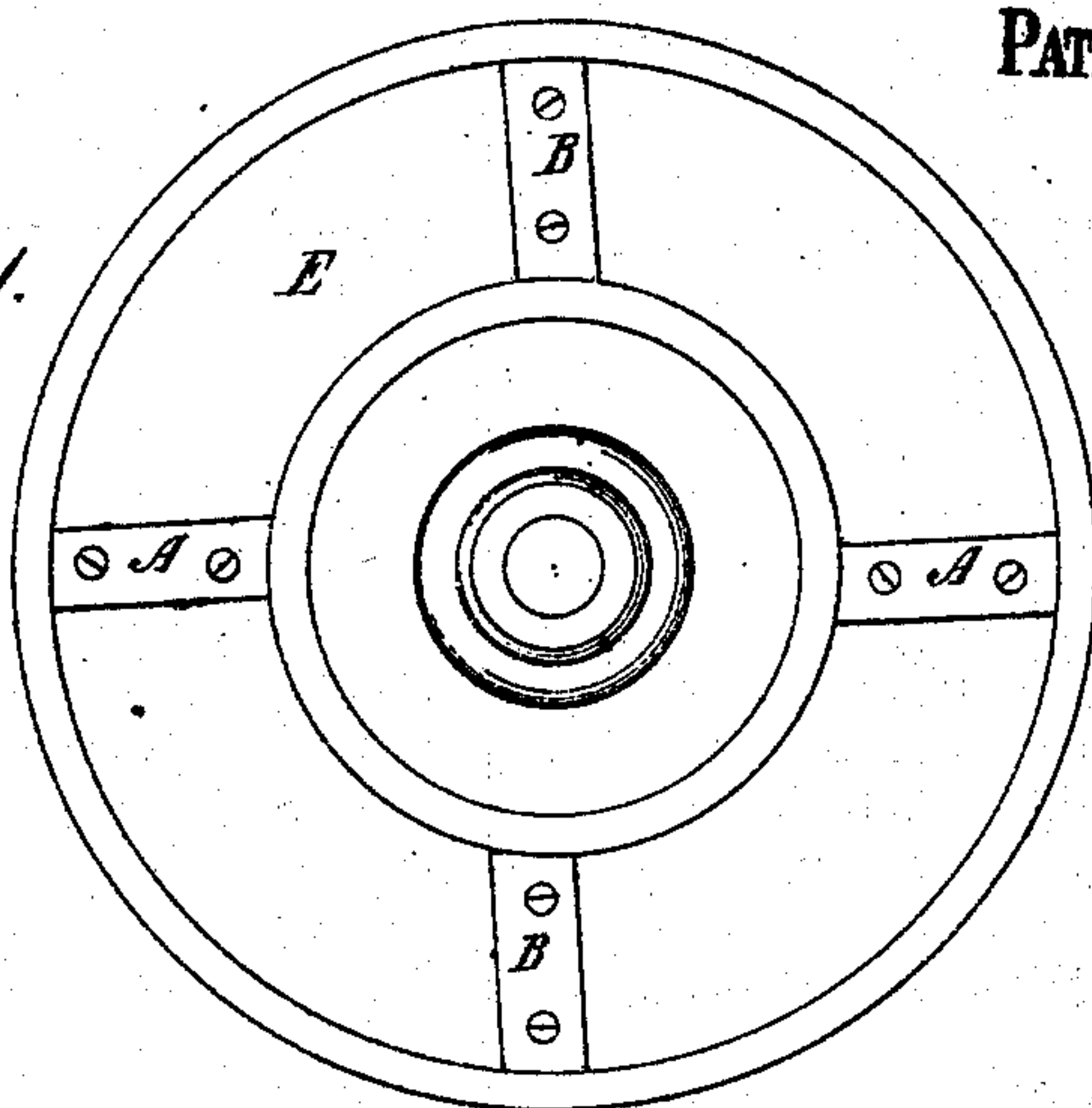


*A. W. Paull and John Morgan Jr.*  
*Nail-Machine.*

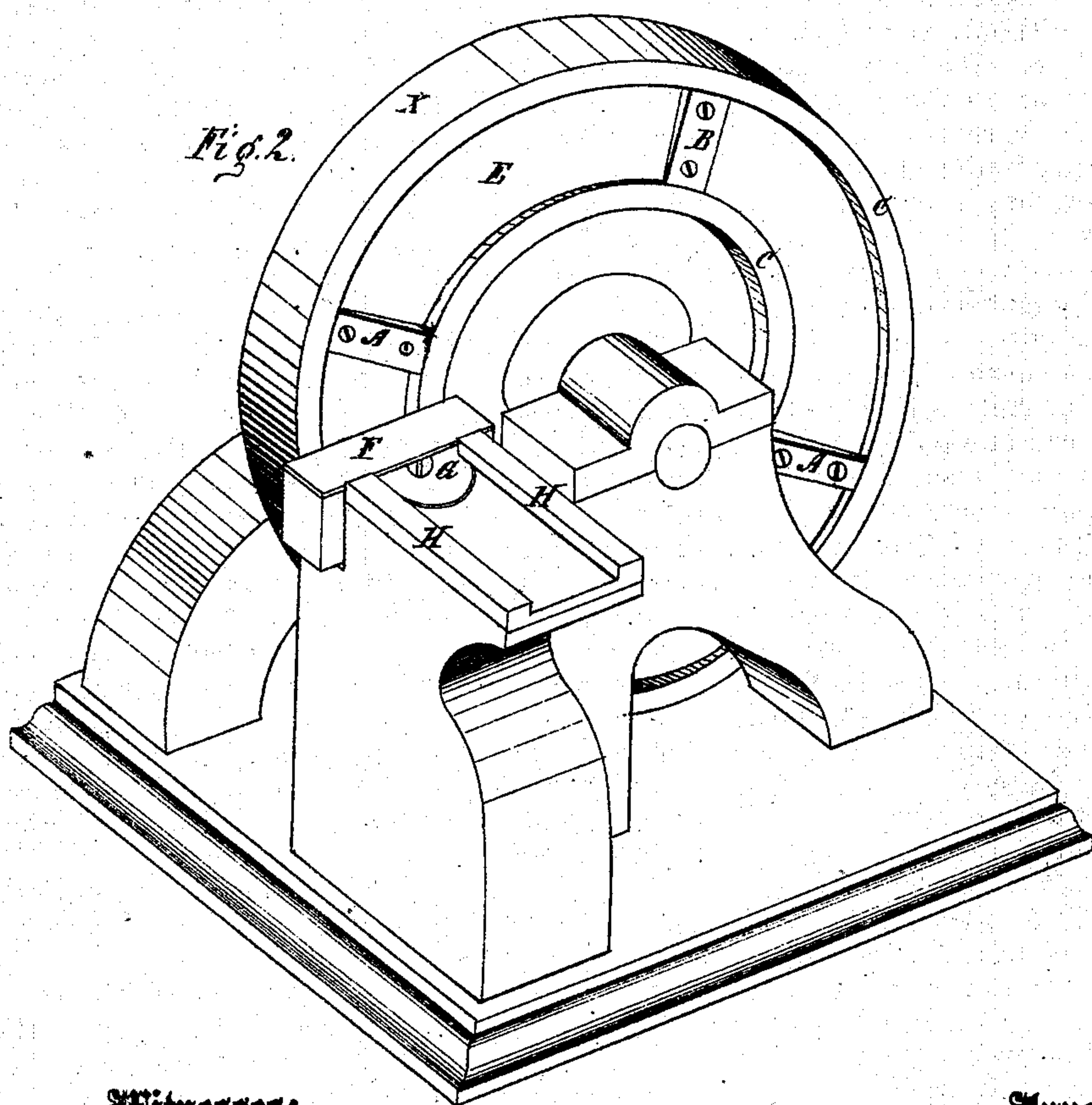
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*Fig. 1.*



*Fig. 2.*



Witnesses:

*H. J. Steet*  
*Thos. D. D. Curand*

Inventors:

*A. W. Paull.*  
*John Morgan Jr.*

PER

*Wm. V. C.*  
 Attorneys.



