

(No Model.)

D. S. CLARK.
PAPER CUTTING MACHINE.

No. 462,469.

Patented Nov. 3, 1891.

Fig: 4.

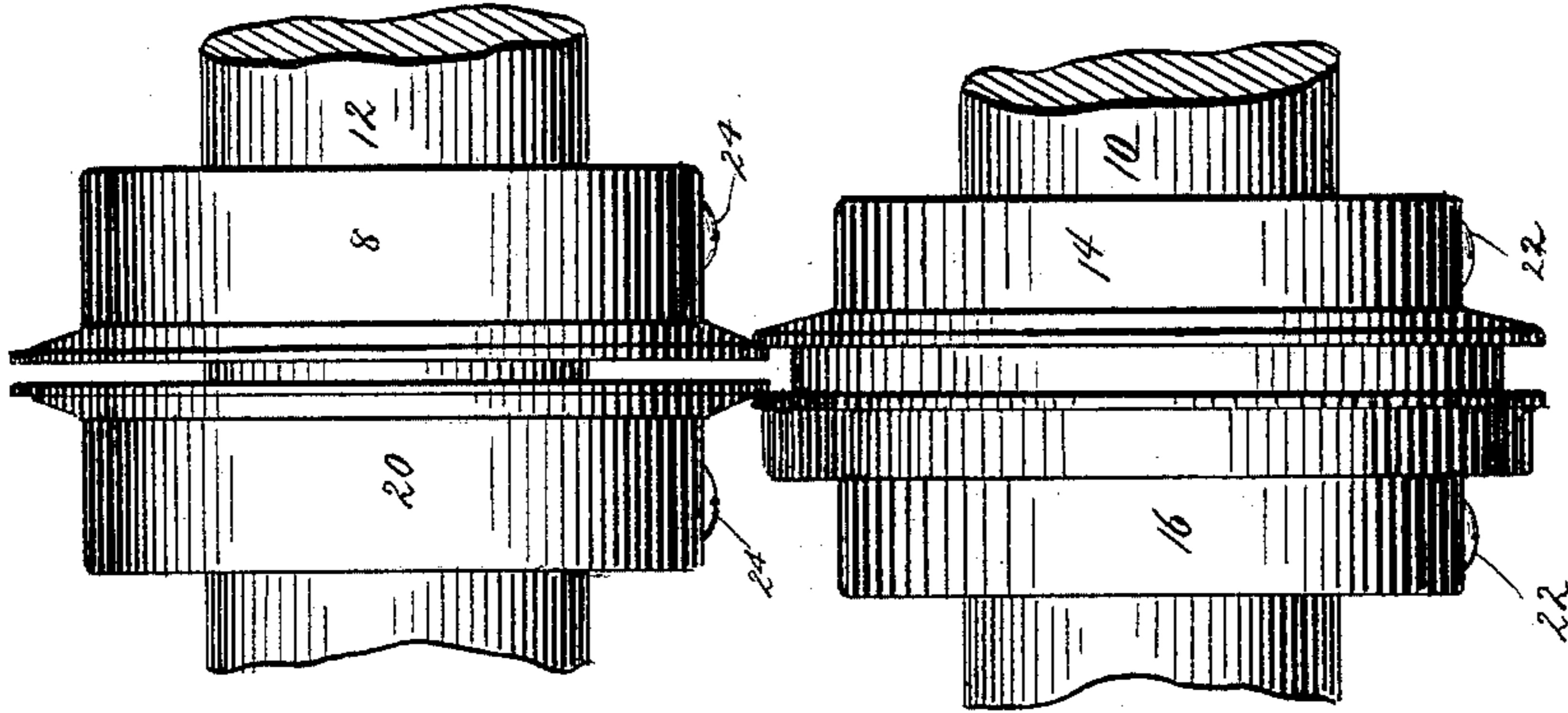


Fig: 3.

