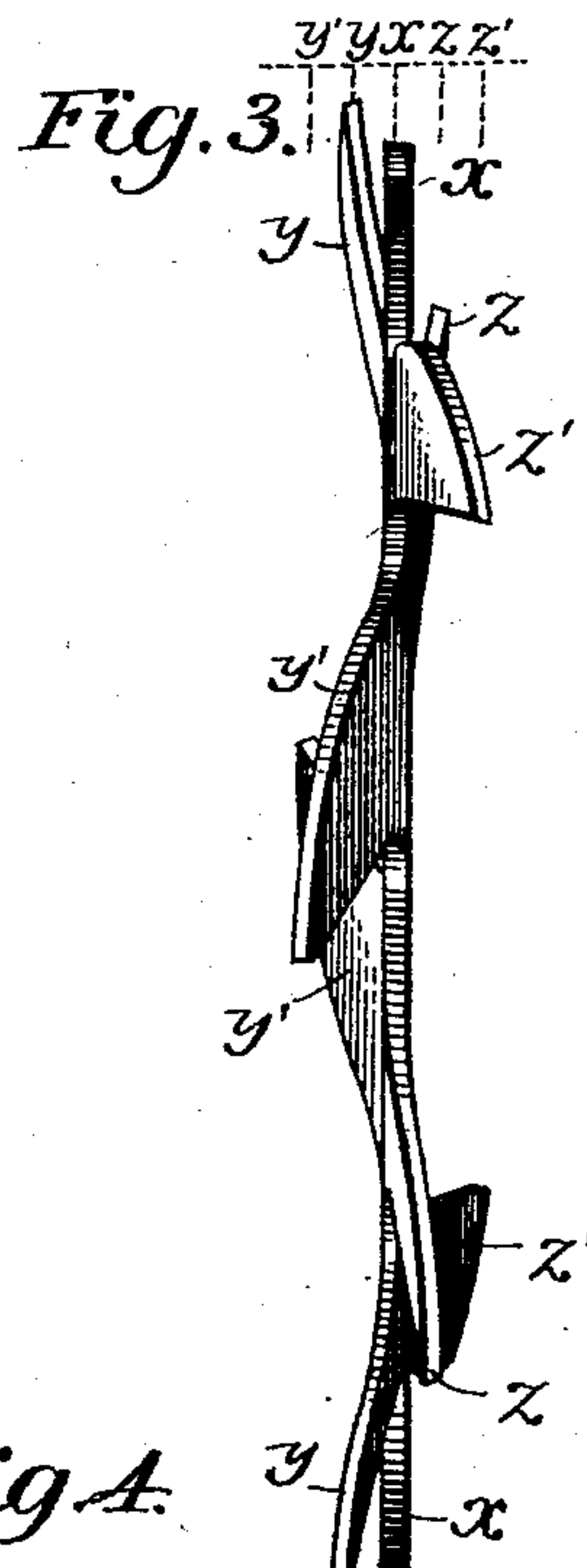
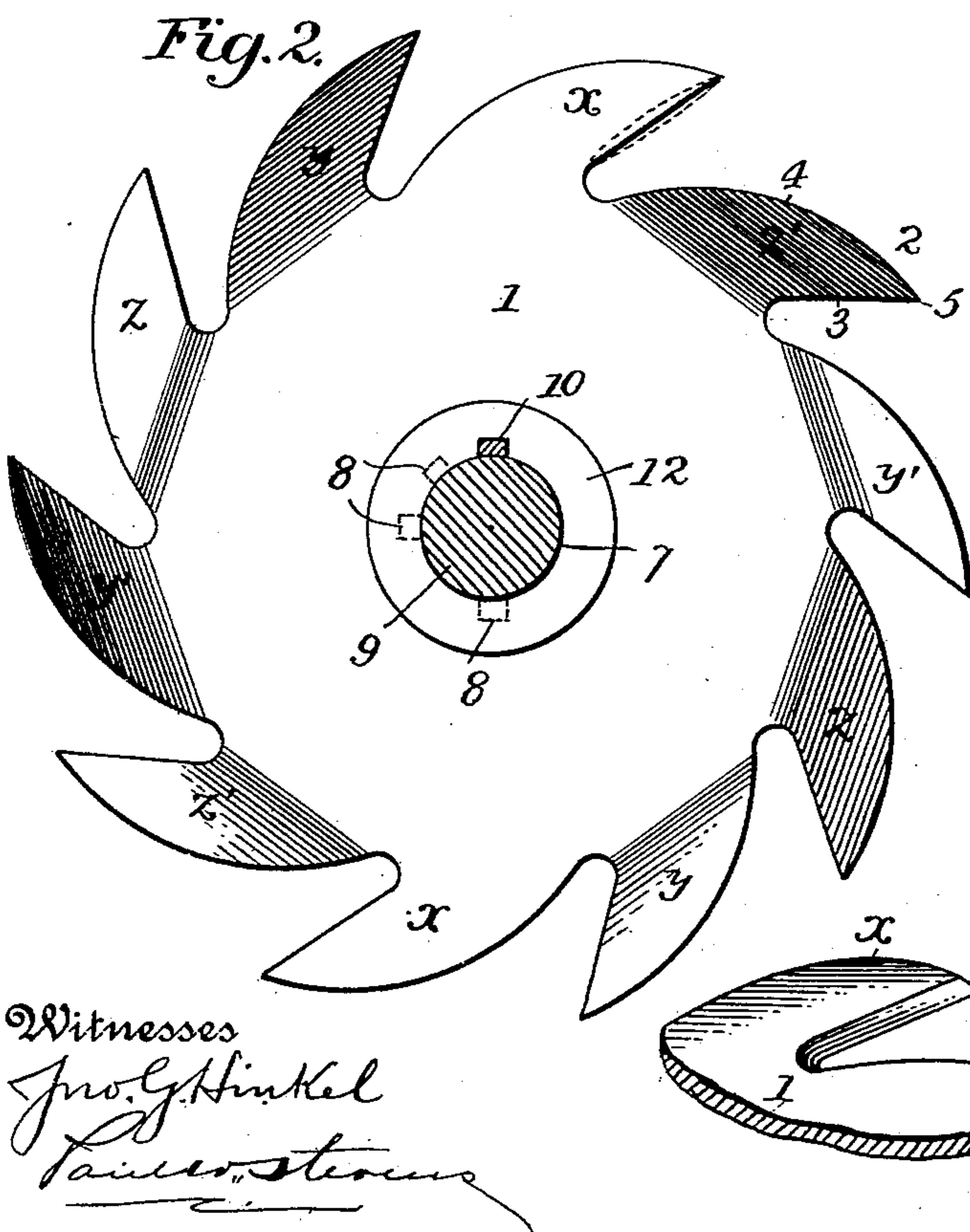
