

June 29, 1937.

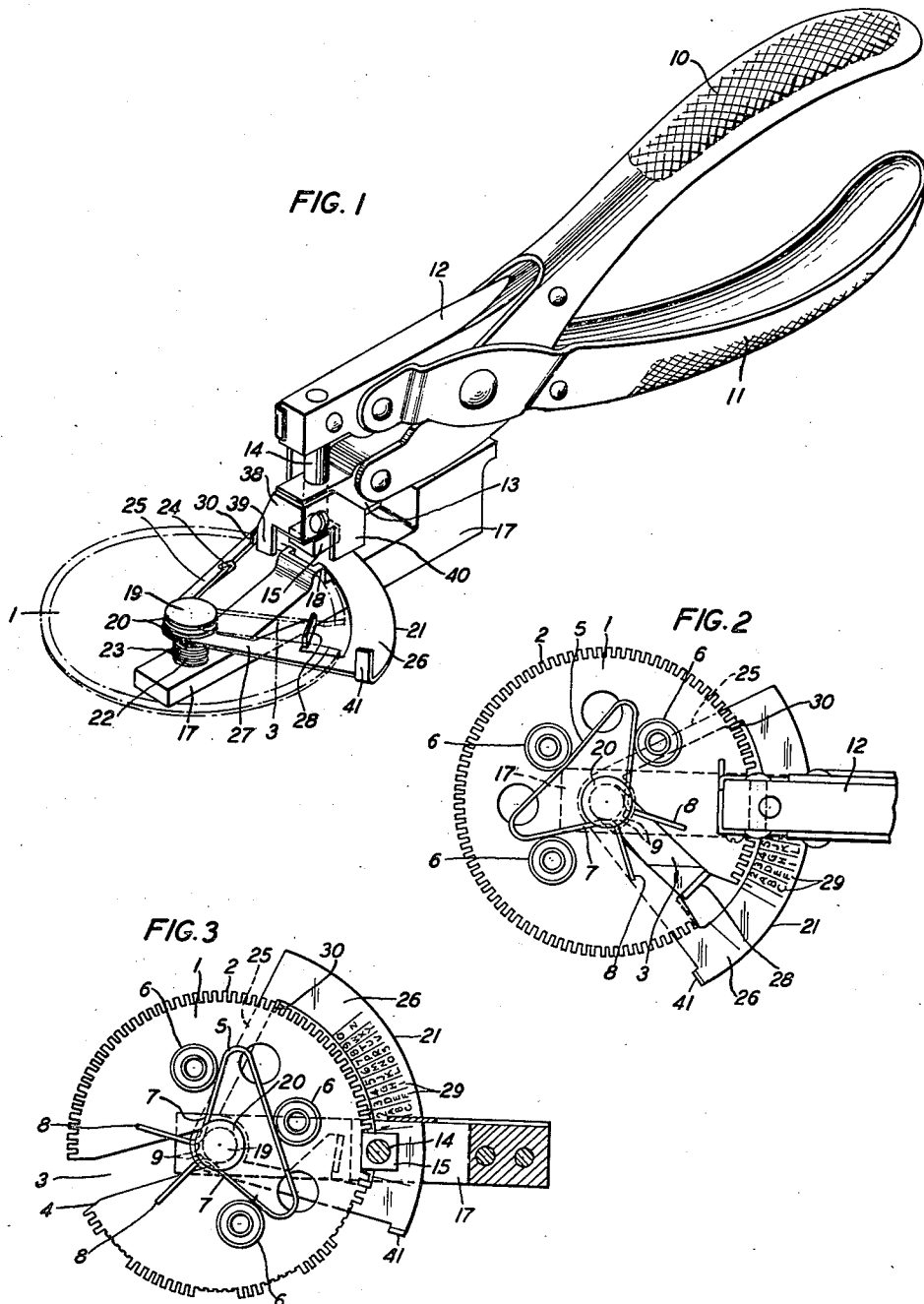
H. BROADWELL

2,085,079

CUTTING DEVICE

Filed June 19, 1936

3 Sheets-Sheet 1



INVENTOR
H. BROADWELL
BY *J. MacDonald*
ATTORNEY

