

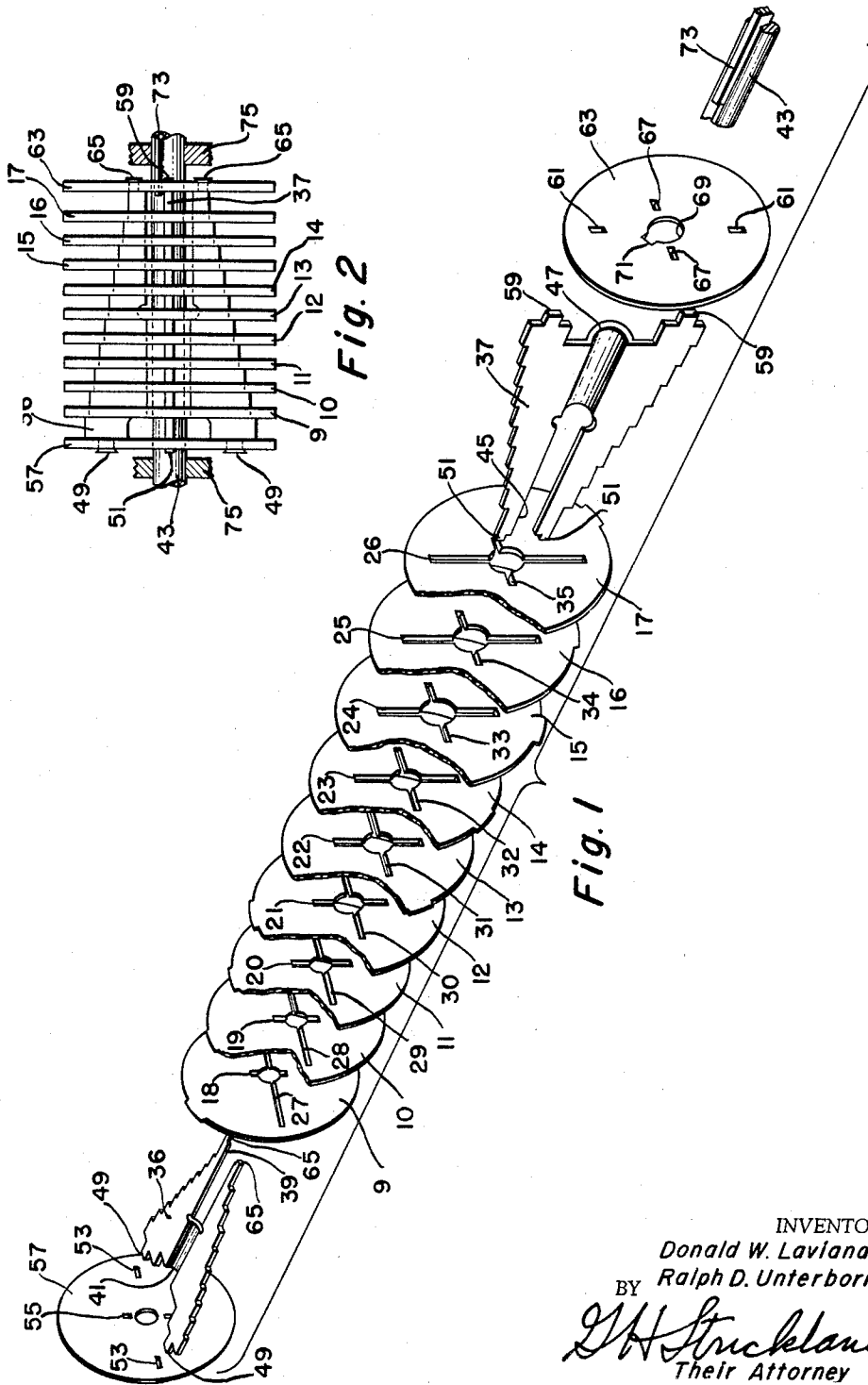
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CAM ASSEMBLY

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CAM ASSEMBLY

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6 Claims. (Cl. 74—567)

This invention pertains to a cam assembly such as used in multiple cam operated timer switches and controls.

