Sept. 9, 1958 E. J. LUCE 2,851,671

ELECTRICAL FUSE BLOCK

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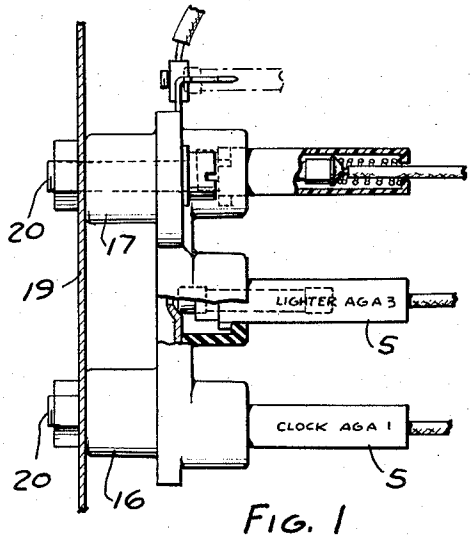


FIG. 1

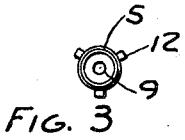


FIG. 3

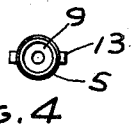


FIG. 4

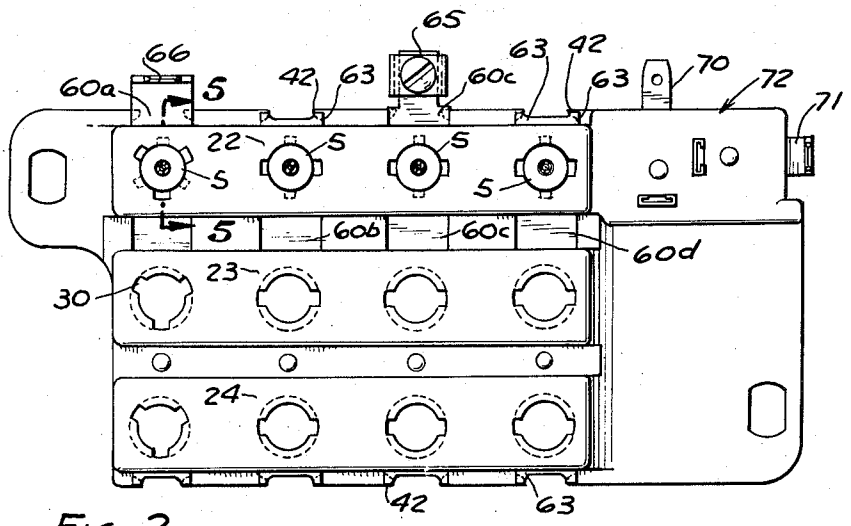


FIG. 2

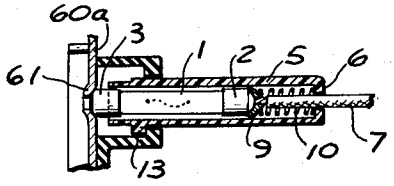


FIG. 5

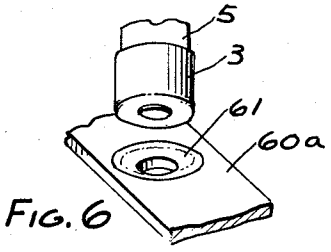


FIG. 6

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ELECTRICAL FUSE BLOCK

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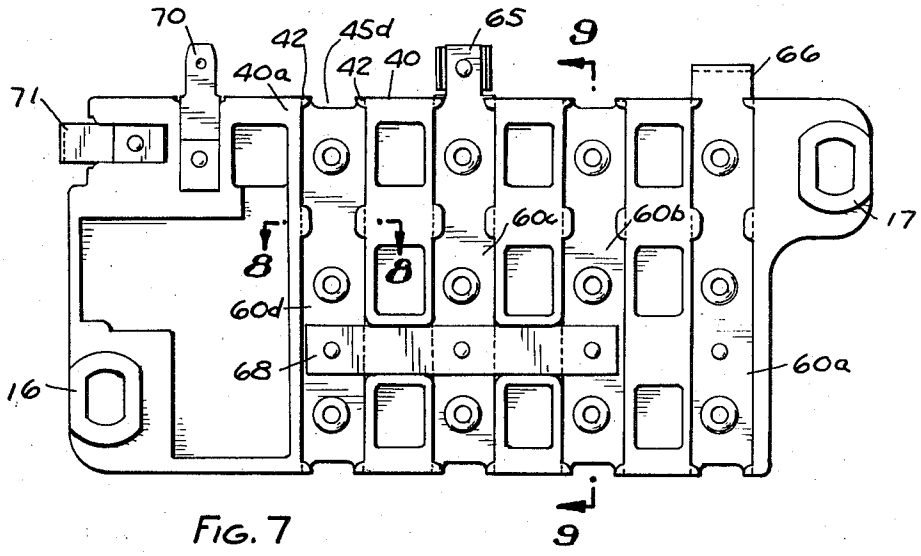