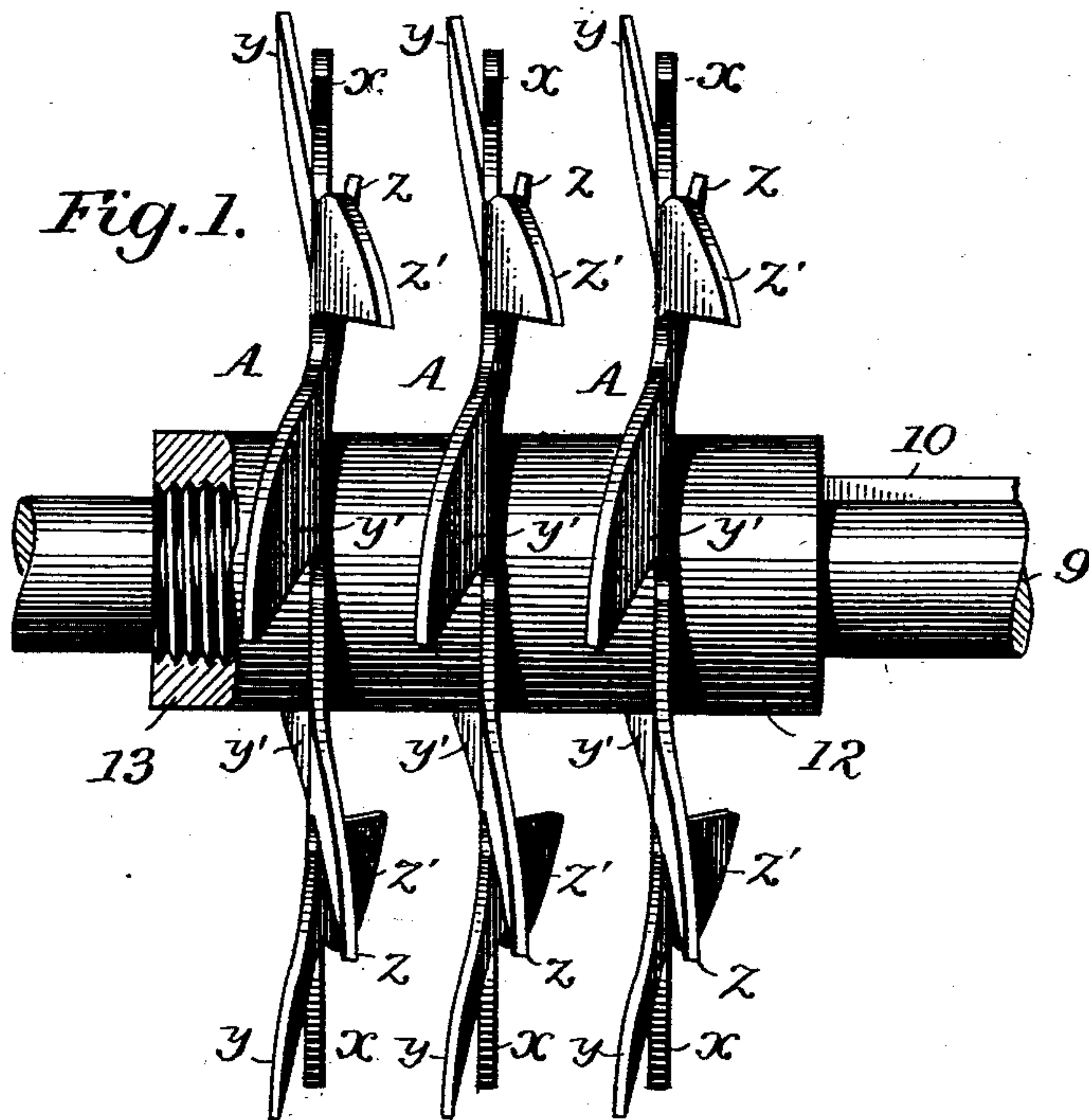