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3 Sheets-Sheet 2

FIG. 4

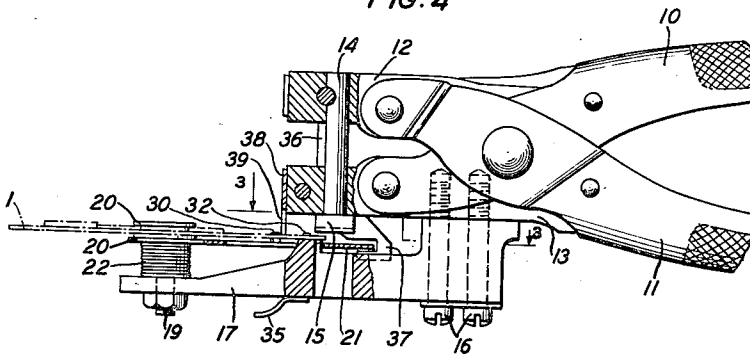


FIG. 5

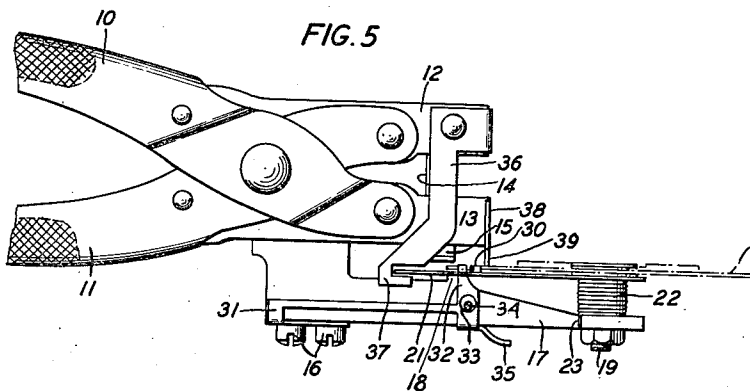
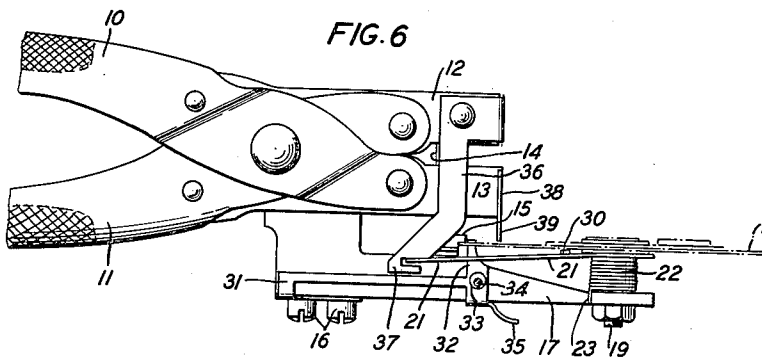


