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CLIP FOR ATTACHING TRIM OBJECTS

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Fig. 1.

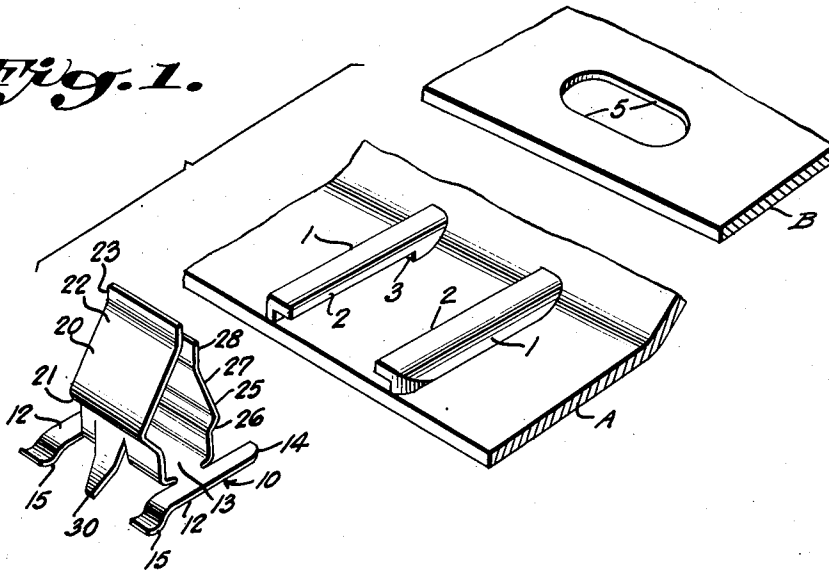


Fig. 3.

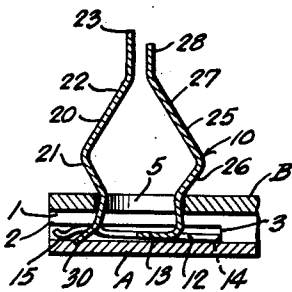


Fig. 2.

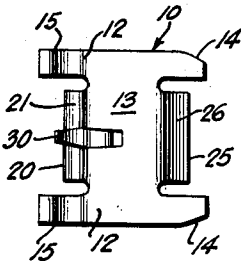
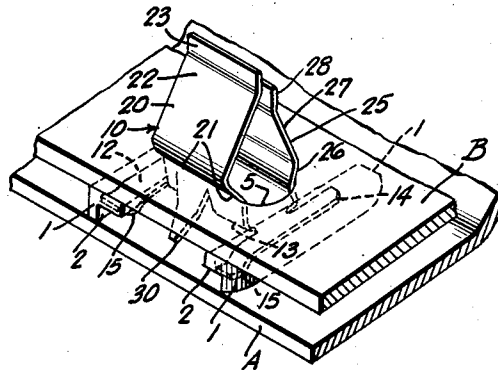


Fig. 4.

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CLIP FOR ATTACHING TRIM OBJECTS

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This invention relates to spring clips or fasteners which are used in the fabrication of various cabinet constructions, and the like, for mounting or attaching trim and finishing objects and similar articles in the form of elongate plates or strips commonly known as breaker strips, molding strips, sealing strips, etc.

In the fabrication of refrigerator door structures, refrigerator casings and similar types of cabinet structures, it is usually necessary or desirable that a trim strip, breaker strip, molding, or other finishing object be secured in desired position in the complete structure by an operation taking place entirely from the outer or readily accessible side of the assembly inasmuch as the rearward or reverse side thereof seldom is conveniently or readily accessible for the application of fastening means for this purpose.