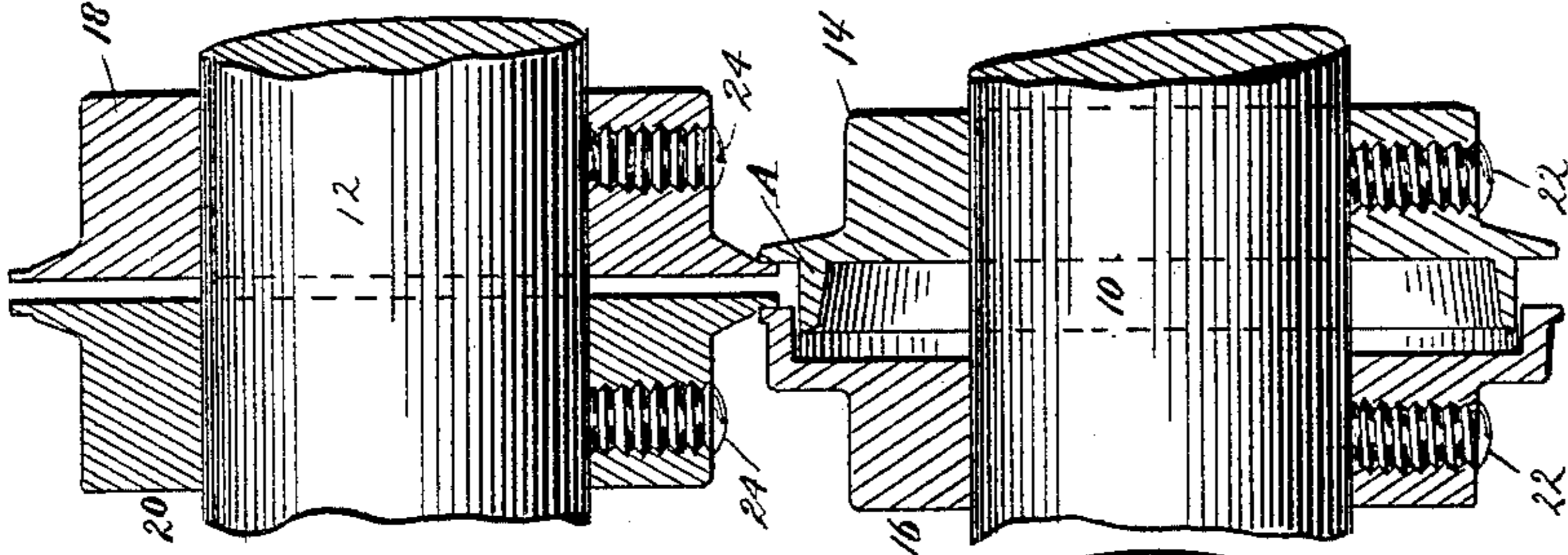


Fig: 2.

