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L. M. SEELY

2,532,040

TOGGLE BOLT  
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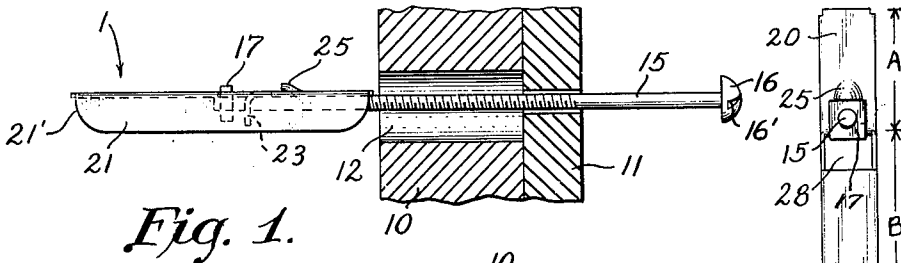


Fig. 1.

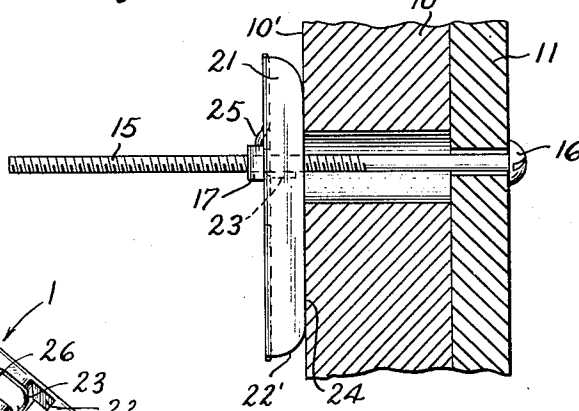


Fig. 2.

Fig. 2a.

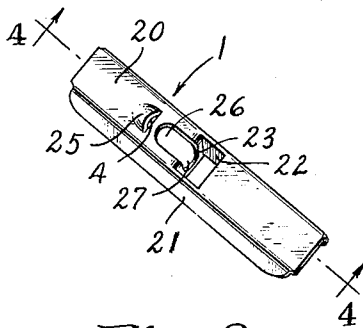


Fig. 3.

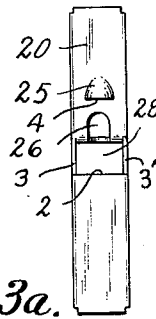


Fig. 3a.

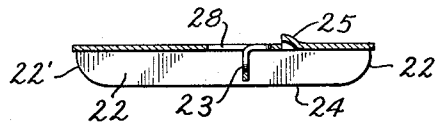


Fig. 4.

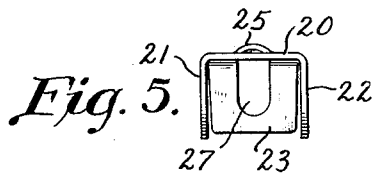


Fig. 5.

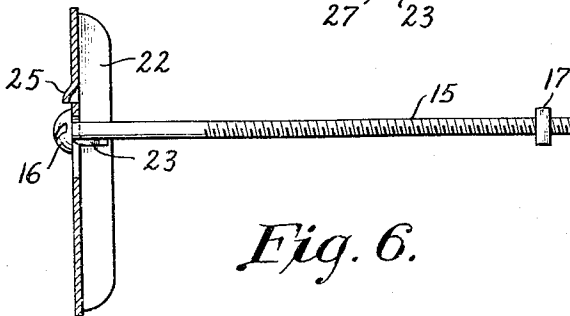


Fig. 6.

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## UNITED STATES PATENT OFFICE

2,532,040

## TOGGLE BOLT

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3 Claims. (Cl. 85—3)

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This invention relates to a toggle-belt construction that can be manufactured cheaply and economically, and more specifically to one in which the anchor member can cooperate interchangeably with either the head of an ordinary bolt or with the nut of such bolt, the bolt being adapted to be removably inserted within the anchor member. The bolt may be an ordinary stove bolt which may be sold in combination with the anchor member, or the anchor member may be sold separately, to be later combined with the bolt by the purchaser. The present toggle-bolt invention thus comprises the combination of the anchor member and the bolt as well as the anchor member which can be sold as a separate article.

The invention further relates to a toggle-link which has the maximum strength and efficiency with the minimum cross-section. It further relates to certain details of construction which will be more fully hereinafter described and claimed. In the accompanying drawing, I have shown an illustrative embodiment of my invention in which the same reference numerals refer to similar parts in the several figures.