FIG. 7

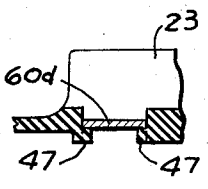


FIG. 8

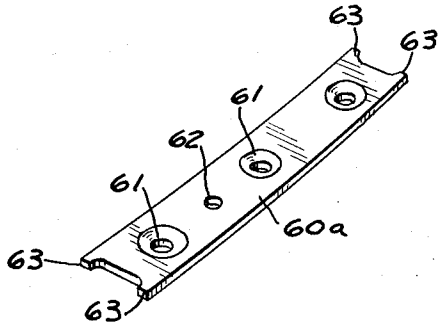


FIG. 10

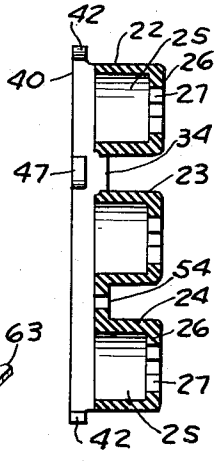


FIG. 11

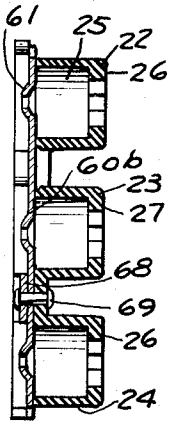


FIG. 9

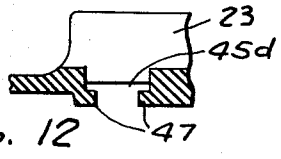


FIG. 12

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ELECTRICAL FUSE BLOCK

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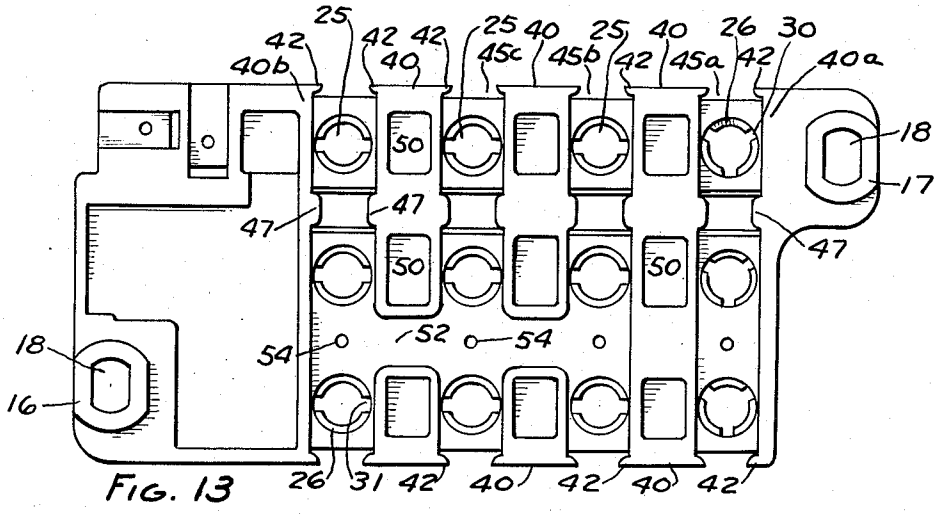