FIG. 6



INVENTOR
H. BROADWELL
BY *J. Mac Donald*
ATTORNEY

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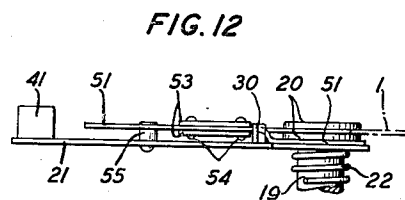
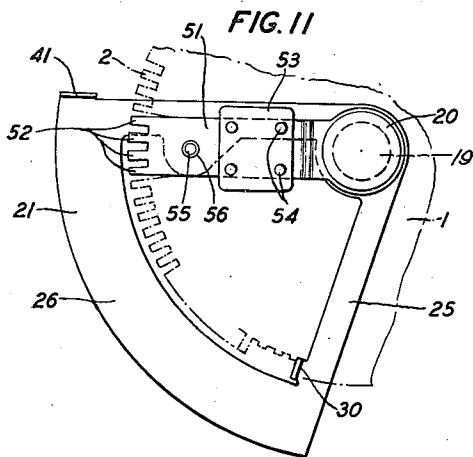
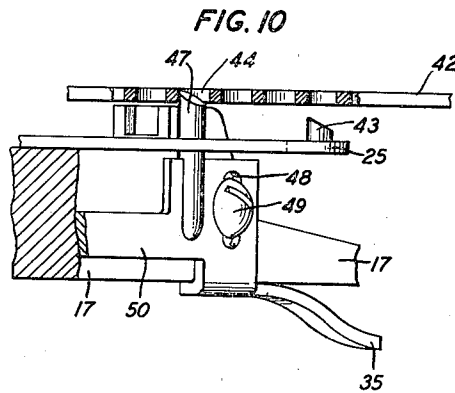
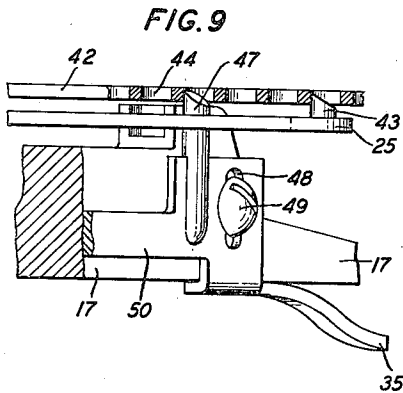
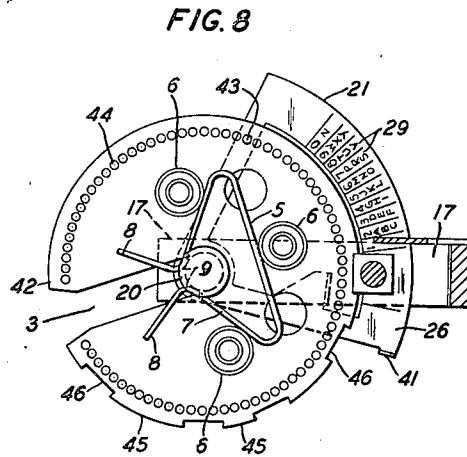
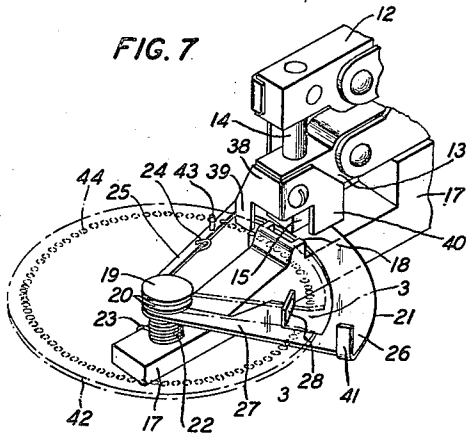
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3 Sheets-Sheet 3



INVENTOR
H. BROADWELL
BY *J. Mac Donald*
ATTORNEY

UNITED STATES PATENT OFFICE

2,085,079

CUTTING DEVICE

Howard Broadwell, Ridgewood, N. J., assignor
to Bell Telephone Laboratories, Incorporated,
New York, N. Y., a corporation of New York

Application June 19, 1936, Serial No. 86,060

6 Claims. (Cl. 164—121)

This invention relates to cutting devices and more particularly to a cutting device for cutting notches in a disc.

To facilitate the establishing of telephone calls to frequently called stations, repertory dialing devices have been devised for use at telephone stations. In some of the repertory dialing devices a code disc for each frequently called station is provided. A plurality of the code discs are mounted on a common shaft and the shaft and code discs are rotated through the operation of suitable driving mechanism. Means are provided so that a subscriber may make a call simply by selecting a required code disc and by starting the driving mechanism of the repertory dialing device.

The object of this invention is to provide a cutting device for cutting the code discs of such repertory dialing devices, which will eliminate all necessity of translating the subscriber's codes from a series of letters and numbers into a single series of numbers and counting off these numbers with the required interdigital spacing and individually breaking off or removing the teeth in the form where teeth are used.

A feature of the invention resides in means in the cutting device for positioning a code disc relative to a cutter in the device.