Figure 1 is a vertical section through the support and the work to be supported showing the toggle-bolt in side elevation being inserted through an aperture in the support and work.

Figure 2 is a view similar to Figure 1 showing the work secured by the toggle-bolt in locked position.

Figure 2A is a rear elevational view of the toggle-bolt shown in Figure 1.

Figure 3 is a perspective view of the anchor member alone which cooperates with the bolt.

Figure 3A is a plan view of the anchor member shown in Figure 3.

Figure 4 is a sectional view taken on lines 4—4 on Figure 3.

Figure 5 is an end view of the anchor member shown in Figure 3, and

Figure 6 is a vertical sectional view of the anchor member showing a bolt assembled therewith with the head engaged therewith.

In the illustrative embodiment of this invention shown in the drawings, the toggle-bolt construction comprises an anchor member designated by numeral 1 and a removable bolt 15 adapted to cooperate therewith. The bolt may be of any suitable size and desired construction. Ordinarily, I use what is known as a stove bolt having at one end a head 16 provided with a groove 16' for engagement with a screw-driver and threaded at the other end and provided with

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a cooperating polylateral nut 17. These bolts may be sold combined either with the anchor member 1 or the anchor member may be sold separately.

The anchor member is preferably made of a single metal blank of suitable gauge sheet metal preferably of steel which is cut and stamped to produce an anchor member generally U-shaped in cross-section as shown in Figures 3 and 5. The anchor member is shaped so as to be provided with a pair of spaced parallel side walls 21 and 22 positioned at substantially right angles with a connecting wall 20 forming the bottom of the channel shaped anchor member. The ends 21' and 22' of the side walls are preferably curved or tapered as shown in the drawings. The bottom wall is cut along lines 2, 3 and 3' as shown in Figure 3A and bent inwardly of the channel portion at substantially right angles to the bottom wall 20 so as to provide a partition member 23. As a result of bending the partition member inwardly of the channel, a rectangular opening 28 is provided in the medial region of the bottom wall 20. An opening 26 is also provided in the bottom wall adjacent the opening 28 of suitable dimension to receive the bolt 15 therethrough. An opening 27 is also provided in the partition of suitable dimension to receive the bolt 15 therethrough. The openings 26 and 27 can be conveniently formed by punching out an opening in the flat blank so that when the partition member 23 is bent inwardly the two openings 26 and 27 will be properly located in communicating relation to each other as shown in Figure 3 for a purpose to be explained later. The openings 26 and 27 are preferably semi-circular in shape at the ends thereof for receiving the bolt 15.

The partition member 23 is positioned past the median point of the anchor bolt so that dimension A is less than dimension B as indicated in Figure 2A. This construction permits the anchor member to tilt by gravity on the bolt assembled therewith as will be explained hereinafter.

A small slit 4 is also provided adjacent the opening 26 in the rear wall 20 and the wall is pressed outwardly adjacent the slit to provide a small protuberance or stop element 25 for engaging a lateral face of the nut 17 as shown in Figures 2 and 2A.

The anchor member 1 is assembled for use with a bolt 15 by passing the end of the bolt through opening 26 and then positioning the nut 17 at the threaded end thereof. The bolt is then tilted so as to assume a horizontal position in alignment with the anchor member 1 as shown in

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Figure 1. When the bolt 15 is tilted into horizontal position it will pass from opening 26 to the communicating opening 27 in the partition member 23 and at the same time nut 17 will enter into opening 28 to assume the position shown in Figure 1.

The assembled anchor member and bolt in the extended position described can be readily inserted through an opening or aperture in the support 10 and work 11 desired to be attached thereto by the bolt. As soon as the anchor member passes through the aperture 10 to clear the rear face of the support 10 it will tilt by gravity to assume the position shown in Figure 2. In this position the bolt 15 will rest on the partition 23 and a lateral face of the nut 17 will engage the stop member 25 as shown in Figures 2 and 2A. The bolt is then turned by engaging a screwdriver with the head 16 until the work 11 is securely fastened to the support 10 in the position shown in Figure 2. It will also be noted that the full length of the free edges 24 of the side walls 21 and 22 will be brought into positive and frictional engagement with the rear face of the support 10. The anchor member thus securely holds the bolt in fixed position on the support.

