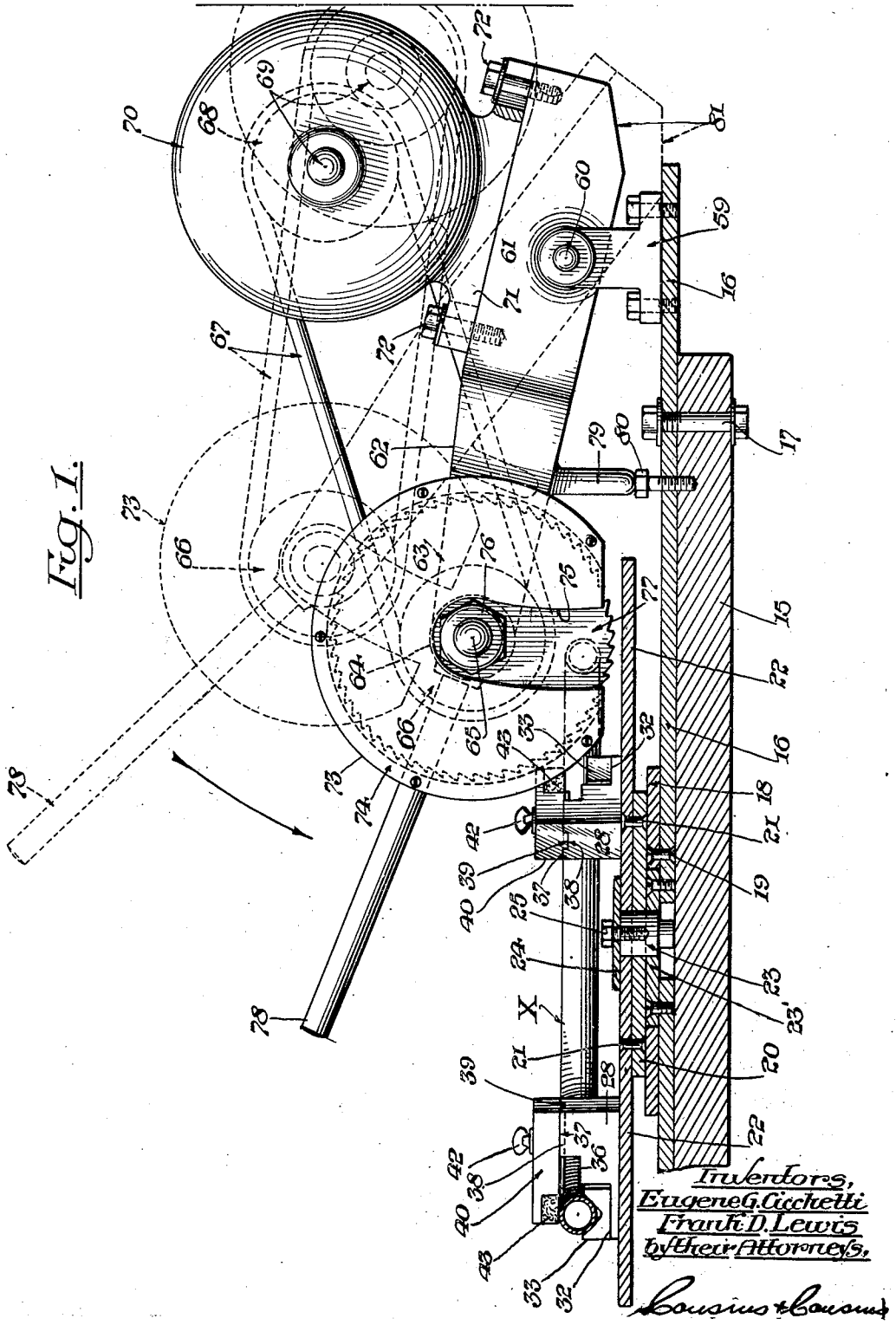
May 1, 1945. E. G. CICCHETTI ET AL 2,374,806

TUBE SEVERING MACHINE

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Fig. 1.