FIG. 13

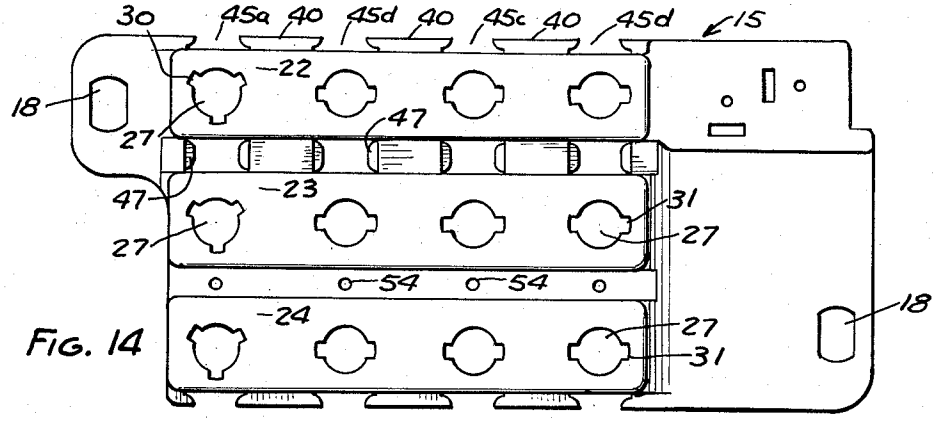


FIG. 14

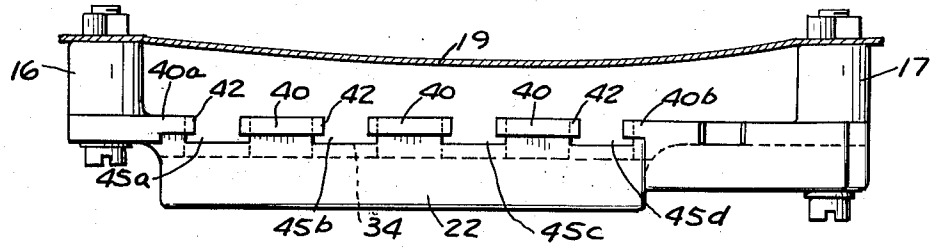


FIG. 15

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ELECTRICAL FUSE BLOCK

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Application September 30, 1955, Serial No. 537,852

7 Claims. (Cl. 339—150)

This invention relates to a holder or block for a plurality of electrical fuses. The invention has to do with a device especially adaptable for use in automotive vehicles whether passenger cars or commercial vehicles although the invention may be employed in stationary and other installations.

The object of the invention is to provide a device of unit construction for accommodating a plurality of fuses to the end that all, or at least many, of the electrical fuses used in an automotive vehicle, or in one installation, may be grouped in one location. In accordance with the invention the body of the device is preferably integrally formed or molded as one piece of suitable dielectric material, so shaped and formed that it may be readily molded with simple dies and yet one capable of receiving, with easy installation, electrical conductor members, and for detachably receiving elements which cooperate therewith to hold electrical fuses properly in position in electrical contact with the conductors. In disclosing the invention it is convenient to refer to the wiring system of automotive vehicles although, as stated above, the invention may be used elsewhere than in an automotive vehicle.

A structure made in accordance with the invention is shown in the accompanying drawings:

Fig. 1 is an end elevational view with some parts cut away and some parts in section showing the body or block mounted upon a suitable panel.

Fig. 2 is a front elevational view with some of the fuses in position and some omitted.

Fig. 3 is an end view of a cooperating fuse holder.

Fig. 4 is an end view of a different type of cooperating fuse holder.

Fig. 5 is a sectional view taken substantially on line 5—5 of Fig. 2 showing a fuse held in position.

Fig. 6 is a detailed view illustrating the manner of providing a contact with the end of a fuse.

Fig. 7 is a rear elevational view of the block with the electrical conductors assembled therewith.

Fig. 8 is a cross sectional view taken substantially on line 8—8 of Fig. 7 illustrating how a conductor is held in place.

Fig. 9 is a sectional view taken on line 9—9 of Fig. 7 showing electrical conductors assembled with the body.

Fig. 10 is a perspective view of a conductor member.

Fig. 11 is a view similar to Fig. 9 with the electrical conductors not assembled with the body.