The trim or finishing objects preferably are relatively simple designs which may be economically provided in the form of elongate plate-like articles of relatively thin cross-section and made of molded plastic materials in a simple molding operation or in the manner of simple sheet metal stampings, castings, or the like. Breaker strips are advantageously provided in this manner in that there are no projecting parts thereon subject to damage and the same otherwise may be compactly packaged to reduce the cost of shipping and handling to a minimum. Such trim or finishing objects are provided with a suitable connecting means for easy and quick attachment thereto of spring clip fastening devices designed for mounting the same in an assembly by substantial snap fastening action or otherwise adapted to provide the desired interlock between the finishing object and the supporting structure. One arrangement of such connecting means involves the use of spaced parallel connecting ribs, flanges, or the like, which are provided either as integral portions of the trim or finishing object or as separate elements secured to the underside thereof in any suitable way as by adhesive, welding or other securing means which is not visible on the outer or exposed surface of the trim or finishing object.

Many trim and finishing objects provided by mass production methods, particularly those made of plastic materials, frequently are not uniform throughout their lengths in the space between the connecting ribs and the underside of the trim or finishing object and these irregularities often vary to a relatively wide degree. Consequently, in the use of clips designed only for a specific spacing of the connecting ribs or flanges from the underside of the trim or finishing ob-

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ject, there are usually several clips in an installation which do not secure the trim or finishing object properly with complete effectiveness in the manner intended.

5 A primary object of this invention, therefore, is to provide an improved spring clip or fastener which is adapted to be attached effectively to such a trim or finishing object despite manufacturing variations and inconsistencies in the spacing of the connecting ribs or flanges from the body of the trim object so that each clip is attached firmly and rigidly to the trim object in such a way as to insure a completed installation which is strong and durable throughout.

10 A further object of the invention is to provide a fastener of this character in which the fastener head is composed of spaced head sections which are adapted to be attached to a trim or finishing object in interconnected relation with the connecting ribs or flanges on the trim or finishing object together with means providing for a positive lock of the fastener in such attached position.

15 Another object of the invention is to provide a fastener of the kind described which is adapted to be locked in attached position on the trim object and which may be readily released from such locked position and removed from the trim object.

20 A further, more specific object of the invention is to provide an improved spring fastener, such as described, comprising a highly simplified construction which is readily provided from a sheet metal blank to define a head member composed of spaced head sections and shank elements extending from said head member together with a locking tongue or detent on the head member for providing a positive lock of the fastener in attached position but releasable and removable from such attached position by a simple manipulation of the shank elements of the fastener.

25 Further objects and advantages, and other new and useful features in the construction, arrangement and general combination of elements of the improved clip fastener of the invention will be readily apparent as the following description proceeds with reference to the accompanying drawings, for purpose of illustration but not of limitation, in which like reference characters designate like parts throughout, and in which:

30 Fig. 1 is an exploded perspective view showing a spring clip or fastener in accordance with the invention in position for attachment to a breaker strip or other trim object to be secured to a supporting plate or panel, or the like;

35 Fig. 2 is a perspective showing the fastener of

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Fig. 1 as attached to the breaker strip and secured in a panel opening to retain the breaker strip in mounted position;

Fig. 3 is a sectional view of Fig. 2 as seen on a vertical plane through the center of the width of the fastener shank shown in Fig. 2; and,

Fig. 4 is a top plan view of the fastener per se showing the same as provided with a locking tongue or detent.

Referring now, more particularly, to the drawings, Fig. 1 illustrates a trim or finishing object A which is provided in the form of an elongate plate, molding or similar trim object. Such a trim object A is provided on the underside thereof along its length with a series of pairs of spaced parallel connecting ribs 1 for the attachment thereto of the required number of clips or fasteners 10 for securing said trim object to the supporting part B which is usually in the form of a flange or panel of a cabinet or casing construction; or the like.

The supporting part B is provided with a series of holes or fastener receiving openings 5 in predetermined spaced relation along the path which the trim or finishing object A extends in mounted position and the fasteners 10 are attached to the trim object A in a corresponding spacing so as to be received in said openings 5 in the manner of snap studs to secure said trim object in mounted position of said supporting part B.