In the drawings, Fig. 1 is a view in perspective of the cutting device with a disc ready to be cut, the disc being shown in outline;

Fig. 2 is a top plan view of the disc and a portion of the cutting device, the disc having been moved to a first position for cutting;

Fig. 3 is a view similar to Fig. 2 but showing the disc after several cuts have been made;

Fig. 4 is a side elevational view, partly in section, of the disc and a portion of the cutting device;

Fig. 5 is a view similar to Fig. 4 but taken from the opposite side of the device relative to Fig. 4;

Fig. 6 is a view of the same side of the device shown in Fig. 5 but with the jaws and the operating parts of the device moved to a cutting position;

Fig. 7 is a view in perspective of a modification of the device, the code disc being of somewhat different form to that shown in Figs. 1 to 6, inclusive, and a portion of the modified cutting device being shown;

Fig. 8 is a top plan view, partly in section, of the modification shown in Fig. 7 and after several cuts have been made in the disc;

Fig. 9 is a view in perspective and partly in section of a portion of the modification shown in Fig.

7 and shown in somewhat reverse position relative to Fig. 7;

Fig. 10 is a view similar to Fig. 9 but showing some of the parts moved to different positions;

Fig. 11 is a top plan view of portions of the apparatus shown in Figs. 1 to 6, inclusive, and including an appliance for the cutting device; and

Fig. 12 is a side elevational view of the portion of the structure shown in Fig. 11.

In Figs. 1 to 6, inclusive, and in Figs. 11 and 12 the code disc 1 is a comparatively thin disc which may be made of sheet brass or other sheet material having sufficient stiffness and wearing qualities to serve as a code disc. Teeth 2 as shown in Figs. 2, 3 and 11 are provided on the peripheral edge of the disc 1, the teeth being all of the same dimensions and being separated by equal spacings. A portion of the disc 1 is cut out to provide a radial slot 3, the slot 3 being comparatively wide and extending from the periphery of the disc 1 inwardly to a point slightly beyond the axial center of the disc. The radial slot 3 is of sufficient width to accommodate a driven shaft of a repertory dialing device, not shown, and the outer end of the radial slot 3 is widened at 4 to permit ready placement of the disc 1 on the driven shaft of the repertory dialing device.

A spring 5 is provided on one face of the disc 1, the spring being removably held in place thereon by means of spaced cups 6 secured to the face of the disc 1. The spring 5 has movable leg portions 7 extending over the inner end portion of the radial slot 3 and bent back so that the free ends 8 lie over the face of the disc 1. The bent portions 9, 9 of the spring 5 are displaceable and are moved away from each other when the disc 1 is being applied to a shaft of a repertory dialing device or to the cutting device and will spring back to normal position when the disc 1 has been placed on the shaft or in the cutting device. The spring 5, therefore, serves to hold the disc 1 in a required position on the shaft of the repertory dialing device or in the cutting device and will prevent accidental dislodgment of the disc 1 from its required position.

To make the disc 1 suitable for operating in the repertory dialing device, to send a required code signal, some of the teeth 2 on the periphery of the disc 1 are removed or shortened at predetermined spaced points thus leaving, on the periphery of the disc, blocks of teeth at spaced intervals and notches separating the blocks of teeth. The notches are made by removing or shortening the teeth at the required predetermined points and these notches represent and

provide the interdigital pauses between the digit signals in the code. For instance, if a contact controlling member in a signalling system is controlled by means of the code disc 1 and is only permitted to send signals when the contact controlling member is riding on the teeth 2 of the code disc any portions of the code disc where the teeth 2 have been removed or shortened will cause cessation of the signals.

To shorten or remove the teeth 2 at required predetermined points on a code disc 1 and thus obtain a code disc suitable for use in the repertory dialing device a disc 1 having its full equipment of teeth 2 is placed in the cutting device as shown in Figs. 1 and 2 and blocks of teeth 2 at predetermined points are removed or portions of the teeth are cut off by the cutting device.