Fig. 12 is a sectional view similar to Fig. 8 without the electrical conductor.

Fig. 13 is a rear elevational view of the body similar to Fig. 7 with the electrical conductors omitted.

Fig. 14 is a front elevational view similar to Fig. 2 with the electrical conductors omitted.

Fig. 15 is a top plan view showing the block or body with the electrical conductors omitted.

First considering the fuses and the cooperating fuse holders to be used with the block, it will be noted, considering Figs. 1 and 5, that the fuse 1 is an elongated

structure having a contact 2 at one end and a contact 3 at its opposite end. The fuse is positioned as shown in Fig. 5 in a retainer or receiver of dielectric material, preferably of suitable plastic. This receiver may be generally of elongated form having a body 5 and an apertured bottom 6 through which an insulated wire 7 extends. On the end of the exposed conductor of the wire is a contact member 9 slidably positioned in the retainer 5 and acted upon by a coil spring 10. The wire slides through the aperture in the bottom 6.

The retainer 5 is open at one end so as to receive the fuse, and near the open end the retainer is provided with one or more projections. The retainer shown in Fig. 3 has three projections 12 while the retainer shown in Fig. 4 has two opposite projections 13. These projections are to cooperate with a bayonet type of connection with the body as will presently be seen. The various retainers may be labeled to indicate the purpose and type of fuse to be used. For instance, the lowermost retainer 5, as shown in Fig. 1, has indicia indicating that it is for the electric clock with indicia indicating the size or type of fuse. The intermediate retainer has indicia relative to the cigar or cigarette lighter. The retainers for the other fuses may be similarly provided with indicia.

The block is arranged to receive a plurality of fuse retainers in a detachable manner. In considering the block and its structure, reference may be had particularly to Figs. 2, 7, 13 and 14. It is preferably an integral or one piece molding of dielectric material generally illustrated at 15. The block shown is designed to receive twelve fuses although blocks may be made for a larger or smaller number of fuses. The body has two projections 16 and 17 on its back side and apertures 18 extend through the body and through the projections. The projections are adapted to be abutted against a suitable supporting panel 19 and to be secured thereto by bolts 20. These projections are provided because there are times when the block must be mounted upon a panel which is curved or perhaps has a projecting part as indicated in Fig. 15, and thus notwithstanding the curvature or non-flat form, the block may be solidly positioned.

The integrally formed block has three raised portions 22, 23 and 24. Each raised portion has a plurality of hollow formations forming cavities 25 which extend through the block. All cavities are indicated by the single reference character 25. On the front side of the block the cavities are partially closed by a wall 26 defining an aperture 27. The wall 26 of some of the apertures are provided with three notches 30 (Fig. 14) while the wall defining other apertures 27 are provided with only two oppositely disposed notches or recesses 31. As shown in Fig. 14 the tier of apertures 27 located to the left of Fig. 14 are provided with three notches 30. Thus these apertures will receive only the form of fuse holder shown in Fig. 3 with three projections 12. The remaining recesses 27 with the two notches 31 will receive the fuse holder shown in Fig. 4. The purpose of this will presently appear.

The several projecting elements 22, 23 and 24 are spaced from each other as shown in Figs. 9 and 11, thus to expose the material of the block as indicated at 34 which material lies preferably in a common plane. This material 34, which runs through the center portion of the block, is indicated at dotted lines in Fig. 15.

On the side of the intermediate portion 34 opposite the projections 22, 23 and 24 are strip-like elements each indicated at 40. These, as shown in Fig. 13, are alternately disposed relative to the hollow portions 25 thus to expose the cavities 25. The counter-part of one side of each strip-like portion 40 is provided at the ends of the hollow propections 22, 23 and 24 as indicated at 40*a* and 40*b*. It will be noted, by considering Fig. 15, that the