The trim or finishing object A preferably is provided in a relatively simple design in the form of an elongate plate-like article made of molded plastic material, or composition or fibre board, or as a simple sheet metal stamping, casting, or the like. Such plastic finishing objects preferably are provided in this manner inasmuch as there are no projecting parts thereon subject to breakage and the same otherwise may be compactly packaged to reduce the cost of shipping and handling to a minimum. The pairs of spaced connecting ribs 1 are provided either as integral elements on the undersurface of the trim or finishing object, as shown, or on a separate block secured to the underside of said object in any suitable way as by adhesive, welding or other means which is not visible on the outer or exposed surface of the object.

In this relation, a further advantage is obtained in that it is often necessary or desirable for a saving in material, that the trim or finishing object be of comparatively thin cross-section and usually of insufficient thickness to conceal a metallic insert or threaded screw fastening. In the instant construction, the use of threaded fastenings is avoided and by employing the improved spring clips in combination with the pairs of spaced connecting ribs 1 on the underside of the object A, as aforesaid, the object may be provided in any selected decorative configuration and of relatively thin cross-section, and yet rigidly and securely mounted onto the supporting panel B or other supporting structure and by completely concealed fastening means which do not mar or detract from the appearance of the trim or finishing object in mounted position. In the present example, the trim object A is provided in what is commonly known as a breaker strip which comprises an elongate plate-like member on the underside of which there are provided the pairs of spaced connecting ribs 1 in predetermined spaced relation along the length of said object A. These pairs of spaced connecting ribs 1 are so provided as to include intumed flanges 2 which are spaced from the body of the trim object A and define

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spaced grooves or channels having open outer ends and end walls 3, Fig. 3, at the inner ends of said grooves. The arrangement is such that the spaced grooves or channels provided by said pair of spaced connecting ribs 1 are adapted to receive and retain similarly spaced head sections on a clip fastener 10 applied through the open outer ends of said connecting ribs 1 to a specific attached position as determined by said end walls 3.

The clip fastener designated generally 10, is a simple inexpensive article of manufacture which may be constructed from any suitable sheet metal material, preferably spring metal such as spring steel or cold rolled steel having spring-like characteristics. The devices may be formed from blanks of various outlines, but from a quantity production standpoint, are most advantageously provided from a comparatively small, generally rectangular blank which may be obtained from standard sheet metal strip stock with little loss or waste of material.

The sheet metal blank for providing the fastener is slit longitudinally to define a pair of head sections 12 on opposite sides of a central base or body 13 of the fastener. The spaced head sections 12 of the fastener are so provided that the outer longitudinal edge portions thereof are readily slidable in the grooves defined by the intumed flanges 2 of the pair of spaced connecting ribs 1. The corners of the leading ends of the head sections 12 preferably are bevelled as at 14 to facilitate the entrance of said head sections 12 into the grooves provided by said intumed flanges 2 of the connecting ribs 1, while the trailing ends of said head sections 12 are bent slightly outwardly and curved or rounded to define resilient bearing portions 15 having reversely directed extremities. The head sections 12, thus provided, are readily receivable in the grooves defined by the intumed flanges 2 on the connecting ribs 1 with said head sections 12 engaging said intumed flanges 2 and the curved bearing portions 15 engaging the adjacent underside of the body of the trim object A. The extremities of the said curved bearing portions 15, however, extend free and out of contact with the intumed flanges 2 and the underside of the trim object A such that said bearing portions 15 permit said head sections 12 to slide inwardly or outwardly in the grooves defined by the connecting ribs 1 and otherwise frictionally retain said head sections 12 in fixed relation as attached to said connecting ribs 1.

The fastener base or body 13 carries a pair of leg members 20, 25, which are bent in the same general direction to one side of said fastener base 13 to provide the shank of the fastener. The leg member 20 is slightly longer than the leg member 25 and both of said leg members are bent intermediate their lengths to define similar cam shoulders 21, 26, respectively, diverging outwardly from the fastener base 13 and merging into similar guide surfaces 22, 27, respectively, converging inwardly toward the respective free ends 23, 28 of said leg members. The free ends 23, 28, respectively, of said leg members are bent to extend in substantially parallel and spaced relation with the free end 23 on the longer leg member 20 slightly overlapping the end of the shorter leg member 25.