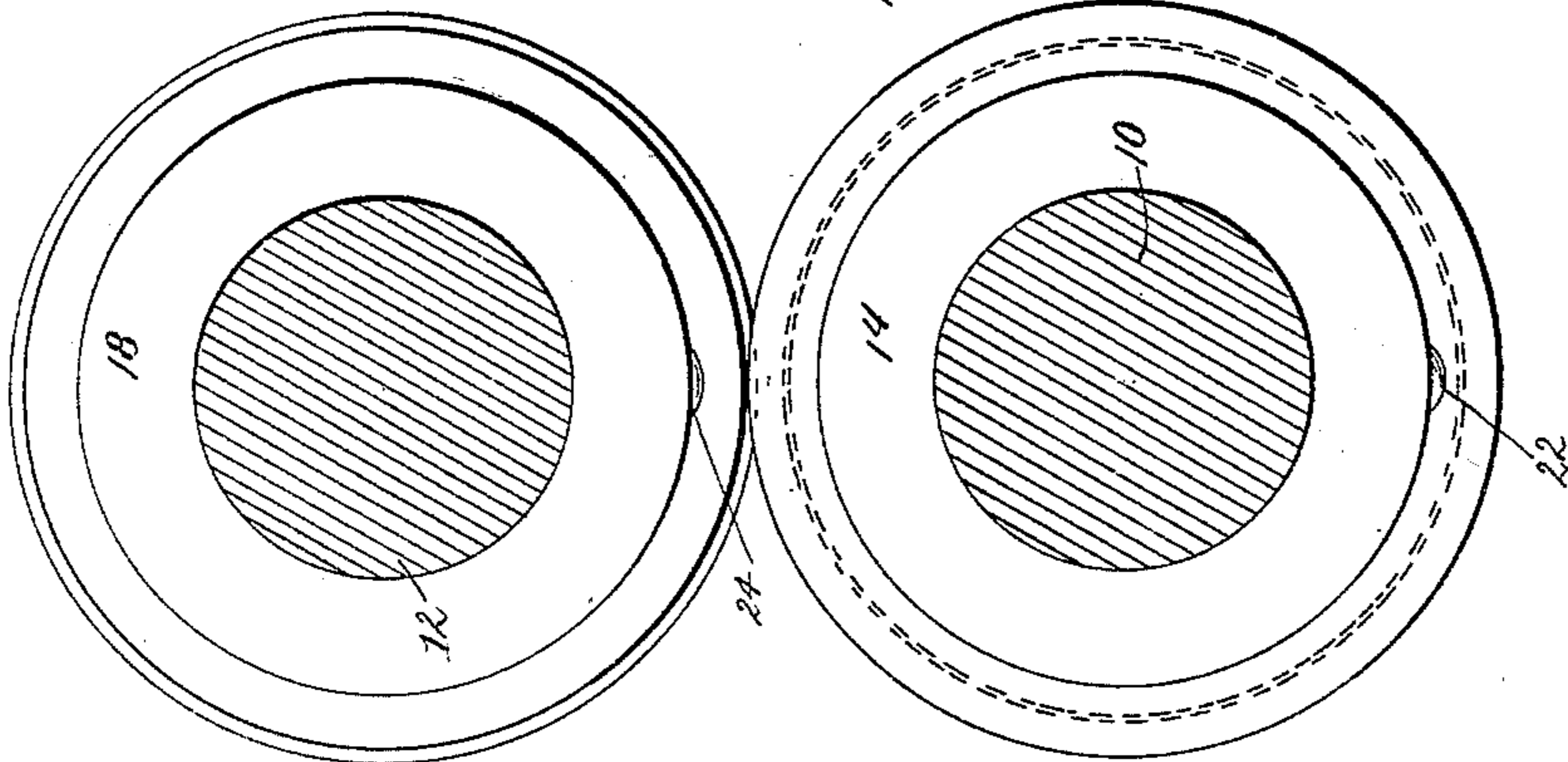
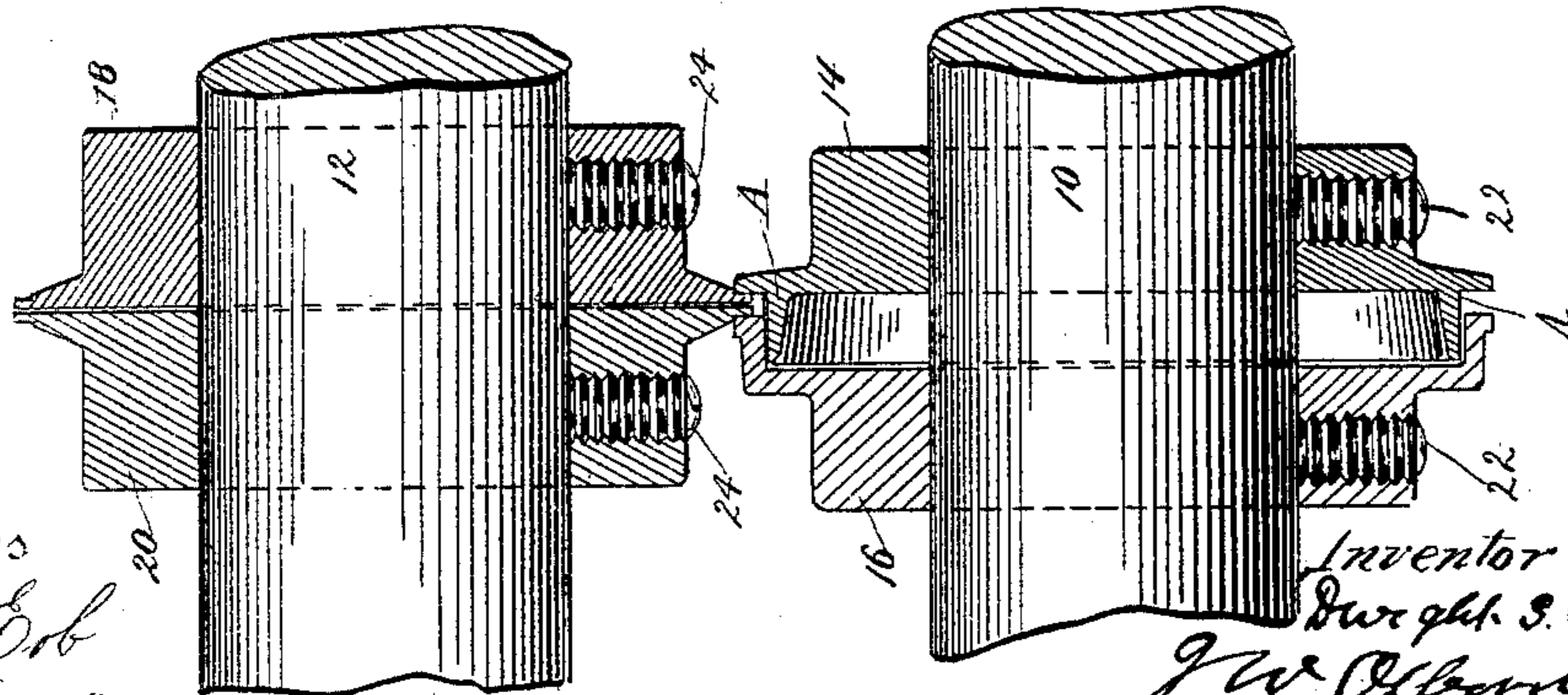