elements 40, 40*a* and 40*b* lie in a plane removed from the center strip 34. Moreover, the ends of the strip-like elements 40 and the counter-parts 40*a* and 40*b* extend beyond the sides of the elements 22 and 24 as shown in Fig. 14. The elements 40 and 40*a* and 40*b*, at their ends, are provided with lateral projections 42. There are projections on both ends as shown in Figs. 13 and 14. All of these projections are given the same reference character since they are essentially the same structure in multiple. Accordingly, projections 42 lie in a plane removed from the center part 34 and on the opposite side of the center part 34 from the portions 22, 23 and 24, and thus appear to provide undercut or reentrant passages 45*a*, 45*b*, 45*c*, 45*d* between each pair of strip-like elements 40 and counter-parts 40*a* and 40*b*. Actually the parts 42, as shown in Fig. 15 do not overlie the center portion 34. The parts 40 and the counter-parts 40*a* and 40*b* are also provided with inwardly disposed projections 47. These are positioned at the location of the space between the elements 22 and 23. These elements 47 lie in the same plane as the projections 42 and, therefore, contribute to the apparent reentrant passageway 45. The block is provided with recesses 50 to facilitate uniform curing of plastic, as well as lightening the block and saving of material. As shown in Fig. 13, two of the strip like elements 40 are discontinued in their intermediate portion thus to provide a slot 52 interconnecting vertical tiers of cavities 25. The material 34, in the area between the projections 23 and 24 is provided with a plurality of apertures 54 for purposes which will presently be seen.

Electrical conducting elements are positioned in the apparent reentrant passageways 45. One such element is shown in Fig. 10 and it may be formed of suitable electrical conducting material, such as brass. The conductor element shown in Fig. 10 and indicated at 60*a*, is a strip preferably slightly curved as indicated, with depressions 61 therein and the material may have an aperture therethrough in the bottom of each depression. The strip has projections 63 at its ends. The element 60*a* may be slipped endwise with sliding manner into the apparent reentrant passage 45*a*. When in position it engages the material 34 on one side but the projections 42 and 47 overlie the strip on its opposite side and due to its curved form it is slightly flexed when positioned and thus held snugly. Specifically the projections 42 overlie the projections 63. A similar strip 60*b* is positioned in the next reentrant passage 45*b*. A similar strip 60*c* is positioned in the next reentrant passage 45*c* and a fourth strip 60*d* is positioned in the fourth reentrant passage 45d. The strip 60*c* may have an extending end 65 for connection to an electrical conductor and the strip 60*a* has an extending end 66 constituting a terminal for connection to an electrical conductor. A connector strip 68 positioned transversely of the other strips extends through the passage 52 and rivets 69 are applied through the apertures 54 in the body, the apertures 62 and through corresponding apertures in the strip 68. Thus, the strips 60*b*, 60*c* and 60*d* are in electrical connection with each other and may be connected to a single conductor connected at 65. The strip 60*a* is electrically disconnected from all other strips. The cross strip 68 securely holds the other strips from displacement.

When assembled the projections 63 of the several strips may be slightly exposed as shown in Fig. 2 but their ends underlie the projections 42. When a fuse is placed in a retainer as shown in Fig. 5, the retainer is then passed through one of the openings 27 with the projections on the retainer passing through notches in the members 22, 23 or 24 and then the receiver is turned on its axis to disalign its projections from the recesses, and then a bayonet type connection is made. In this action the contact 3 of a fuse (Fig. 5) is urged by the spring 10 into electrical contact with a contact member which, as Fig. 5 is viewed, is the contact strip 60*a*. The fuse conductor is often soldered to the end contacts 2 and 3 at the center thereof, and providing depressions 61, particularly with the aperture therein, the pressure of the engagement is around the peripheral edge of the contact 3 instead of at the center where there might be a spot or a projection caused by the soldering. It is for this reason that the contact 9 is similarly recessed or concaved.

In an automotive vehicle some accessories or electrical equipment are connected through the ignition switch of the engine and some are connected for use independently of the engine ignition switch. For example, the electric clock, the cigar lighter, and the interior lights may have their fuses positioned for contact with the member 60*a* (Fig. 2) and the holders therefore have the three projections 12 and the sockets for the three recesses 30. Again, for example, the radio, the heater, and perhaps the instrument lights, and other things, are operable only when the ignition switch of the engine is turned on and these may be serviced by fuses connected into apertures for engagement with the strips 60*b*, 60*c* and 60*d*. Suffice it to say that a conductor line is to be joined at 65, and the conductors of the several fuses in contact with the strips 60*b*, 60*c* and 60*d* extend to their respective electrical devices or lights. Similarly, a conductor is to be applied at 66 for the other services.