The cutting device is a hand-operated tool similar to a well-known type of hand-operated paper punch comprising handle members 10 and 11 and a pair of parallel operating jaw members 12 and 13. Secured in the upper jaw 12 and extending downwardly through a guide hole in the lower jaw 13 is a plunger 14 on the lower end of which is a cutter 15. The cutter 15 is of rectangular shape and of sufficient length to cut off a predetermined number of teeth in one shearing operation. Secured to the lower jaw 13 by means of the screws 16, 16 is an L-shaped steel bar 17 that extends parallel to and outwardly beyond the lower jaw 13. A raised portion 18 is provided on the upper surface of the steel bar 17 and in line with the cutting edge of the cutter 15 and a sharp edge is formed on the raised portion 18 to cooperate with the cutting edge of the cutter 15. When the handles 10, 11 of the cutting device are moved toward each other, the cutter 15 moves past the sharpened edge of the raised portion 18 and any portions of teeth 2 of a code disc 1 caught therebetween are sheared off.

To hold a code disc 1 in position in the cutting device a stud 19 is provided on the steel arm 17. The stud 19 extends upwardly from the free end of the steel arm 17 to a point slightly above the level of the upper surface of the raised portion 18 and has two spaced flanges 20, 20 formed on its upper end. The diameter of the stud 19 between the spaced flanges 20, 20 is the same as the diameter of the driven shaft of a repertory dialing device and is therefore adapted to receive the radially slotted portion 3 of the code disc 1.

Rotatably mounted on the stud 19 directly below the lowermost flange 20 on the stud is an indexing segment 21 for moving the code disc 1 to required positions for cutting. The segment 21 is pressed upwardly against the lowermost flange 20 on the stud 19 by means of a coiled return spring 22, the spring being coiled around the stud 19 and having one end 23 bent over against an edge of the steel bar 17 and the other end 24 hooked over and engaging an arm 25 of the segment 21. The spring 22 is tensioned to normally swing the segment 21 in a counter-clockwise direction relative to its point of support on the stud 19.

The segment 21 extends back from its point of support on the stud 19 to a point directly beyond the raised portion 18 on the steel bar 17 and the upper surface of the segment 21 normally lies in the same plane as the upper surface of the raised portion 18. The wide end of the segment 21 is an arcuate band 26 which is disposed and slides beneath the heel of the cutter 15 and is located outside of the periphery of the code disc 1 when the code disc 1 is in position in the cutting device.

An arm 27 of the segment 21 has an upturned lug 28 equal in width to the width of the slot 3 in the code disc 1. When the code disc 1 is first placed in the cutting device the lug 28 is positioned in the slot 3 to insure correct positioning of the segment 21 relative to the code disc 1 for the starting of the cutting operations. On the top face of the arcuate band 26 of the segment 21 are inscribed letters and numerals 29 for indicating points of setting for the segment and code disc necessary to obtain a required cutting. The segment 21 is provided on its arm 25 with an upwardly projecting lug 30, which in the normal position of the parts engages between adjacent teeth 2 on the code disc 1 to move that member into the cutting position required to obtain the cutting indicated by the index 29 on the face of the segment 21. Secured to the lower face of the steel bar 17 by means of the screws 16, 16 is a holding spring 31 provided on its free end with an ear or lug 32 having a suitably beveled end that engages between adjacent teeth 2 on the code disc 1 to hold the code disc 1 against undesired movement by the spring 22. The free end of the spring 31 carrying the lug 32 is permitted limited vertical movement by reason of a comparatively large aperture 33 and a comparatively small diameter stud 34. Movement of the free end of the spring 31 to withdraw the lug 32 from engagement with the teeth 2 of the code disc 1 is brought about by manually pressing downwardly on a tab 35 which extends downwardly from the free end of the spring 31 and beneath the steel bar 17. Since the free end of the spring 31 is capable of limited movement and the lug 32 is bent over on its end and is only just long enough to engage the teeth 2 of the disc 1, the disc 1 may be manually rotated in a clockwise direction by applying sufficient force to the disc to displace the free end of the spring so that the lug 32 is moved downwardly from engagement with the teeth 2. The spring 31, however, prevents accidental movement of the disc 1. If in turning the disc 1, however, the disc is moved beyond a desired point release of the lug 32 from engagement with the teeth to permit movement of the disc 1 in a counter-clockwise direction may be accomplished by manually pressing downwardly on the tab 35 as above-mentioned.