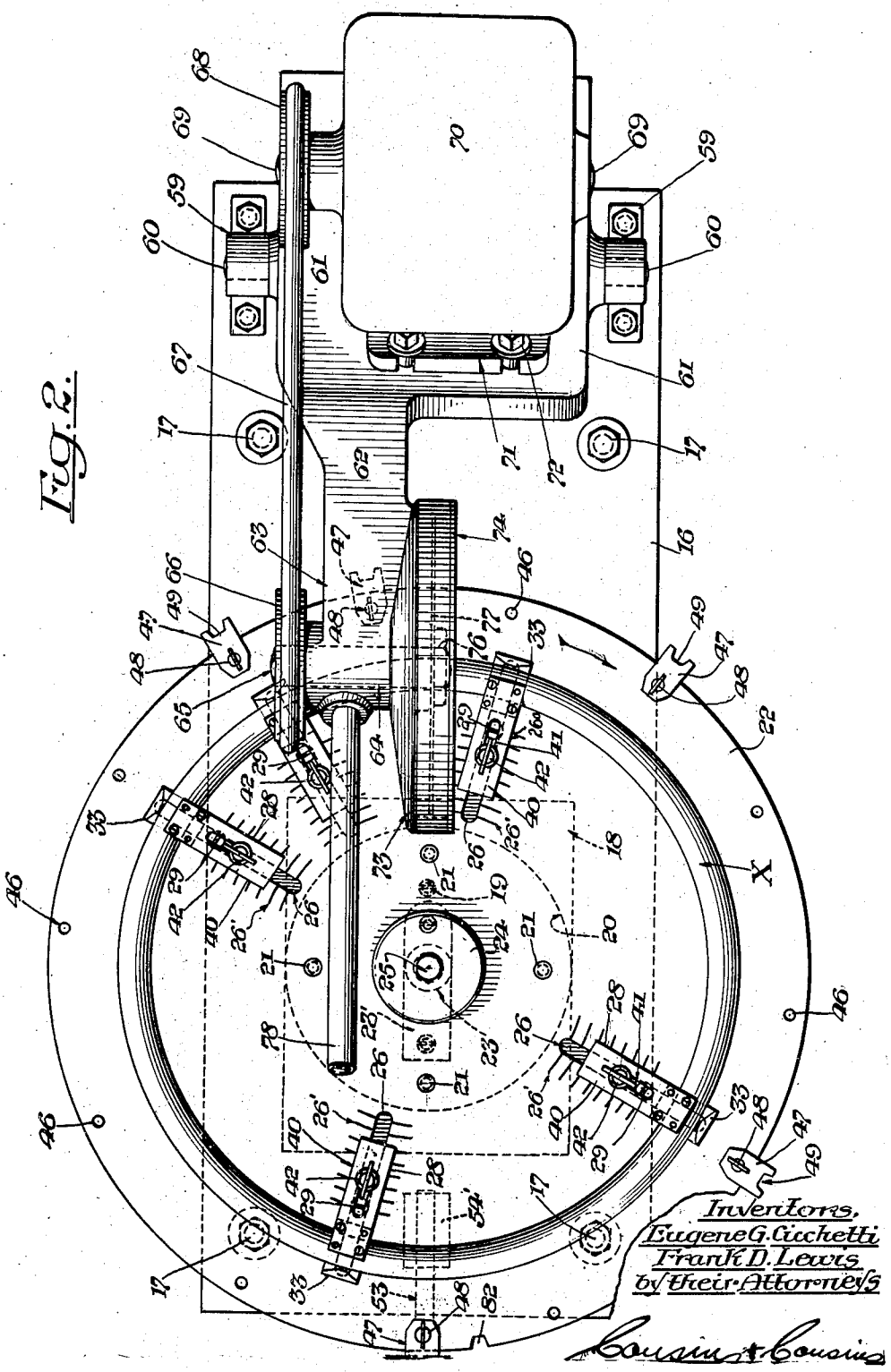
Inventors,
Eugene G. Cicchetti
Frank D. Lewis
by their Attorneys,
Cousins & Cousins

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Fig. 2.



Inventors,
Eugene G. Cicchetti
Frank D. Lewis
by their Attorneys
Cousins & Cousins

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TUBE SEVERING MACHINE

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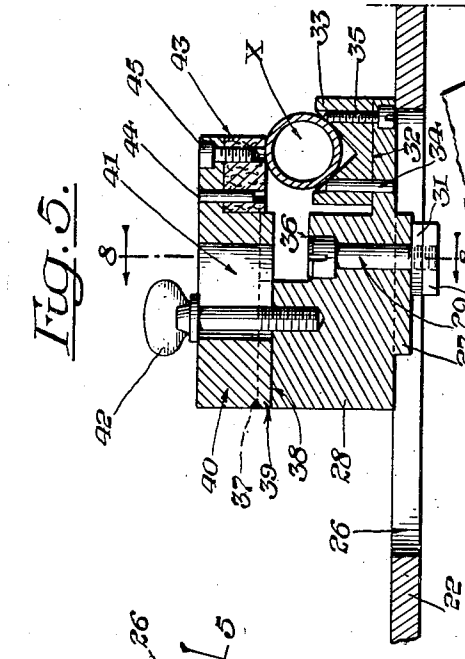


Fig. 5.