The block shown in the drawing is formed with contacts 70 and 71 which are for connection to a conductor leading to a flash indicator, such as a turn signal, and the thermostatic flashing device may be incorporated in the body, some of the parts thereof being indicated at 72.

The body or block shown herein is of a size as to receive twelve fuses. With the use of such a block all of the fuses of an automatic vehicle may be conveniently compactly located in one position. Any one of the fuses may be easily and quickly replaced by merely turning its holder 5 to align the projections thereon with the recesses therefor so that the holder may be removed, the fuse replaced and then the holder reinserted in position. Obviously, the block may be enlarged or ensmalled to accommodate a greater or smaller number of fuses.

Due to the fact that the block has no recesses of reentrant form it may be easily and conveniently cast or formed from a simple mold. As started above, the slots for receiving the conductor strips, while presenting an apparent reentrant form, is actually not reentrant because the projections 42 are removed from the plane of the central portion of the block and are spaced from the edges thereof. Similarly, the projections 47 are removed from the plane of the central portion and overlie openings which extend through the block. These openings occur between the cavities 25 of the elements 22, 23 and 24 and between the strip like members 40.

I claim:

1. In a fuse holder for receiving a plurality of fuse retainers wherein each fuse retainer receives a fuse and has a spring therein urging its fuse outwardly of the retainer and each retainer has securing means thereon, the combination comprising an integral fuse block of dielectric material having a central portion lying substantially in a single plane, a plurality of housing portions projecting from one side of the central portion and having spaced cavities therein extending entirely through the fuse block, the axes of said cavities being generally parallel, integral securing means on the outer end of each said cavity for cooperating with the securing means of a fuse retainer, a plurality of spaced strip like portions projecting from the opposite side of the central portion, said strip like portions extending beyond the periphery of the central portion, said strip like portions having laterally extending projections spaced from the central portion and positioned beyond the periphery of the central portion to form apparent re-entrant slots, and a plurality of metal conductor strips positioned in the apparent reentrant slots and extending across the inner ends of said cavities.

2. The combination set forth in claim 1 wherein said

fuse block has openings extending therethrough located between the spaced housing portions and the spaced strip like portions, said strip like portions having additional laterally extending projections projecting over said latter openings and contributing to the apparent re-entrant slots.

3. The combination set forth in claim 1 wherein each said metal conductor strip has projections on the end thereof for engaging said projections on said strip like portions which are beyond the periphery of the central portion of the fuse block.

4. The combination set forth in claim 1 wherein said strip is provided with a plurality of apertures therein, each said aperture being in alignment with the axis of a cavity, and a depression formed in said strip around the periphery of each said aperture and adjacent each cavity.

5. In a fuse holder for receiving a plurality of fuse retainers wherein each fuse retainer receives a fuse and has a spring therein urging its fuse outwardly of the retainer and each retainer has securing means thereon, the combination comprising an integral fuse block of dielectric material having a central portion lying substantially in a single plane, a plurality of elongated housing portions projecting from one side of the central portion, each said housing portion having spaced cavities therein extending entirely through the fuse block, the axes of said cavities being generally parallel, integral securing means on the outer end of each said cavity for cooperating with the securing means of a fuse retainer, a plurality of spaced strip like portions projecting from the opposite side of the central portion and extending transversely of

the housing portions, said strip like portions extending beyond the periphery of the central portion, said strip like portions having laterally extending projections spaced from the central portion and positioned beyond the periphery of the central portion to form apparent re-entrant slots, a plurality of metal conductor strips positioned in the apparent re-entrant slots and extending across the inner ends of said cavities, and a connector strip mounted on said block and extending transversely between some of said conductor strips to provide an electrical connection therebetween.

6. The combination set forth in claim 5 wherein some of said strip like portions are interrupted to provide a passageway, said electrical connector strip being disposed in said passageway.

7. The combination set forth in claim 5 wherein said fuse block has openings extending therethrough located between the spaced housing portions and the spaced strip like portions, said strip like portions having additional laterally extending projections projecting over said latter openings and contributing to the apparent re-entrant slots.

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