(No Model.)

R. P. FRIST.

WASHER CUTTER.

No. 468,613. Patented Feb. 9, 1892.

Fig. 2.

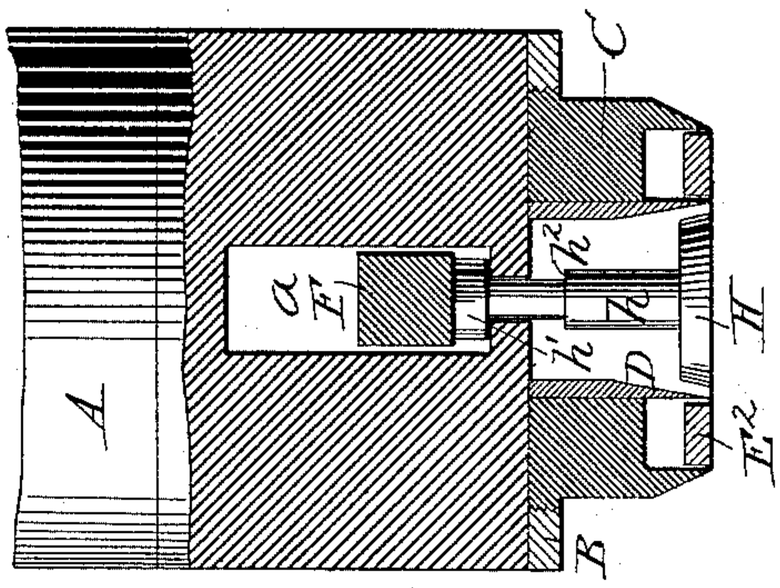


Fig. 3.

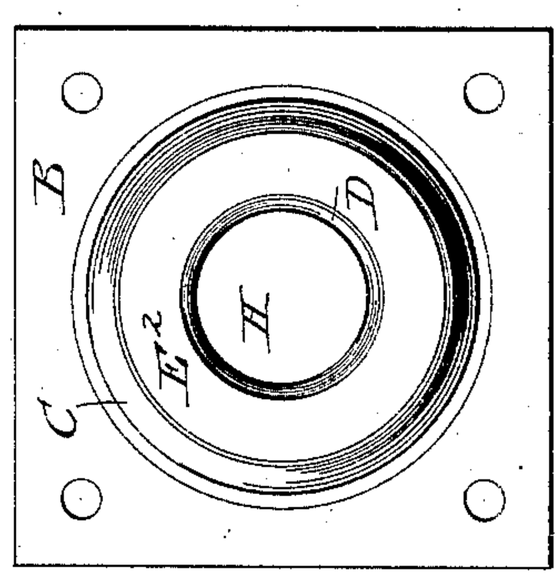
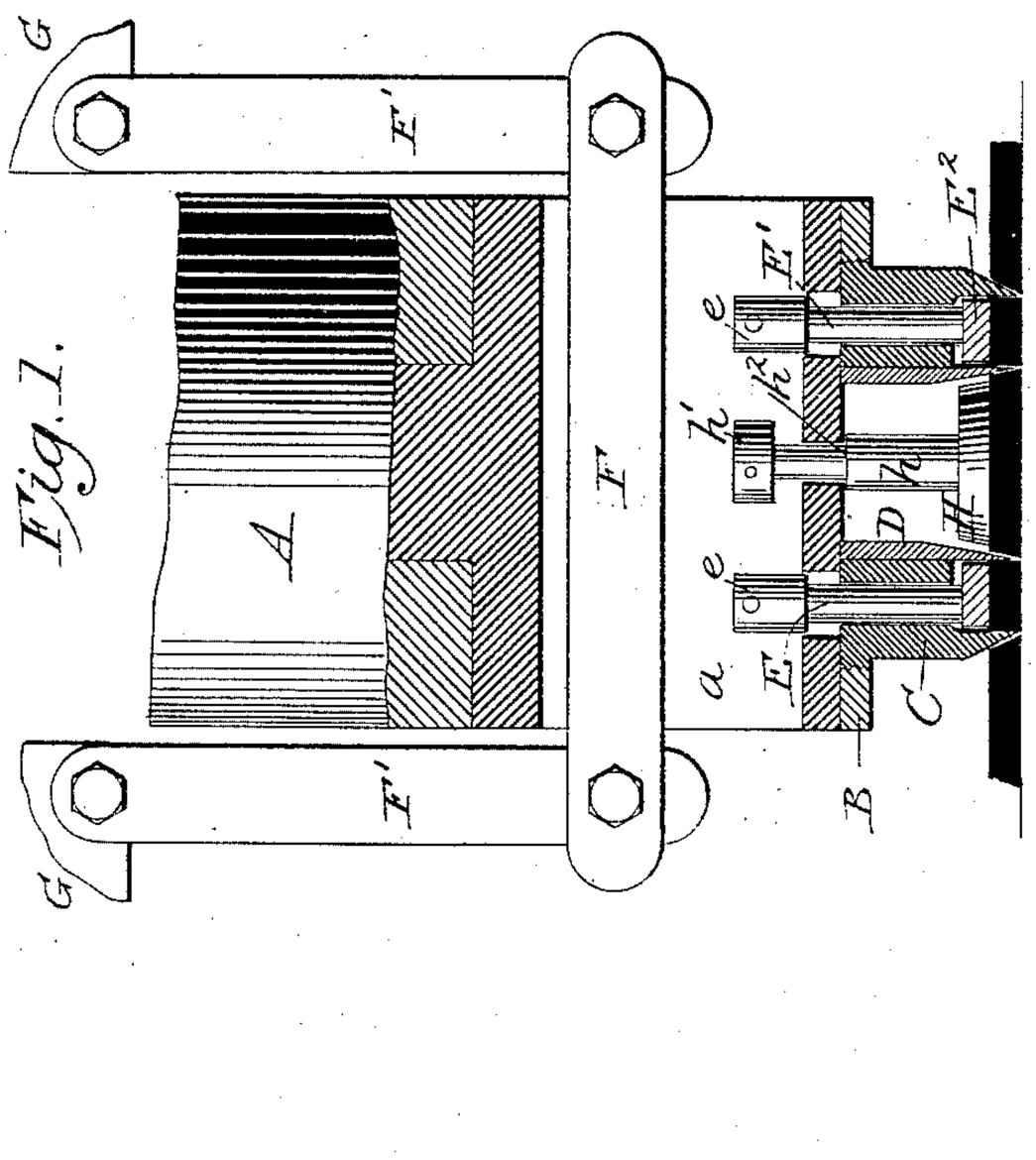