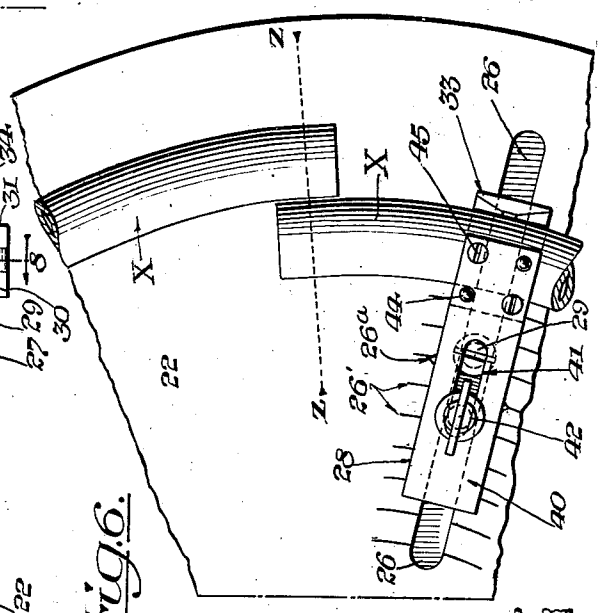


Fig. 6.

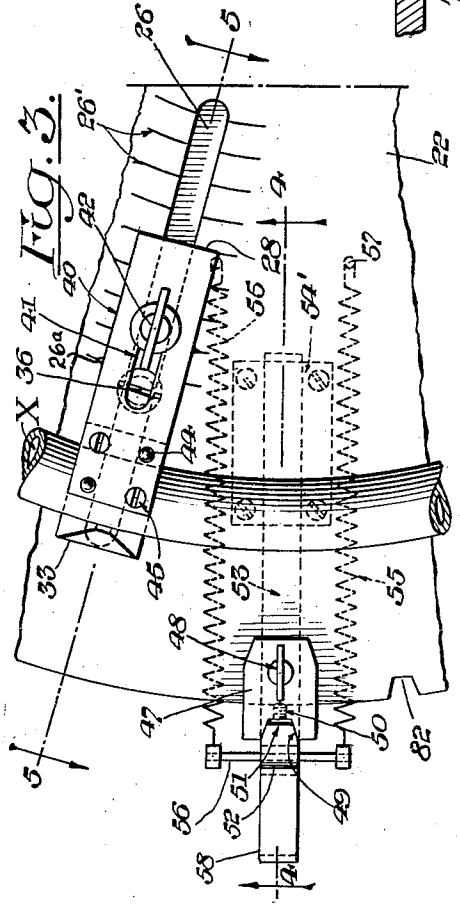


Fig. 3.

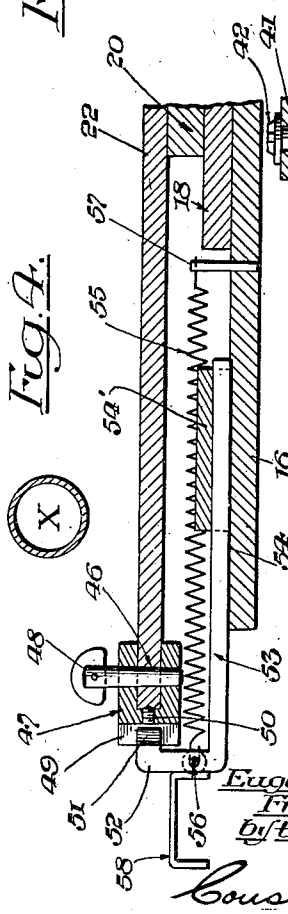


Fig. 4.

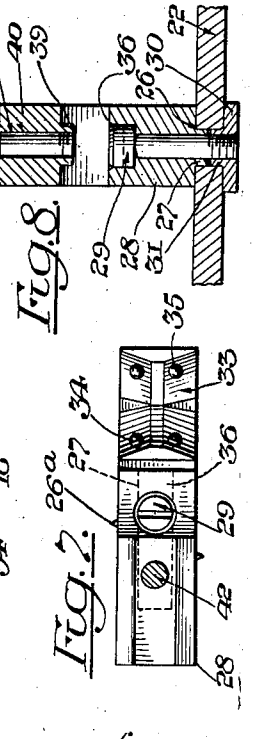


Fig. 8.

Fig. 7.