It is customary to assemble cams by placing them one by one in proper orientation upon a keyed or splined shaft with suitable spacers in between. However, it is difficult to assure proper sequence of the cams by such an arrangement.

It is an object of this invention to provide an arrangement by which the cams are supported in properly aligned spaced relation without the use of individual spacers.

It is another object of this invention to provide a supporting arrangement by which the cams are also arranged in the proper sequence and orientation with a minimum of handling and error.

These and other objects are attained in the form shown in the drawings in which each of the cams is provided with transverse intersecting slots. The cams, when arranged in the order desired, have the lengths of one of the series of slots increasing in substantial increments from the beginning of the sequence of cams to the opposite end. The transverse slots diminish in substantial increments from the beginning to the end. The cams are supported on two identical oppositely and transversely positioned stepped members having dimensions such that each of the steps will fit one of the slots. One of the stepped members extends inwardly from the end of the sequence to the beginning, while the other transversely positioned stepped member extends from the beginning to the end of the sequence. The cams are held against the oppositely facing shoulders of the steps of the two stepped members to complete the cam assembly. The stepped members may be riveted to end members and mounted upon a keyed shaft.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is an exploded perspective view showing a cam assembly embodying one form of my invention; and

Figure 2 is a view, in elevation, of the cam assembly.

Referring now to the drawings, there is shown a series of nine cams designated by the reference characters 9-17 having cam lobes or notches on their peripheries. These cams may be made of discs of plastic material such as compressed paperboard impregnated with phenolformaldehyde resin. The cams each have arranged vertical slots designated by reference characters 18-26 which increase in the vertical dimension progressively beginning with the cam 9 and ending with the cam 17. The cams 9-17 also have horizontal intersecting slots 27-35, inclusive, which progressively decrease in their horizontal dimension beginning with the cam 9 and ending with the cam 17. These slots may be punched or molded in the cams.

According to my invention, for the purpose of supporting, spacing and arranging the cams in the proper se-

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quence, there are provided two identical stepped metal members 36 and 37, preferably of some suitable heavy sheet or strip metal such as steel or brass. The member 36 has steps beginning from the right end to the left end providing cross sections successively corresponding to the length and width of the slots 27-35 in the cams 9-17, inclusive. These cams 9-17, inclusive, can be readily threaded onto the horizontal member 36 to assume their proper positions. The member 36 has a central longitudinal slot 39 extending inwardly from its small end along the axis to substantially the mid-point thereof or slightly beyond. Beyond the slot 39, the member 36 is formed into a semi-cylindrical portion 41 of sufficient size to extend half-way around the shaft 43 on which the cam assembly is to be placed.

The vertical member 37 may be identical to the horizontal member 36 and has steps forming consecutive cross sections which correspond in thickness and height beginning from the left end to the right end to the vertical slots 18-26 of the cams 9-17, inclusive. This vertical member 37 has a slot 45 extending along its axis approximately to its midpoint and a semi-cylindrical portion 47 beyond the slot 45 so as to fit one-half of the shaft 43.

After the cams have been assembled in proper order and relationship upon the horizontal stepped member 36, the vertical member 37 is threaded in the opposite direction through the series of cams 17-9 until the steps thereof fit the vertical slots 18-26 in this series of cams. The slots 45 and 39 allow the step members 35 and 37 to interfit each other and extend all the way through the cams with the semi-cylindrical portions 41 and 47 being received by the respective slots 45 and 39 of the other step members 37 and 36.

The step member 36 has projections 49 at the large end, while the step member 37 has projections 51 at its small end which extend through properly located apertures 53 and 55 in the end disc 57 which may be of a material similar to the cams 9-17. The protruding ends of the members 36 and 37 on the opposite side of the member 57 are riveted to complete the fastening of the members 36 and 37 to the disc 57. At the opposite end, the projections 59 of the member 37 extend through the slots 61 in the end disc 63 and their protruding ends are riveted over to hold the end disc 63 fastened to the step member 37. The step member 36 also has projections 65 at its small end which extend through and protrude beyond the apertures 67 in the end disc 63. The protrusions of the projections 65 are riveted over to fasten the end disc to the step member 36.

