Dec. 20, 1932. H. T. THOMAS 1,891,289

DOOR DOVETAIL

Filed Jan. 16, 1931 2 Sheets-Sheet 1

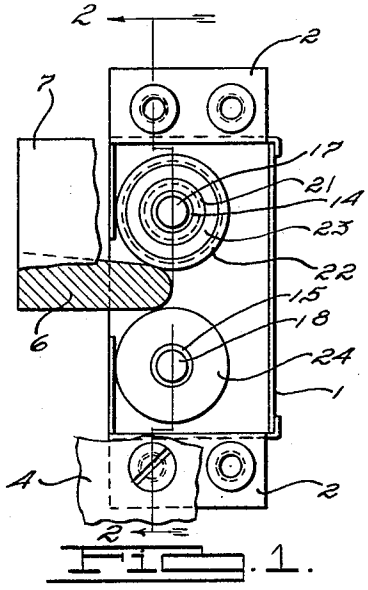


Fig. 1.

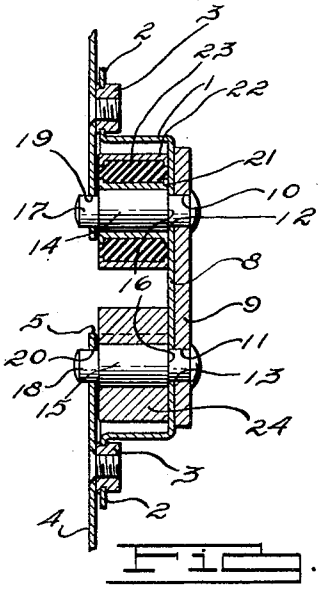


Fig. 2.

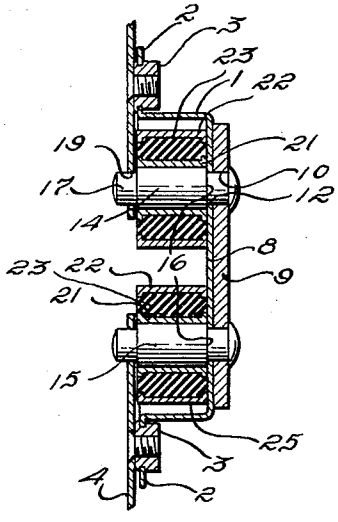


Fig. 3.

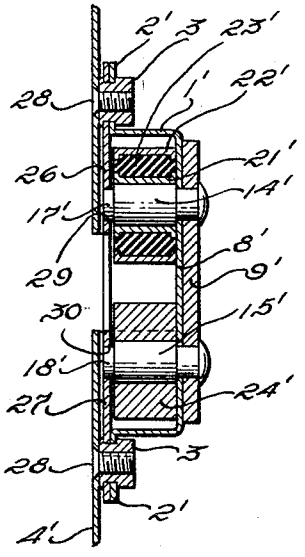


Fig. 4.

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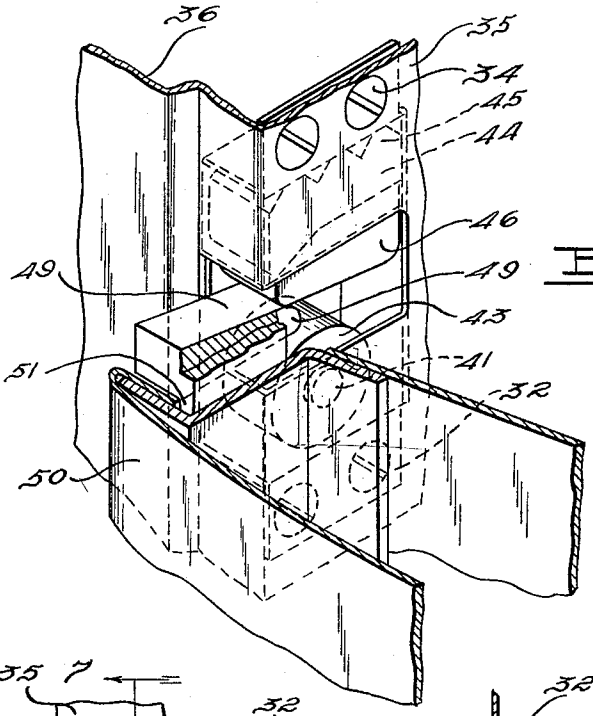


Fig. 5.