Inventors,
Eugene G. Cicchetti
Frank D. Lewis
by their Attorneys,
Cousins & Cousins

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UNITED STATES PATENT OFFICE

2,374,806

TUBE SEVERING MACHINE

Eugene G. Cicchetti, Bronx, N. Y., and Frank D. Lewis, West Orange, N. J., assignors to Breeze Corporations, Inc., Newark, N. J., a corporation of New Jersey

Application February 18, 1944, Serial No. 522,988

3 Claims. (Cl. 29—69)

This invention relates to machines for severing into segments ring-like objects, of circular cross-section, such as tubes, rods and the like.

An object of the invention is to provide mechanism including a turn-table on which circular objects, of different radii and unlike diameters, may be clamped, thereafter being subjected to the action of a cutter whereby segments of any required length are produced, their ends being radial with respect to their axes.

A further feature is in the provision of a turn-table adapted for manual rotation, and provided with indices for each differently diametered object whereby duplicate segments of each varying radius may be produced.

Another purpose is to produce efficient clamping means for such objects, so devised as to avoid malformation and also surface impairment.

These and other analogous objects, which will become apparent as the disclosure progresses, are accomplished by the novel construction, combination and arrangement of parts hereinafter described, and illustrated in the accompanying drawings, constituting a graphical component of this disclosure, and in which:

Figure 1 is a side elevational view of an embodiment of the invention, partly in section.

Figure 2 is a top plan view of the same.

Figure 3 is a fragmentary plan view of the turn-table, detent and tube clamping means.

Figure 4 is a transverse sectional view, taken on line 4—4 of Figure 3.

Figure 5 is a similar sectional view, taken on line 5—5 of Figure 3.

Figure 6 is a top plan view of the parts shown in Figure 5.

Figure 7 is a plan view of an adjustable support for a tube.

Figure 8 is a sectional view, taken on line 8—8 of Figure 5.

Referring in greater detail to the drawings, the machine will be seen to consist of a support 15 on which is secured an elongated rectangular plate base 16, as by bolts 17, having near its front end a rectangular plate 18 held rigidly on its upper surface by flush headed rivets 19.

Seated on the surface of the plate 18 is a circular washer 20 fixed by rivets 21 to the under side of a turn-table 22, of amply large diameter, concentric therewith, both being axially mounted to rotate on a shoulder stud 23, fixed in a socket plate 23' set adjustably in the plate 18 on the base 16 and confined by a washer 24 through which passes a screw 25 set centrally in the stud, thus providing means for shifting the mechanism lengthwise of the base.

The turn-table is provided with a plurality of radial slots 26, arranged in predetermined relation, to receive keys 27 projecting from the bottoms of adjustable work supports 28, and also the bodies of clamp bolts 29 threaded into nuts 30 guided and prevented from turning by reason of their upper, narrowed key-like portions 31 engaging in the slots 26; the upper face of turn-table 22 is provided with marginal graduations 26' by which the supports may be set at varying distances from the axis of the plate to accommodate rings of unlike diameter, each support 28 being provided with an index 26a co-operative with the graduations.

These supports have three steps on their upper surface, the lowermost 32 consisting of a seat for V blocks 33, having beveled contacting surfaces for rings of varying diameters, and held in position by dowel pins 34 and screws 35; the intermediate step 36 is counterbored to receive the head of the clamp bolts 29, and the uppermost step 37 has a longitudinal groove 38 to slidably receive a key-like tongue 39 formed on the bottom of a clamp bar 40.

The bar 40 contains a longitudinal slot 41 through which passes a wing-headed clamp screw 42, threaded into the step 37, acting as a limit stop for the movement of the clamp bar, in addition to drawing it downwardly.

At the front end of the clamp bar 40, in its under side, is a recess to contain a pad 43 of non-metallic material, as indurated fiber, rawhide or the like, to avoid abrasion of the work part X with which it comes in contact, and may be of any required thickness. The block is interchangeably held in position by a dowel pin 44 and screws 45, blocks of different thicknesses being provided to clamp tubes of different diameters.

In order to accurately locate the position of the turn-table 22, with respect to the work to be done, a plurality of tapered holes are formed through it, uniformly distanced inwardly from its peripheral edge and precisely spaced apart in accordance with variable, but known requirements.

A series of stop gages 47 are bifurcated at their inner portions to fit closely around the edge of the turn-table and provided with tapered openings in both forks to receive correspondingly tapered, wing-headed pins 48, which pass through selected holes 46 in the turn-table, positively locating the gages.

In the opposite, outer end portion of the gage 47 is a bevel sided, open recess 49 formed trans-

versely therethrough, centrally of its width. In the bottom of the recess is a set screw 50, its point impinging on the periphery of the turn-table, binding the gage firmly thereto, in set position.