If it is desired to have the threaded end of the bolt 15 to extend outwardly of the work 11 the bolt 15 can be readily inserted through the opening 26 in the anchor member 1 in the position shown in Figure 6 and the nut 17 can then be tightened against the work to retain same in the support. It is thus apparent that the anchor member can be assembled with a bolt in any desired relation depending upon the use desired.

The present invention is adapted for toggle-bolts of all sizes to carry any load. For any given load the present toggle construction requires a minimum size hole to be drilled through the support and work and yet provides great holding power because the anchor member acts as a spring beam across the opening of the hole. The partition member 23 serves to support the bolt 15 firmly on the anchor member and at the same time positions the bolt at right angles to the work. The nut 17 also rests fully with its flat face on the rear of the wall 20 so that full advantage is taken of the entire strut strength of the anchor member to resist the pulling force on the bolt 15 when it is tightened by means of the nut 17 on the work.

It will also be noted that in the present construction the opposed wall portions 21 and 22 are imperforate throughout, having no openings or cuts of any kind, so that the full strength of the metal blank is utilized in this portion of the anchor member where it is most needed to function as a strut for resisting the force exerted by the bolt. The free continuous edges 24 of the side walls 21 and 22 also frictionally engage for their full length with the rear face 10' of the support and thus provide positive bearing means for the anchor member so that the toggle bolt is firmly secured and positively retained in position after it is fastened in final position on the work.

Another advantage of the present toggle construction resides in being able to use with the anchor member any available bolt of proper size and diameter for insertion in the openings provided in the anchor member previously described.

The anchor member can be made from a single steel metal blank of suitable size and gauge by a single stamping operation at a minimum of cost and expense. The present invention thus provides a toggle-bolt construction that is simple

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yet surprisingly efficient and effective and which can be conveniently used in a number of alternative relations to support a member on walls, ceilings and other structural members which cannot normally receive and retain a bolt in the member itself.

I claim:

1. A toggle-bolt comprising an anchor member formed of a single blank of sheet metal and shaped into a U-shaped channel, said channel comprising a pair of opposed side walls extending for substantially the full length of said channel, a bottom wall connecting said opposed side walls and positioned therebetween, said bottom wall having a partition member positioned at right angles thereto inwardly of said channel member, a bolt-receiving opening adjacent said partition member for receiving a threaded bolt, a rectangular opening in said bottom wall adjacent said partition for accommodating a nut retained on said bolt and to pass therethrough, said partition being provided with an opening communicating with said bolt-receiving opening, said partition being positioned beyond the median portion of said bottom wall to permit the anchor member to swing downwardly by gravity from a horizontal position to a vertical position on a bolt passing through said bolt-receiving opening and to support said bolt at substantially right angles to said bottom wall.

2. A toggle-bolt comprising an anchor member formed of a single blank of sheet metal and shaped into a U-shaped channel, said channel comprising a pair of opposed side walls and a connecting bottom wall therebetween, said bottom wall having a partition member integral therewith and positioned at right angles thereto inwardly of said channel member, a semi-circular bolt-receiving opening adjacent said partition member for receiving a threaded bolt, a rectangular opening in said bottom wall adjacent said partition for accommodating a nut retained on said bolt and to pass therethrough, said partition being provided with a semi-circular opening communicating with said bolt-receiving opening, said partition being positioned beyond the median portion of said bottom wall to permit the anchor member to swing downwardly by gravity from a horizontal position to a vertical position on a bolt passing through said bolt-receiving opening and to support said bolt at substantially right angles to said bottom wall.

3. A toggle-bolt comprising in combination an anchor member formed of a single blank of sheet metal and shaped into a U-shaped channel, said channel comprising a pair of opposed side walls and a connecting bottom wall therebetween, said bottom wall having a partition member integral therewith and positioned at right angles thereto inwardly of said channel member, a bolt-receiving opening adjacent said partition member for receiving a threaded bolt, a bolt passing through said opening and having a nut retained at the end thereof, a stop member adjacent said bolt-receiving opening for engaging a lateral face of said nut, a rectangular opening in said bottom wall adjacent said partition for accommodating a nut in said hole to pass therethrough, said partition being provided with an opening communicating with said bolt-receiving opening, said partition being positioned beyond the median portion of said bottom wall to permit the anchor member to swing downwardly by gravity from a horizontal position to a vertical position on a bolt passing through said bolt-receiving opening and

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to support said bolt at substantially right angles  
to said bottom wall.

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