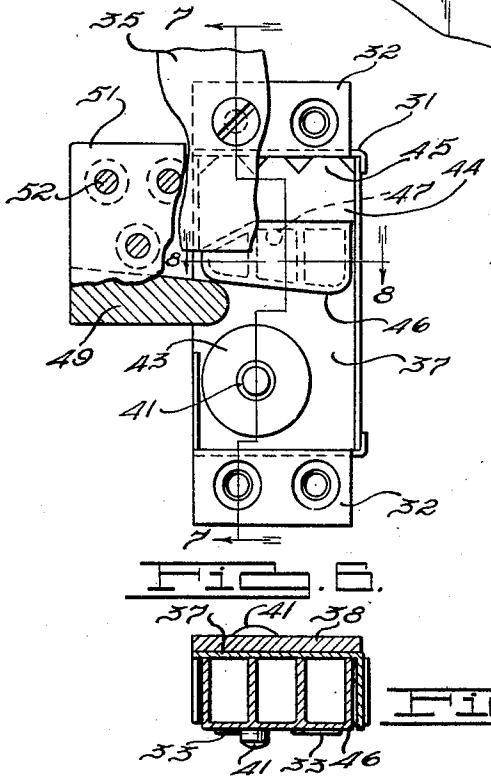


Fig. 6.

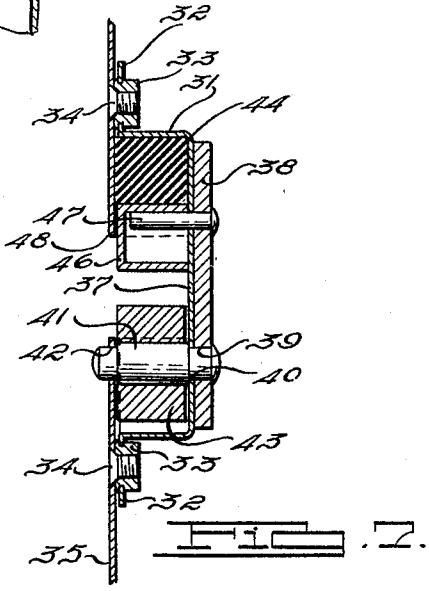


Fig. 7.

Fig. 8.

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UNITED STATES PATENT OFFICE

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DOOR DOVETAIL

Application filed January 16, 1931. Serial No. 509,147.

This invention relates to an improved door dovetail, particularly of the type used in vehicle body construction.

Heretofore in attempting to hold closed doors of a vehicle against movement relative to the vehicle body, it has been the practice to employ door dovetails of the type which have a pair of vertically spaced yieldable members secured to the door pillar between which is insertable a tongue carried by the door. The function of the yieldable members is to resiliently press upon the upper and lower sides of the tongue when the door is closed and insertion of the tongue between the yieldable members during closing of the door is relied upon to place them under compression. The friction resulting from sliding contact between the tongue and yieldable elements of prior devices of this kind has limited the degree of compression obtainable without excessively resisting closing of the door to such an extent that in practice, the yieldable elements cannot be conditioned to exert enough pressure to firmly hold the vehicle door against movement. As a result, the weight of the door, which is constantly applied upon the lowermost yieldable member, causes the latter to yield sufficiently to allow the lower edge of the door to pound upon the bottom of its frame and frequently jolting of the body thrusts the upper edge of the door against the registering body structure.

The main objects of this invention are to provide an improved door dovetail which may be conditioned during closing of a door to firmly hold the latter against movement without excessively resisting opening and closing of the door; to provide improved elements for urging a tongue of the device against a yieldable element thereof so as to place the latter under compression as the door is closed; to provide elements of this kind which have rolling contact with the tongue so as to allow sufficient compression of the yieldable element to hold the door against endwise movement without frictionally binding the door in a closed position; to provide yieldable elements in a device of this character which also have rolling contact with the tongue member; to provide rigid means for supporting part of the weight of the door; and to provide means of this kind in a door dovetail which has rolling contact with the lower side of the tongue for positively limiting downward movement or sagging of the door under its weight.

Further objects of this invention are to provide an improved casing for the elements between which the tongue of the door dovetail is receivable; to provide a casing of this kind which is securable to a door pillar and which has pins for rotatably supporting the rolling contact elements; and to provide pins in the casing which have protruding ends seated in apertures in the door pillar and supported partly by the latter so as to positively locate the dovetail at a predetermined position on the pillar.

An illustrative embodiment of my invention is shown in the accompanying drawings in which:

Fig. 1 is a side elevation of a door dovetail which embodies my invention.

