of the slitting-cutters the disk is recessed, as shown at *f*, these recesses being of sufficient size to permit the passage of the portion of the wood which must intervene between the cutter and the disk as the cutter passes through the stock. At the point where the separating-cutter is located a discharge-opening, *g*, is formed through the disk, of suitable size and shape to permit the discharge through it of the split shank severed by said cutter from the main stock. The cutting-edges of the cutters are made slanting, as shown, so that in their revolution they will give a shear-cut or draw-cut in slitting the wood, instead of having the chopping action which would result were the edges radial.

The guide G and the cutters can be made adjustable, and, if desired, interchangeable sets of cutters may be provided for different kinds of work. I would remark, also, that in lieu of the arrangement of cutters and disk above described, the cutters may be all set in the same plane, and the face of the disk against which the stock is pressed may be so shaped that it will be at one distance from one cutter and at another distance from another cutter, thus accomplishing the same result as

in the arrangement herein represented, the difference being that in the modification suggested the cutters would all be in one plane, while the face of the disk would be formed in several different planes, and would thus have an irregular or cam-like formation.

Other ways of arriving at the same result may be readily devised without departure from the principle of my invention.

Having described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. In machinery for cutting and splitting shanks for boots and shoes, the combination of a rotary cutter-holding disk, a series of cutters set at different distances from the face of said disk, so as to make their cuts in different planes, and thus form the leaves of the shank, and a guide for supporting the stock to be operated on, so that said stock may be fed in proper position in the path of said cutters, said parts being arranged and operated substantially as shown and described.

2. The combination of the cutter-holding disk, the slitting-cutters, the separating-cutter, and the guide or support for the wood or other stock to be operated on, substantially as and for the purpose shown and set forth.

3. The cutter-holding disk provided with a circular boss or central projection, and the slitting and separating cutters arranged on said disk, as described, in combination with the guide having a ledge or shoulder, between which and the shoulder formed by the boss the stock may be pressed and held against the face of the disk in the path of said cutters, as shown and set forth.

4. The combination of the slitting and separating cutters with the cutter-holding disk, constructed in rear of the slitting-cutters with clearing-spaces, progressively increasing in size to accommodate the increasing thickness of shank, and a discharge opening or outlet in rear of the separating-cutter, substantially as shown and set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

WATSON N. SPRAGUE.

Witnesses:

WM. W. WEBSTER,  
J. M. WEBSTER.