Fig: 1.



Witnesses
Arthur G. Erb
Leonard H. Dyer

Inventor
Dwight S. Clark
J. W. Osborne
Attorney

UNITED STATES PATENT OFFICE.

DWIGHT S. CLARK, OF CAMBRIDGE, ASSIGNOR TO EMMA L. FORBES, OF
BOSTON, MASSACHUSETTS.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 462,469, dated November 3, 1891.

Application filed June 12, 1891. Serial No. 396,056. (No model.)

To all whom it may concern:

Be it known that I, DWIGHT S. CLARK, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Paper-Cutting Machines, of which the following is a specification.

This invention is related to a number of devices used for dividing paper into sheets or strips, and it is especially connected with the class of rotary cutters.

Machines of this sort usually consist of two parallel shafts, one over the other, driven in opposite directions by power, each being provided with one or more disks of steel made fast upon them. These disks are of larger radius than half the distance between the shafts, and are fastened thereto in pairs in such a way that a disk on one shaft lies up against or very close to its felly on the other shaft and passes it for a short distance. The adjacent edges of the disk are sharp, and when a sheet of paper or card-board is pushed against them on the side where they roll toward each other it is immediately slit on a line coincident with the junction of the revolving disks. This is effected exactly as is the cutting in two of a piece of paper or sheet metal by a shears, one disk forcing the edge of one of the pieces down and the other disk forcing the adjacent edge of the other piece up, whereby the two are separated.