A detent 51 is shaped to engage in any of the recesses 49, and is formed on the upright stem 52 of a horizontal bar 53, slidable in a trackway 54 fixed on the base 16, provided with a removable cover plate 54', and biased into engagement by tension springs 55, having their outer ends engaged with the ends of a rod 56 passing through the stem, while their inner ends are anchored to pins 57 set in the base 16; a handle element 58 is provided to retract the detent.

On the rear portion of the base 16 are bolted spaced-apart brackets 59, their raised portions constituting bearings receptive of pintles 60 extending outwardly from the pad 61 of a frame 62 having a forwardly reaching arm 63 shaped to present a transverse bearing 64 for a spindle 65.

A pulley 66 is fixed on the outer end of the spindle, over which is trained a belt 67 leading from a drive pulley 68 on the shaft 69 of an electric motor 70, its base 71 being adjustably connected by bolts 72 to the frame 62.

A guard 73 is fixed on the front portion of the frame, covered by a removable face plate 74, having an arcuate slot 75, its radius corresponding with the axis of the pintles 60; a nut 76 holds a metal-cutting, circular saw 77 on the spindle 65. The saw is freely revoluble concentrically within the guard 73 and in direct alinement with the center of the fixture, over the point where cutting is to be done, as at Z—Z in Figure 6.

A lever-like handle bar 78, set in the front of the frame 62, provides manual means for tilting the saw and its frame relative to the work, as best indicated in Figure 1.

A stop lug 79, carried by the frame 63, limits the downward movement of the saw by coming in contact with the head of an adjustable stop screw 80 set in the base 15 of the machine, while the upward movement of the saw is limited by the beveled rear end 81 of the frame 63 contacting the base plate 16.

When using the machine an operator consults a table showing the settings of the stop gages 47, the work supports 28 and pads 43 approximate for cutting a tube of given radius and external diameter.

The selected pads 43 being secured, the work supports 28 are adjusted radially until the indexes 26a are positioned opposite the proper graduations 26', and secured by the clamp bolts 29.

The stop gages 47 are set in their correct position by inserting the pins 48 in the proper holes 46, whereupon the turn-table is rotated into its initial position, indicated when the detent 41 enters a notch 82 in the edge of the table.

The tube X is clamped in the V blocks 33 with its ends overlapping, as shown in Figure 6, under the saw 73, now raised, as indicated by the broken lines in Figure 1, and the clamp screws 42 tightened to retain the tube securely. Upon lowering the handle 78 the saw is brought into contact with the tube, cutting it along line Z—Z, Figure 6, severing the short end pieces, leaving the tube a full circle of 360 degrees when its ends are sprung into alinement.

After raising the saw, the turn-table is rotated until the detent 51 enters the recess 49 of the stop gage 47, as shown in Figure 3, thus locking the turn-table for a second cut of the tube by the saw.

This second cut may be for a short piece, for example, 10 degrees angular extent from the tube; the turn-table may then be rotated clockwise, as seen in Figure 2, until another stop gage is in position opposite the detent 51, which is released to lock the turn-table.

The saw may be lowered again, cutting the remaining tube into two parts, one of substantially 55 degrees and the other of 295 degrees angular extent; the several parts of the severed tube are removed in an obvious manner.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States, is:

1. A machine for severing rings into segments of predetermined length, comprising a bed having a vertical spindle, a turn-table rotatable on said spindle, said turn-table having a plurality of radial slots, support blocks adjustably guided in the slots, said blocks having V-shaped recesses, clamps movable over said recesses, said clamps being adjustable in thickness, means for locking said blocks in selected positions to accommodate rings of varying diameters, means to press said clamps against the rings, and a circular saw arranged to swing over and upon a ring on said turn-table thereby to cut the same into arcuate segments of predetermined length.

2. In combination with a turn-table having work holding means thereon, a plurality of gage blocks bifurcated to fit the peripheral edge of said turn-table, pins passing through said turn-table and both forks of said blocks, each block having a groove in its outer end, a spring-drawn dog engageable in the groove of either block, means to guide said dog in a radial path, and means to manually retract said dog.

3. A machine for severing rings into segments of predetermined lengths, comprising a rotatable turn-table provided with a plurality of spaced apart apertures disposed near its periphery, a plurality of stop gages having pins adapted to enter any of said apertures, a stationary frame, a detent mounted on said frame and adapted to be brought into engagement with said stop gages selectively to lock said turn-table in position, blocks adjustable along the upper face of the turn-table and arranged to support the rings and a saw arranged to cut the rings into segments.

EUGENE G. CICCHETTI.
FRANK D. LEWIS.