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 but showing a vertical section of a modified form of the invention.

Fig. 4 is a vertical section of another form of my invention.

Fig. 5 is a fragmentary perspective view, partly in section, showing a further development of the invention and illustrating the manner in which the door dovetails of all the forms are incorporated in a door pillar.

Fig. 6 is a side elevation of the door dovetail shown in Fig. 5.

Fig. 7 is a vertical section taken on the line 7—7 of Fig. 6.

Fig. 8 is a fragmentary transverse section taken on the line 8—8 of Fig. 6.

In the form shown in Figs. 1 and 2, the door dovetail includes a sheet metal casing 1 of rectangular shape having outwardly extending end flanges 2. The flanges 2 are provided with apertures in which nuts 3 are located, the nuts being burred or otherwise rigidly secured to the flanges. The entire casing is, in practice, seated in a recess formed

in the external edge of a door frame structure of the type shown in Fig. 5, in opposite relationship to the hinged side of a door and the end flanges 2 of the casing are located adjacent the internal side of the door pillar 4 of the door frame structure. Formed in the door pillar 4 in registration with the central portion of the casing 1, is a slot 5 through which is insertable a male member or tongue 6 which is securable to the free vertical edge of the door by a flange 7.

Located on the side wall 8 of the casing 1 is a reinforcing bar 9 which has spaced apertures 10 and 11 registering with apertures 12 and 13 in the side wall 8 of the casing. Dowel pins 14 and 15 having reduced end portions extending through the registering apertures of the casing and reinforcing members 1 and 9, respectively, extend transversely through the casing 1. The inner extremities of the dowel pins 14 and 15 are burred over so as to hold the pins against displacement with their shoulders 16 firmly clamped against the inner surface of the side wall 8 of the casing. The outer reduced end portions 17 and 18 of the dowel pins 14 and 15, respectively, are received in spaced apertures 19 and 20 which are formed in the door pillar 4. These outer reduced end portions of the pins may be relied upon to positively locate the door dovetail in a predetermined position on the door pillar 4 during installation of the device.

Rotatably mounted on the enlarged intermediate part of the upper dowel pin 14 is a contact member which includes an inner metal sleeve 21, a concentric, spaced outer metal sleeve 22 and an intermediate yieldable ring 23 which preferably comprises rubber or other suitable material. The yieldable element may be compressed between the inner and outer metal sleeves or it may be vulcanized between the latter.

A solid roller 24 is journaled on the intermediate portion of the lower dowel pin. This roller may be formed of metal or any other rigid material and it may have a different diameter than that of the upper roller or contact member. The peripheries of the upper and lower rollers, however, are spaced apart sufficiently to permit insertion of the tapered tongue 6 which has a substantially horizontal lower side and an inclined upper side.

When the door which carries the tongue 6 is closed, the tongue in passing between the rollers has rolling contact with the peripheries thereof and therefore excessive frictional resistance to closing of the door is obviated. The rigid lower roller 24 positively holds the free side of the door against downward movement preventing it from bumping against the lower part of the door frame structure. As the tongue 6 is inserted between the rollers it places the yieldable and resilient core of the upper contact member under compression. In this manner the tongue 6 is firmly gripped between the contact members and forcefully urged against the lower rigid contact member by the resilient upper roller. The provision of rolling contact between the tongue and the contact members minimizes friction therebetween and permits the resilient element 23 of the upper member to be placed under sufficient compression to firmly hold the tongue and the door to which it is attached against upward movement without excessively resisting opening or closing of the door.

In the form shown in Fig. 3 the general structure of the door dovetail is identical to that shown in Figs. 1 and 2 and corresponding parts of the device are designated by the same numerals but in place of the rigid contact element or roller 24 a yieldable roller 25, which is identical in construction to the yieldable roller shown in Figs. 1 and 2, is journaled on the lower dowel pin 15. With this construction both upward and downward movement of the tongue which is carried by the door is yieldably resisted. When the tongue is inserted between the rollers shown in Fig. 3 the yieldable cores thereof are placed under compression so as to effectively resist vibration of the door.

In the form of my invention, shown in Fig. 4, the casing 1′ of the door dovetail is substantially identical to the casing 1 illustrated in Figs. 1 and 2. This casing, however, is provided on its outer side with a partial closure comprising plates 26 and 27 which are rigidly riveted to the end flanges 2′ of the casing 1′ by centrally threaded members or nuts 3′. Threaded in the nuts 3′ are screws 28 which extend through apertures in a door pillar 4′ and firmly hold the casing in a predetermined position in a door frame structure.