As at present constructed rotary cutters of the kind described work well under usual conditions, but when it is desirable to cut two lines very close together difficulties are met with at once. I overcome these difficulties by using a group of four disks constructed in a peculiar manner, which is fully shown in the drawings forming part of this specification.

In the drawings, Figures 1 and 3 show in section a group of the disks I employ, and Figs. 2 and 4 the same in elevation as seen from the side and from the end, respectively.

In the figures, 10 represents one of the parallel cutter-shafts which carry the disks, and 12 the other. The cutters in each complete set providing for two close cuts consist of two disks on each shaft, which are marked, respectively, 14 and 16 on shaft 10 and 20 and

18 on shaft 12. One of the former—that marked 16 in the drawings—has on its cutting side a depression of annular form, into which a corresponding projection on the other disk 14 fits with some accuracy. These two disks on the same shaft I call “complementary disks” or “cutters.” The projection just described may be solid, or, as shown in Figs. 1 and 3, it may consist of a projecting ring only. (Marked A in the drawings.) Said projection is of such a diameter as will allow the approach of the cutting-edges of the two duplicate disks 18 and 20 between the cutting-edges of 14 and 16 without the contact of the same with the cylindrical surface of the projection A. These two disks 18 and 20 are identical, the cutting-edge of each being on the outer side of its rim. In the position shown in Fig. 1 the disks 18 and 20 are as close together as they can be placed, and the same is true of 14 and 16. Under these circumstances two parallel lines will be cut in the paper which is passed between such engaging cutters as close together as the apparatus will allow; but as the set-screws 22 and 24 permit of the adjustment and firm clamping of all the cutters relatively to each other, the distance between the cut lines by separating the disks on each shaft can be increased, as is clearly shown in Figs. 3 and 4. This increase can be carried to the full length of the projection on 14 and even somewhat in excess of that length.

It should be explained that the function of the projection A is to throw out the narrow strip of material, which from its own weight would not fall from between two adjacent disks, as large strips of paper and card-board do. In using the rotary cutters I have invented, the end of an exceedingly narrow strip when first cut strikes or may strike against the convex cylindrical surface of the projection A and is thereby ejected upward. Otherwise—that is, in the absence of A—it would wedge itself between the disks and be entangled in the apparatus. The projection A therefore presents a deflecting surface should the narrow strip of paper tend inward toward the shaft, and keeps said fillet or strip out near the cutting-edges, where the centrifugal force is greatest.

As is common with all rotary cutters for slitting sheet material, the group hereinbefore described may be repeated on the parallel cutter-shafts as often as desirable. I also wish it understood that I do not limit myself to the particular forms given to the cutters, as they may be varied in well-known ways, nor in the way in which they are adjusted and fixed upon the cutter-shafts.

What I claim is—

1. A cutter-shaft carrying a pair of cutting-disks each having an adjacent cutting-edge, in combination with a parallel cutter-shaft bearing duplicate disks having external cutting-edges operatively engaged with and between the first pair and with an intervening ring concentrically placed between the first-named disks and adapted by its convex surface to eject the strip of sheet material cut between the same, substantially as described.

2. In a set of rotary cutters adapted to cut a narrow strip of sheet material, the combi-

nation, with the outside cutting-disks of the group, of a circular plate or ring interposed concentrically between the same and of diameter small enough to clear the entering cutting-disks, whereby the narrow strip of severed sheet material is thrown out, substantially as described.

3. A set of rotary cutters consisting of a pair of complementary cutting-disks on one of the cutter-shafts, which are adjustable with reference to each other, and two disks on the other cutter-shaft adjustable with reference to the cutting-edges of the first pair and arranged to engage with the same to cut and then to throw out a narrow parallel strip of material from any part of a sheet, substantially as described.

DWIGHT S. CLARK.

Witnesses:

FRANK S. HIGHT,
MAUDE E. STONE,
CHARLES D. ADAMS.