The longer leg member 20 carries a locking tongue or detent 30 which is provided from the material of the fastener base 13 by a suitable partially slit portion which extends into said longer leg member 20. This slit portion is so cut that the free end of said tongue 30 is pro-

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vided from the fastener base 13 while its other end is integral with said leg 20 and is actually carried thereby such that movement of said leg 20 causes a proportionate movement of said locking tongue 30. The locking tongue 30 is bent to extend in inclined relation in the opposite direction from the leading ends 14 on the head sections 12 and otherwise has its extremity projecting outwardly beyond the general plane of said head sections 12.

The clip or fastener 10 thus provided is easily and quickly attached to the trim object or breaker strip A in interconnected relation with the pair of connecting ribs 1 by inserting the head sections 12 into the grooves defined by the intumed flanges 2 of the connecting ribs 1 from the open ends of said grooves. The bevels 14 on the leading ends of the head sections 12 facilitate the initial insertion of said head sections into said grooves and the fastener is thereupon pushed forwardly until the leading ends of said head sections 12 abut the end walls 3 of said grooves, as shown in Fig. 3, thus locating the fastener in precise, predetermined attached position on the trim object A. In this relation, the curved or rounded bearing portions 15 on the trailing ends of said head sections 12 resiliently engage the underside of the body of the trim object A, as seen in Fig. 3, and cooperate with adjacent portions of said head sections 12, in engagement with the intumed flanges 2, to provide a frictional fit of said head sections 12 in fixed relation with said connecting ribs 1.

The locking tongue 30, as stated, extends in inclined relation in the opposite direction from the leading ends 14 of the head sections 12, and accordingly, in the aforesaid application of the fastener to attached position, the extremity of said locking tongue 30 slides readily over the surface of the trim object A to such attached position, as shown in Figs. 2 and 3, whereupon the sharp extremity of said locking tongue 30 becomes effective to bite into the adjacent surface of said trim object A to prevent movement of the head sections 12 in the reverse direction toward removal of the fastener from attached relation with said connecting ribs 1. The locking tongue 30 thus serves to provide a positive lock of the fastener 10 in its attached position on the trim object A such that there is little possibility of any accidental or unintended removal of the fastener from such attached position. This is important in mass production methods of manufacture in which the breaker strips or other trim objects A are prepared in quantity ready for use with the fasteners 10 pre-assembled therewith. Such assemblies may then be stacked and handled with little danger of displacing the fasteners from their applied position and with the assurance that the fasteners will be correctly located for mounting the trim object A to the supporting part B in the subsequent assembling operation.

An important feature of the clip or fastener of the present invention resides in the construction by which the fastener is adapted to be locked in applied fastening position by the locking tongues 30, as aforesaid, but with the clip otherwise adapted to be easily and quickly removed from such attached position whenever this may be necessary or desirable as, for example, in the repair or replacement of a damaged member. To this end, the leg members 20, 25, are provided in spaced relation at their respective free end por-

tions 23, 28, such that they are adapted to be compressed toward each other from their normal untensioned relation in the attached position of the fastener on the trim object A, substantially as shown in Fig. 3. Accordingly, inward movement of the longer leg member 20 toward the shorter leg 25 causes a proportionate movement of the locking tongue 30 carried thereby in such a manner that the extremity of said locking tongue 30 is disengaged from the trim object A at the point of contact therewith, whereupon the head sections 12 of the fastener are adapted to be removed from connected relation with the connecting ribs 1 by sliding the same in a reverse direction to that from which the same were applied thereto. Only a small spacing of the leg members 20, 25, at their free end portions 23, 28, is required for this purpose, as necessary to provide the required inward movement of the longer leg member 20 toward the shorter leg member 25, and the greater length of the longer leg member 20 is such as to permit the same to overlap the shorter leg member 25 in compressed relation thereto.