The discs 9-17 as well as the end discs 57 and 63 are provided with central apertures 69, some or all being provided with a notch 71 for receiving the shaft 43 and its key 73. The key 73 may be short or long according to the number of notches provided. The shaft 43 may be rotatably mounted on suitable bearings 75 and driven in any suitable manner. The cam discs 9-17 are held between the oppositely facing shoulders of the generally flat step-shaped thin metal members 36 and 37 so that they are securely held against movement in opposite directions axially, while the transverse slots insure their proper orientation rotationally. The cams may each be keyed to the shaft 43 so that the drive between the cams and the shaft is equally distributed. This provides an improved cam assembly construction which is economical to manufacture.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. A cam assembly including a plurality of cams arranged in substantial coaxial alignment, said cams each

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being provided with a slot, one dimension of each of said slots increasing in substantial increments beginning with the first of said cams and extending consecutively to the last cam, and a member extending through and fitting each of said slots in each of said cams, a second slot in each of said cams transverse to said first named slots with one dimension of each of said slots decreasing in substantial increments beginning with the first of said cams and extending consecutively to the last cam, and a second member extending through and fitting each of said second slots in each of said cams for supporting and holding said cams in a desired relationship.

2. A cam assembly including a first generally flat member having its opposite edges step shaped and progressively converging from one end to the other, a plurality of cams having transversely intersecting crossed slots receiving said first member and being of such size as to fit upon different steps of said first member, and a second generally flat member extending in the opposite direction through the crossed slots transversely to the first member and having its opposite edges step shaped and converging in the reverse progression from said first member, the crossed slots of said cams being of such size so as to also fit upon different steps of said second member.

3. A cam assembly including a first generally flat member having its opposite edges step shaped and progressively converging from one end to the other, a plurality of cams having transversely intersecting crossed slots receiving said first member and being of such size as to fit upon different steps of said first member, and a second generally flat member extending in the opposite direction through the crossed slots transversely to the first member and having its opposite edges step shaped and converging in the reverse progression from said first member, the crossed slots of said cams being of such size so as to also fit upon different steps of said second member, end members fastened to the ends of each of said flat members, and means for supporting said end members.

4. A cam assembly including a first generally flat member having its opposite edges step shaped and progressively converging from one end to the other, a plurality of cams having transversely intersecting crossed slots receiving said first member and being of such size as to fit upon different steps of said first member, and a second generally flat member extending in the opposite direction through the crossed slots transversely to the first mem-

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ber and having its opposite edges step shaped and converging in the reverse progression from said first member, the crossed slots of said cams being of such size so as to also fit upon different steps of said second member, and members fastened to the ends of one of said flat members, and means for rotatably supporting said end members, each of said flat members having a central slot extending inwardly from one end for receiving the opposite end of the other flat member.

5. A cam assembly including a first generally flat member having its opposite edges step shaped and progressively converging from one end to the other, a plurality of cams having transversely intersecting crossed slots receiving said first member and being of such size as to fit upon different steps of said first member, and a second generally flat member extending in the opposite direction through the crossed slots transversely to the first member and having its opposite edges step shaped and converging in the reverse progression from said first member, the crossed slots of said cams being of such size so as to also fit upon different steps of said second member, said generally flat members each having a central axially aligned portion offset in the form of a half cylinder, and a supporting shaft extending through said cams and fitting the interior of each of said half cylinders.

6. A cam assembly including a plurality of cams arranged in substantial coaxial alignment, each cam having a slot, one dimension of each of said slots increasing in substantial increments beginning with the first of said cams and extending consecutively to the last cam, a first member extending through and fitting each of the slots in each of said cams, a second slot in each of said cams oriented at an angle to the first named slots with one dimension of each of said second slots decreasing in substantial increments beginning with the first of said cams and extending consecutively to the last cam, and a second member extending through and fitting each of said second slots in each of said cams for supporting and holding said cams in assembled relationship.

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