# UNITED STATES PATENT OFFICE.

ARCHIBALD W. PAULL AND JOHN MORGAN, JR., OF WHEELING, W. VA.

## IMPROVEMENT IN NAIL-MACHINES.

Specification forming part of Letters Patent No. 116,747, dated July 4, 1871.

*To all whom it may concern:*

Be it known that we, ARCHIBALD W. PAULL and JOHN MORGAN, Jr., of Wheeling, in the county of Ohio and State of West Virginia, have invented a new and Improved Nail-Machine; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification.

Our invention relates generally to machines for cutting nail-blanks, and particularly to that class of such machines as cuts off the blanks with rotary knives, and without turning or laterally moving the nail-plate. The improvement consists in the peculiar arrangement of the cutter-stock and the knives thereon with respect to the horizontally-vibrating under cutter.

Figure 1 of the drawing represents a side view of the cutter-stock with knives. Fig. 2 represents a perspective view of the cutter-stock and knives and the under cutter on its pivoted stock.

In Fig. 1, X is a cutter-stock, which may be solid, as shown, or consist of a hub and radial arms. It is placed at right angles to the vibrating cutter. A A form one pair or set of knives, with cutting-edges in the same vertical plane; and B B, another pair or set, whose edges are in the same vertical plane with each other. The cutting-edges of the two pairs of knives A B are, however, placed at an angle corresponding to the angle which is intended to characterize the shape of the cut blank. The knives are not placed with their edges on radiuses of the disk, but at an acute angle thereto, in order to give a shearing cut. C C are flanges, between which the knives are located upon seats or arms. They are cam-shaped, in order to regulate the position of the under cutter, and to support laterally the edges of the nail-plate to the extent that it projects beyond the stock of the under cutter. D D and E E are laterally and reversely-inclined surfaces between the flanges, to support firmly the nail-plate along its entire front edge. F is a laterally-vibrating cutter on the pivoted stock G. H H are guides, between which the nail-plate is fed up to the cutters.

The mode of operation is as follows: The nail-plate, being shaped at the end to conform to the desired inclination of one side of the intended blank, being placed between the guides H H, and being moved by a suitable feeding device, is borne with its front end against the correspondingly-shaped surface between the flanges C C.

Here it is firmly held while the knife comes down in a perpendicular plane and cuts it from the inner part of the disk outwardly. One blank being cut, the flanges shift the under cutter, and the inclination between the knives is also reversed to correspond to the change in the inclination of the front edge of the nail-plate. The same operation is repeated, and so on *ad infinitum*.

The advantages of this arrangement of the cutter-stock and cutters are as follows: The cutter-stroke thus obtained is a clean and perfect shear, because each knife, when passing the under cutter, travels in a perpendicular plane exactly parallel to the under cutter, and commences the incision at the point of greatest leverage, cutting outwardly like a pair of shears from the fulcrum or center of power. On the other hand, in ordinary machines of this class, the knives, being placed on the periphery, do not make a straight cut, but travel in a circle to which the under cutter is a tangent, and the incision is, therefore, a curve inward until it reaches the center of the plate, and then outward to the lower surface thereof. This gouging cut requires far more power to effect it, and necessitates a much more frequent sharpening of the knives than our straight-shearing cut. The leverage in these machines is obviously always the same, whether the knife is entering the metal or otherwise. It is, too, always at a minimum, because the disks of these periphery cutters must always be made as large as practicable, in order to make the arc described in the metal by the cut as small a fraction as possible of three hundred and sixty degrees, and, therefore, as near an approximation as possible to a straight cut.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The construction and combination, as herein described, of the rotary disk X with the concentric and cam-shaped flanges upon its side, the swivel cutters A B extending across from one flange to the other, and placed at angles relative to one another and to the radiuses of the disk, as described, and the oscillating anvil-cutter, for the purpose set forth.

ARCHIBALD W. PAULL.  
JOHN MORGAN, JR.

Witnesses:

F. M. INGRAM,  
GEO. GILLILAND.