From the foregoing, it will be understood that in the procedure for mounting a trim object or finishing object A on the supporting part B, as many spring clips or fasteners 10 as are necessary are attached to the pairs of spaced connecting ribs 1, in the manner described, and in spaced relation corresponding to the spacing of the fastener receiving openings 5 provided in the supporting part B along the path which the object A extends in mounted position. In the mounting operation, the projecting shank of each clip defined by the cooperating leg members 20, 25, is readily entered into the associated panel opening 5 inasmuch as said leg members having a spacing at the leading end of the shank less than the size of the panel opening. Axial pressure is then applied to the outer surface of the object A in the area of the head sections of a fastener to move the shank of the fastener axially into the panel opening 5 whereupon the converging guide surfaces 23, 27, cam against the marginal edges of the panel opening to cause a gradual contraction of the leg members 20, 25, as necessary for the cam shoulders 21, 26, thereon to pass through the panel opening and ride on the lower corner edges of said opening at the reverse side of said part to the point of most effective fastening engagement. Such tapering cam shoulders 21, 26, adapt the clip fastener for effective application to panel supports of different thicknesses, within limits, and otherwise provide a suitable axial drawing action on the clip shank to secure the object A tightly against the supporting part B in mounted position. Inasmuch as the spaced head sections 12 of the fastener are interlocked with the intumed flanges 2 of the connecting ribs together with the positive lock provided by the locking tongue 30, as aforesaid, there is no tendency for the clips to become displaced or removed from attached position with the trim or finishing object A during the operation of forcing the clip shanks through the panel openings 5.

The fastener in any form preferably is constructed of relatively thin sheet metal the thickness of which is selected according to service requirements and the predetermined size of the parts secured. The fasteners are most effective when provided of spring metal suitably spring tempered and otherwise treated to give the desired toughness and hardness, particularly in the

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case of devices which are used in installations where extreme vibratory motion takes place. A cheap and highly effective fastener may be provided from cold rolled metal, such as cold rolled steel, which is untempered but of a spring metal nature and capable of providing an effective and reliable fastening means in accordance with the present invention.

While the invention has been described in detail with a specific example, such example is intended as an illustration only inasmuch as changes in the construction and arrangement of the clip or fastener within the broad scope of the instant disclosure are fully contemplated.

What is claimed is:

1. A fastener for securing a trim object to a supporting part, said trim object having means defining a pair of spaced grooves at the underside thereof, said fastener comprising a piece of sheet metal defining a base and a pair of spaced head sections receivable in said spaced grooves on the trim object, a shank projecting from the undersurface of said fastener base comprising a leg member adapted to be secured to said supporting part, and a locking tongue projecting outwardly from the upper surface of said fastener base and having its free end extending outwardly beyond said pair of spaced head sections in position to engage said trim object for locking the fastener in attached position on said trim object.

2. A fastener for securing a trim object to a supporting part, said trim object having means defining a pair of spaced grooves at the underside thereof, said fastener comprising a piece of sheet metal defining a base and a pair of spaced head sections receivable in said spaced grooves on the trim object, a shank projecting from the undersurface of said fastener base comprising a leg member adapted to be secured to said supporting part, and a locking tongue carried by

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said leg member and projecting outwardly from the upper surface of said fastener base, said locking tongue having its free end extending outwardly beyond said pair of spaced head sections in position to engage said trim object for locking the fastener in attached position on said trim object.

3. A fastener for securing a trim object to a supporting part, said trim object having means defining a pair of spaced grooves at the underside of said trim object, said fastener comprising a piece of sheet metal bent to define a base and a pair of spaced head sections receivable in said spaced grooves on the trim object, a pair of leg members projecting from the undersurface of said fastener base and adapted to be secured to said supporting part, said leg members extending in spaced relation and being spaced at their free ends, and a locking tongue carried by one of said leg members and projecting outwardly from the upper surface of said fastener base, said locking tongue having its free end extending outwardly beyond said pair of spaced head sections in position to engage said trim object for locking the fastener in attached position on said trim object, said locking tongue being adapted to be released from said locking relation upon movement of said leg member on which it is provided toward the other leg member.

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