Fig. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROBERT PORTER FRIST, OF WILMINGTON, DELAWARE, ASSIGNOR TO THE DELAWARE HARD FIBRE COMPANY, OF SAME PLACE.

WASHER-CUTTER.

SPECIFICATION forming part of Letters Patent No. 468,613, dated February 9, 1892.

Application filed July 20, 1891. Serial No. 400,154. (No model.)

To all whom it may concern:

Be it known that I, ROBERT PORTER FRIST, a citizen of the United States, residing at Wilmington, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in Washer-Cutters, of which the following is a specification.

Application Serial No. 397,501, filed June 25, 1891, by Abednego Dewes and myself jointly, shows, describes, and claims a ring-washer cutter in which the central disk formed in the process of cutting the washer was discharged upward through the cutter-head. My present invention constitutes an improvement upon the apparatus therein shown by which the central disk is discharged in the same direction as the annular washer.

The subject-matter claimed is hereinafter specified. Unless otherwise indicated the parts are of usual approved construction.

The accompanying drawings represent so much only of the apparatus as is necessary to illustrate the subject-matter herein claimed, the parts corresponding with those of the application above mentioned being correspondingly lettered.

Figure 1 represents an elevation, partly in vertical central section, with the parts in the attitude assumed at the moment of cutting the washer. Fig. 2 is a similar view at right angles to Fig. 1, showing the relation of the parts at the moment of discharging the washer and central disk. Fig. 3 is a face view of the cutter-plate.

A reciprocating plunger A is shown as provided at bottom with a transverse slot *a*. A cutter-plate B, secured to the bottom of the plunger by screws or bolts, is recessed and screw-threaded to receive a circular cutter C, screwed therein. A central concentric cutter or punch D is likewise secured to this plate. The outer edges of both cutters, it will be observed, are flared or tapered slightly to facilitate the cutting and discharge of the washers. Clearing-rods E E′ are secured at bottom to an annular clearing-plate E^2, moving endwise in the space between the cutters C D. The clearing-rods E E′ extend up through guide-holes in the plate B and have heads *e* thereon to admit of the ready removal and replacement of the clearer and clearer-rods. These heads also traverse openings in the bottom of the punch, communicating with the transverse slot *a* above mentioned, and are provided with square shoulders, which abut against the cutter-plate to limit the outward movement of the clearer-plate, but when pressed inward by the cutting of the washer project into the slot, so as to be acted upon by a stationary clearer-bar F, passing therethrough and suspended by links F′ from a fixed portion G of the frame. A central clearer H inside the central punch is mounted on a stem *h*, projecting into the transverse slot *a* and carrying a shouldered head *h′*, like the other clearers. It is also provided with an internal shoulder h^2 below the punch, limiting its inward movement. The parts heretofore described, with the exception of this central clearer, are substantially similar to those of the pending application above mentioned, and the operation of the apparatus will readily be understood from the foregoing description.

Fig. 1 shows the cutters as having severed the washer. As the punch rises the clearer-heads abut against the clearer-bar F, which forces them down into the position shown in Fig. 2, thus discharging both the central disk and the ring-washer. This method of discharge is much better adapted to the manufacture of large washers than an apparatus in which the central disks are discharged through the punch or cutter-head.

Having thus described the construction, organization, and operation of my improved ring-washer cutter, what I claim therein as new and as of my own invention is—

The combination, substantially as hereinbefore set forth, of a reciprocating plunger provided with a transverse slot, concentric cutters carried by the plunger below the transverse slot, an annular clearer between the cutters, clearer-rods connected to the annular clearer and projecting into the transverse slot of the plunger, a central clearer having a clearer rod or stem projecting into the transverse slot and provided with a shoul-

der h^2 to limit its inward movement and having an enlarged lower end beveled or tapered, as described, to correspond with the tapered edge of the inner cutter, and a fixed bar in the transverse slot of the plunger, which intermittently engages with the clearer-rods, for the purpose specified.

In testimony whereof I have hereunto subscribed my name.

ROBERT PORTER FRIST.

Witnesses:
THOMAS GIFFIN,
HERMANN E. FRIST.