The segment 21 is adapted to be moved downwardly as a whole slightly and to be tilted relative to its pivotal point of support by operation of the cutting device. For obtaining this movement when the jaws 12 and 13 of the cutting device are in their closed position a downwardly extending release member 36 is attached to the upper jaw 12 of the cutting device. The release member 36 has a slotted lower end 37 extending transversely about the edge of the arcuate band 26 of the segment 21 in the form of a hook to engage opposite faces of the arcuate band 26. The downward movement of the upper jaw 12 operates this release member 36 to press the segment 21 downwardly to release the lug 30 from engagement with the teeth 2 of the code disc 1 and permit the segment 21 to quickly return to normal position under action of the spring 22 after each cutting operation of the device. Upon the return to normal of the jaws of the device the lug 30 will reengage between adjacent teeth 2 of the code disc 1 preparatory to the positioning of the code disc to a new position for cutting. When the jaws are returning to normal position the release member 36 presses upwardly against the lower surface of the ar-

cuate band 26 of the segment 21 and lifts the lug thereon into engagement with the disc thereby insuring return of the segment 21 to its normal plane. A combined guard and index point member 38 is provided on the outer end of the jaw 13 of the cutting device. The guard and index member 38 is L-shaped and has a front portion 39 extending downwardly above the upper face of the disc 1 to prevent raising of the outer portions of the disc 1 when the cutter is being withdrawn or the disc is being rotated to a required position. This front portion also serves to hold the disc when the segment is reengaged therewith. A side portion 40 of the member 38 extends downwardly toward the arcuate band 26 of the segment 21 and serves as an index point for gauging the extent of rotation of the segment 21.

To cut a disc 1 so that it may be used as a code disc in a repertory dialing device, a code disc 1 having its full complement of teeth 2 is placed in the cutting device by sliding the slotted portion 3 about the stud 19 and between the flanges 20, 20 until the bent portions 9, 9 of the spring 5 have passed the stud 19 and the stud 19 extends through the innermost portion of the slot 3. In doing this the lug 28 on the segment 21 must lie in the slot 3. The segment 21 is then manually rotated against the action of the spring 22 by grasping an upwardly turned lug 41 and swinging the segment 21 about its point of support on the stud 19. In doing this the disc 1 is rotated by reason of the engagement of the lug 30 with the teeth 2 of the disc 1. The disc 1 and the segment are rotated until the index figures on the arcuate band 26 and corresponding to the desired code setting come in line with the index point 40. The handles 10 and 11 are then manually pressed toward each other to move the cutter 15 against the teeth 2 and to shear off the teeth at the required point. When the handles are slightly released the segment 21 is automatically returned to normal position by means of the spring 22 since in a slightly released position the release member 36 is still sufficiently pressing the segment 21 downwardly to prevent engagement of the lug 30 with the teeth 2 of the disc 1. When the handles are fully released the lug 30 rises into engagement with the teeth 2 of the disc 1. The disc 2 is held during the return movement of the segment 21 by the lug 32 on the free end of the spring 31. By manually rotating the segment 21 again to another required position the disc is moved to another required position for cutting. In Fig. 3 the teeth 2 have been sheared at five required points and the segment 21 has returned to normal position.

It will be seen, therefore, that by simply moving, successively, the segment 21 to points where desired markings on the segment 21 are brought into line with the portion 40 of the index point 38 and by pressing the handles 10 and 11 toward each other to operate the cutter 15 as each point is reached a disc 1 may be cut to provide a code disc having teeth and spaces at predetermined points.