The casing 1′ has a reinforcing bar 9′ on the outer surface of its wall 8′ and the side wall and reinforcing member are provided with spaced pairs of registering apertures. Upper and lower dowel pins 14′ and 15′ extend transversely of the casing, each having a reduced inner end portion received in the registering apertures of the side wall 8′ and reinforcing member 9′ and an outer reduced end portion 17′ and 18′, respectively seated in apertures 29 and 30 of the plates 26 and 27, respectively.

A yieldable roller which is substantially identical to the upper yieldable roller, shown in Fig. 2, is journaled on the upper dowel pin 14′. This roller includes inner and outer metal sleeves 21′ and 22′ and an intermediate yieldable core 23′ comprising resilient material such as rubber. Journaled on the lower dowel pin 15′ is a rigid contact member or roller 24′ having its periphery spaced from the periphery of the yieldable roller. With

this form of my invention the entire structure is self contained and the rolling contact members are supported independently of the door pillar upon which the device is mounted.

The door dovetail, shown in Figs. 5 to 8 inclusive, includes a sheet metal casing 31 of rectangular shape which is substantially identical to the casing shown in Figs. 1 to 4, inclusive. Flanges 32 are formed on the respectively opposite ends of the casing and are provided with rigidly attached nuts 33 having screw head bolts 34 by which the casing is secured to a door pillar 35 of a vehicle body door frame structure 36. The casing 31 has a side wall 37 on which is mounted a rigid plate or reinforcing member 38 having an aperture 39 registering with an aperture 40 in the side wall of the casing. A dowel pin 41 extends transversely through the casing 31 and has reduced portions at its respectively opposite ends, one extending through the registering apertures 39 and 40 of the side wall and reinforcing member, respectively and the other extending through an aperture 42 in the door pillar 35. A rigid roller or contact member 43 is journaled on the intermediate portion of the dowel pin 41.

Located in the upper end of the casing 31 is a yieldable cushion 44 preferably comprising resilient material such as rubber, and having a serrated upper extremity 45 bearing upon the upper end wall of the casing. The cushion 44 is held in place, and preferably held under an initial compression by a shiftable, hollow metal block 46 which is held against downward movement by a single pin 47 which extends through registering apertures in the plate 38 and side wall 37, respectively, the block being free to rock upon the pin 47.

The door pillar 35 is provided with a slot 48 through which is insertable a tongue or male member 49 that is carried by the free edge of a door 50. This tongue has a flange 51 rigidly secured to the door 50 by bolts 52 and it is adapted to pass between the roller 43 and the shiftable contact element 46 when the door is closed.

During insertion of the tongue 49 between the roller 43 and contact element 46, the lower side of the tongue which is substantially horizontal has rolling contact with the roller 43 and the upper side of the tongue, which is inclined, slides upon the contact member 46 urging the same upwardly against the action of the cushion 44. In this manner the compression of the cushion is augmented and the tongue is firmly clamped between the two contact elements so as to prevent movement of the door when closed relative to its surrounding structure.

Although specific embodiments of this invention have been herein shown and described, it will be understood that the invention may be effected in other forms and that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim as my invention:

1. In a door dovetail structure adapted to be mounted on a door pillar, a casing having transverse dowel pins protruding beyond one side thereof and receivable in apertures in said door pillar for locating said casing on said pillar, and a pair of spaced contact elements, one journaled on each dowel pin.

2. A door dovetail including a support, a resilient contact element rotatably mounted thereon, a rigid contact element rotatably mounted on said support and spaced from said resilient contact element, said elements being adapted to receive a tongue therebetween by rolling contact whereby to place the resilient element under compression.

3. A door dovetail comprising a lower rigid roller rotatably mounted in said casing having its periphery in registration with the horizontal side of a wedge shaped tongue adapted to be received by said dovetail, and an upper roller rotatably mounted in said casing having an inner rubber core and an outer periphery for receiving the inclined side of said tongue, said upper roller being adapted to firmly hold said tongue upon said lower roller and to prevent upward movement of said tongue relative to said door frame.

4. A door guide structure comprising a casing secured upon a door post, said casing having a back portion and a reinforcing plate disposed upon the back portion, a dowel extending through the plate and the back of the casing and having the forward end thereof supported in an opening in the door post.

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