June 14, 1938. W. SHIPPEE ET AL 2,120,530

FASTENING DEVICE

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Fig.1.

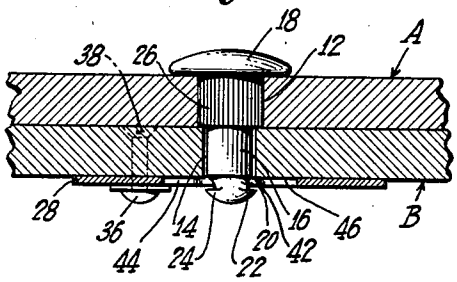


Fig.2.

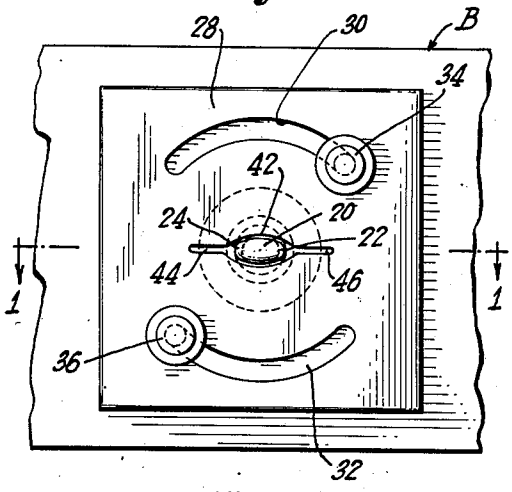


Fig.3.

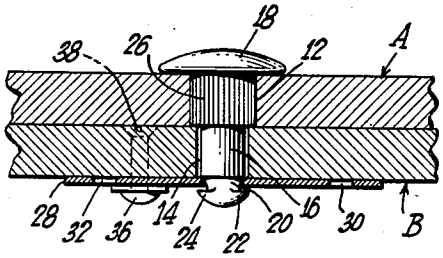


Fig.4.

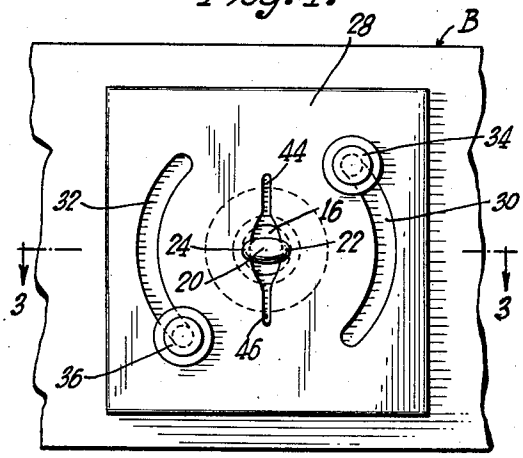


Fig.5.

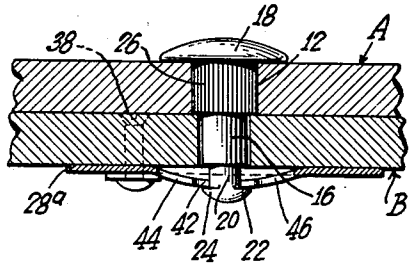
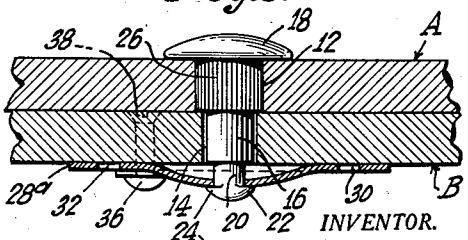


Fig.6.



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June 14, 1938. W. SHIPPEE ET AL 2,120,530

FASTENING DEVICE

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Fig. 7.

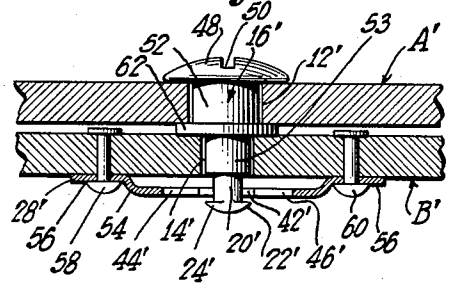


Fig. 8.

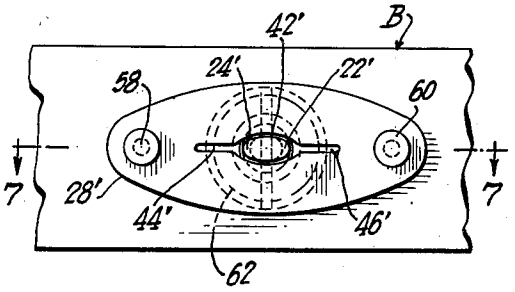


Fig. 9.

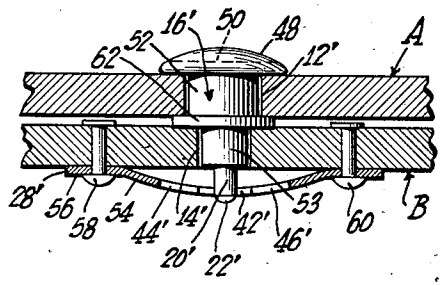


Fig. 10.

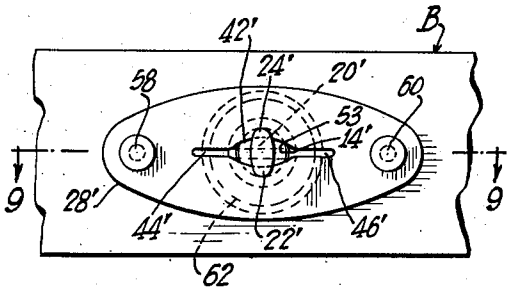


Fig. 11.