In the modification illustrated in Figs. 7, 8, 9 and 10 certain parts are identical with parts shown in the figures above described. These parts, therefore, are identified by the same numerals used in identifying them in the other figures. The modified form shows a perforated disc 42 which may be used in place of the disc 1 above described. A pin 43 is provided on the arm 25

of the segment 21 to take the place of the lug 30, the pin 43 being adapted to engage the perforations 44 in the disc 42 when the disc 42 is to be rotated. By moving the segment 21 and operating the cutting device, portions of the periphery of the disc 42 may be cut out to provide raised portions 45 and notches 46 as shown in Fig. 8. To take the place of the lug 32 on the spring 31 a pin 47 is provided as shown in Figs. 9 and 10. The pin 47 engages the perforations 44 and prevents accidental movement of the disc 42. A slot 48 and a screw 49 permit limited movement of the end of the spring 50 which corresponds to the spring 31 in Figs. 5 and 6.

In some cases discs are required with a comparatively large number of cuttings and it is found necessary to substitute teeth or perforations for the space taken by the radial slot at the point 3 in the disc during the cutting operation in order that the disc may be further rotated in the cutting device. To take care of such cases a filler-piece 51 as shown in Figs. 11 and 12 is provided for application to the cutting device. The filler-piece 51 is an arm pivotally supported on the stud 19 directly above the segment 21. The filler-piece 51 is the same width as the slot 3 and is raised for the greater portion of its length to lie in the same plane as the disc 1. The free end of the filler-piece 51 is apertured or is provided with teeth to correspond to the apertures or teeth in the code disc. In Fig. 11, teeth 52 are provided to correspond to the teeth 2 in the disc 1. Spaced plates 53, 53 are secured to the filler-piece 52 by rivets 54. The spaced plates are wider than the filler-piece 51 and are adapted to receive edge portions of the disc 1 adjacent the slot 3. A pin 55 extending upwardly from the segment 21 enters an aperture 56 in the filler-piece 51 and holds the filler-piece 51 in a required position to fill the slot 3 when the disc 1 is applied to the cutting device. The filler-piece 51 rotates with the disc 1 during the cutting operations and the teeth 52 take the place of the teeth 2 in the space in which no teeth are provided on the disc. The disc 1, therefore, may be rotated to the same extent as if teeth were provided all around its periphery instead of having a space with no teeth such as the slot 3. It is obvious, therefore, that by using the filler-piece 51 on the cutting device additional cuts may be made in the disc 1.

What is claimed is:

1. A device for cutting code discs which comprises a cutting blade, a rotatable disc engaging element for engaging and advancing the disc relative to said blade, means for actuating said blade to cause said disc to be cut and said disc engaging element to be disengaged from said disc.

2. A device for cutting code discs which comprises a cutting blade, a rotatable disc engaging element for engaging and advancing the disc relative to said blade, means for actuating said blade, and means controlled by the movement of said blade actuating means for restoring said disc engaging element to its normal position.

3. A device for cutting code discs which comprises a cutting blade, a rotatable disc engaging element for engaging and advancing the disc relative to said blade, means for actuating said blade, and means effective upon the actuation and release of said blade actuating means for restoring said disc engaging element to normal position.

4. A device for cutting code discs which comprises a cutting blade, means for operating said

blade, a rotatable disc engaging element to engage and rotate a disc relative to said blade and automatic return means in engagement with said rotatable disc engaging element to return said disc engaging element to normal position.

5 5. A device for cutting code discs which comprises a cutting blade, means for operating said blade, a manually operated disc engaging element to engage and rotate a disc relative to said
10 blade, automatic return means to return said disc engaging element to normal position and holding means engaging said disc during return movement of said disc engaging element to prevent return of said disc to normal position.

6. A device for cutting a code disc in which a radial slot is provided, comprising a cutting blade, means for operating said blade, a manually operated disc engaging segment to engage and rotate
5 the disc relative to said blade, automatic return means to return said segment to normal position after each cutting operation, holding means engaging the disc to prevent return of the disc to
10 normal position during the return movement of said segment and a filler-piece rotatable with the disc and extending into the radial slot in the disc, said filler-piece providing means for rotating the disc beyond its normal extent of movement.
HOWARD BROADWELL.