(No Model.)

J. D. TRACY.  
CIRCULAR CUTTER.

No. 570,828.

Patented Nov. 3, 1896.



*Fig. 4.*

Inventor  
John D. Tracy  
by *Forster & Freeman*  
Attorneys

Witnesses  
*Geo. G. Hinkel*  
*James Stearns*



# UNITED STATES PATENT OFFICE.

JOHN D. TRACY, OF STERLING, ILLINOIS.

## CIRCULAR CUTTER.

SPECIFICATION forming part of Letters Patent No. 570,828, dated November 3, 1896.

Application filed September 6, 1895. Serial No. 561,661. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN D. TRACY, a citizen of the United States, residing at Sterling, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Circular Cutters, of which the following is a specification.

My invention relates to circular cutters adapted more especially for use in connection with machines for shredding, cutting, or comminuting fodder and similar materials; and it has for its object to provide an improved and more efficient cutter; and to these ends it consists in a cutter having the features of construction substantially as more particularly hereinafter set forth.

Referring to the accompanying drawings, Figure 1 is a front elevation of a section of a cutter-shaft with a series of cutters mounted thereon. Fig. 2 is a side elevation of one of the cutters. Fig. 3 is a front elevation, and Fig. 4 is a detail perspective view of a modification.

The cutters, which are duplicates of each other, are made of any suitable material, but preferably of steel or similar metal, and are stamped, cut, or otherwise formed in any desired manner. The cutter A comprises, essentially, a body portion 1, provided at its periphery with a series of projecting teeth 2. These teeth may be of any desired contour, but, as shown, their inner edges 3 are straight and are at an angle to the radii of the cutter, while their outer edges 4 are curved, and these two edges converge to form the points 5 of the teeth. The edges of the cutter-teeth are formed flat, as shown in Figs. 1 and 3, but they may be sharpened upon one or both edges, as illustrated in Fig. 4, and while the edges 3 are preferably formed straight they may be either concave or convex, as indicated in dotted lines, Fig. 2, and these and other details of construction may be varied to suit the wishes of the user for the purposes for which the cutters are used.

One of the essential features of my invention consists in the arrangement of the cutter-teeth 2, and it will be seen that some of the teeth are arranged in lines or in a plane with the body portion of the cutter, while others are bent to one side or the other of the plane of the cutter-body, extending at differ-

ent angles thereto, so that their cutting edges or points are in different planes, which planes are parallel to the plane of the cutter-body. As shown, the teeth are spaced equidistantly and are in two series, each series being a duplicate of the other and each series occupying one-half of the circumference of the body portion of the cutter. In some instances, however, more especially in cutters of larger diameter, the number of series of teeth may be increased, as well as the number of teeth in each series; but each series will occupy an integral portion of the circumference of the cutter-body, and the teeth are arranged in substantially the same relation to each other in each series. In the present instance there are five teeth in each series, the teeth of each series being lettered, respectively,  $x y z y' z'$ , and the teeth of the corresponding shape or position are arranged opposite each other in pairs. Thus the teeth  $x x$  project in a straight line or plane from the periphery of the body portion of the cutter on diametrically opposite sides thereof. The teeth  $y y$  project at an angle to the face of said body portion on diametrically opposite sides thereof, but in the same direction, so that their points are in a plane parallel to the plane of the body portion. The teeth  $z z$  project at an angle to the opposite face of said body portion on diametrically opposite sides thereof, so that their points are in a plane parallel to the plane of the body portion, but on the side opposite from the teeth  $y$ . The teeth  $y' y'$  project at a greater angle to the body portion of the cutter than the teeth  $y y$ , but in the same direction, so that their points are in a plane parallel to but at a greater distance from the plane of the body portion than the teeth  $y y$ , and the teeth  $z' z'$  project at an angle from the body portion in the same direction as the teeth  $z$ , but to a greater extent, so that their points are in a plane parallel to but at a greater distance from the plane of the body portion than the teeth  $z$ . The planes of the teeth  $y y z z$  are preferably midway between the planes of the body portion and of the points of the teeth  $y' y' z' z'$ , respectively, and these planes are indicated by the dotted lines, Fig. 3, having letters corresponding to the teeth.

It will thus be seen that the point of each tooth of each series rotates in its own indi-



vidual plane and that all these planes are parallel to each other, so that the cutting or shredding action will be in lines or planes parallel with the motion of the cutter.

5 In the arrangement of the cutter-teeth around the periphery of the body portion of the cutter, as shown in the drawings, the tooth  $x$  of one series is diametrically opposite the  
10 the tooth  $y$  of one series is opposite the tooth  $y'$  in the other series, and both the teeth  $y$  project on the same side of the cutter, while the teeth  $z$  are diametrically opposite each other and both project on the same side of the cut-  
15 ter, but on the side opposite from the teeth  $y$ . The same is true of the relative relations of the teeth  $y'$  and  $z'$ , and the same would be true of the other teeth of the series if there were more employed, and in this way I in-  
20 sure a perfectly-balanced cutter, which will make a series of cuts, the central one being in the plane of the body portion of the cutter and the others in a plane to one side or the other thereof, and in this way all tendency  
25 to crowd the material being operated upon is avoided. These cutters may be mounted or supported in any desirable manner, and I have indicated in Fig. 1 one way of arranging them, there being a shaft 9, having a feather  
30 10, fitting a recess 8 in the central opening 7 of the cutter, and interposed between the cutters are blocks or separators 12, and all are held together in any suitable way, as by a screw-threaded nut 13. In this figure it will  
35 be seen that the cutters are arranged at equal distances from each other and all the teeth  $x$  are in substantially the same radial plane, and this is the preferred arrangement; but it is evident that, if desired, the cutters can be  
40 arranged in different relations to each other and the straight teeth  $x$  may be in different radial planes, there being a number of recesses 8 formed in the opening 7, to permit the cutters to be thus arranged. This cutter-  
45 head, with the cutters, may be used in connection with any ordinary or desired form of machine and I have not deemed it necessary to show herein such a machine.

50 From the above it will be seen that my improved cutter-head can be readily made and that it possesses great advantage over the ordinary cutter-heads heretofore used, and while I have illustrated and described the preferred embodiment it will be evident that

the details of construction and arrangement 55 of parts may be varied by those skilled in the art without departing from the spirit of my invention.

What I claim is—

1. A circular cutter comprising a body por- 60 tion and a number of series of teeth arranged around the periphery thereof, a portion of the teeth of each series extending in the plane of the cutter-body and other teeth of each series extending alternately on opposite sides of said 65 plane, substantially as described.

2. A circular cutter, comprising a body por- 70 tion and a number of series of teeth arranged around the periphery thereof, a portion of the teeth of each series extending in the plane of the body portion of the cutter, and other teeth of each series extending alternately upon op- 75 posite sides of and at different distances from said plane, substantially as described.

3. A circular cutter, comprising a body por- 80 tion and a number of series of teeth arranged around the periphery thereof, a portion of the teeth of each series extending in the plane of the body portion of the cutter, while others extend alternately upon opposite sides of and 85 at different distances from said plane, the distances between the planes of the points of said teeth being equal, substantially as described.

4. A circular cutter, comprising a body por- 90 tion and a number of series of teeth arranged around the periphery thereof, a portion of the teeth of each series extending in the plane of the body portion of the cutter, and others extending alternately on opposite sides of and 95 at different distances from said plane, the teeth of one series being arranged diametrically opposite the similar teeth of the other series, substantially as described.

5. A circular cutter, comprising a body por- 100 tion provided at its periphery with a successively-recurring series of teeth, a portion of the teeth of each series extending in the plane of the cutter-body, while others extend alternately upon opposite sides of and at different 105 distances from said plane, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN D. TRACY.

Witnesses:

W. A. BROWN,  
N. R. ROUND.