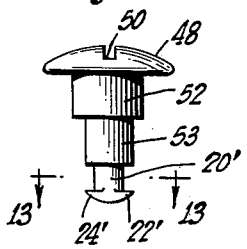


Fig. 12.

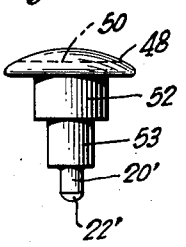


Fig. 13.



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FASTENING DEVICE

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Fig. 14.

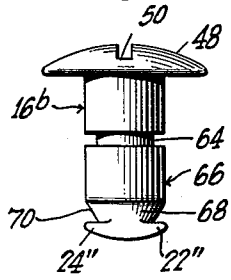


Fig. 15.

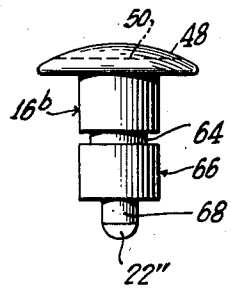


Fig. 16.

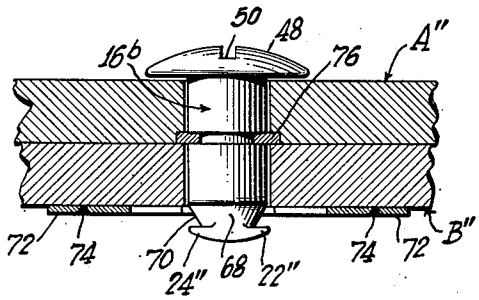


Fig. 17.

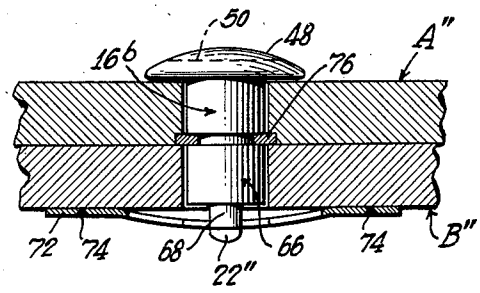


Fig. 18.

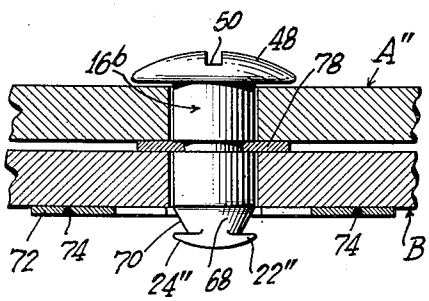
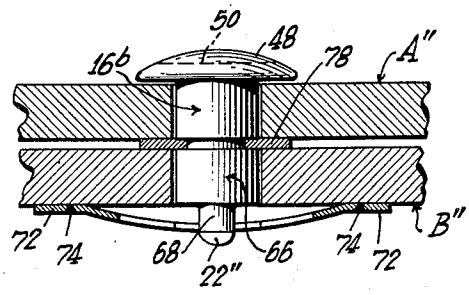


Fig. 19.



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Patented June 14, 1938

2,120,530

UNITED STATES PATENT OFFICE

2,120,530

FASTENING DEVICE

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Application October 30, 1936, Serial No. 108,423

18 Claims. (Cl. 24—221)

In accordance with the present invention, there is provided an improved form of fastening device for detachably fastening together separate parts or appurtenances, such as, for example, parts of aircraft, for instance parts of an aircraft cowling or other parts, the securing of automobile license plates to their brackets, and for many other purposes.

One of the objects of the invention is to provide a simple construction of a separable fastener, the parts of which are assembled readily and which are manipulatable very easily and conveniently into both locked and releasable positions.

A further object of the invention is to provide a fastening device wherein the locking and releasing of the parts thereof is obtained by a single manipulation, such as a turning movement, of one of the parts of the device relative to the remaining parts which are secured in fixed position on one of the members to which attachment is to be made.

Further objects and advantages of the present improved construction will become apparent as the description proceeds, and the features of novelty will be pointed out in particularity in the appended claims; and the invention accordingly comprises the features of construction, combination of elements and arrangement of parts, which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the claims.

In general terms, the present invention embraces a separable fastener which is made up of two principal parts, namely, a pressure member, and a pressure receiving member, the latter being adapted to be brought into a tightly gripping locking engagement with the former by a turning movement of one or the other of the members, the non-turnable member being fixedly mounted so that a gripping locking pressure may be exerted between the members when the turning movement brings them into locking position.

The pressure-receiving member may be in the form of a plate which may be either flat or concave, the concave side in the latter instance, being towards the parts being fastened together; and this plate is adapted to be secured to one of the members to be fastened together, either by means of a mounting which will permit the plate to be turned a sufficient distance relative to the cooperating pressure member, which is itself rigidly and fixedly mounted, or the plate may be rigidly and fixedly secured in position, in which event the cooperating pressure member is turnable.

In any event, the interlocking of the parts is obtained by providing the plate with a substantially oval or elliptical opening at approximately its mid-portion, the said opening being extended into oppositely disposed and oppositely extending elongated slots.

The pressure member comprises a bolt terminating in a stud which is eccentrically shaped and which is provided with a pair of oppositely disposed and oppositely extending lugs. The stud and the lugs are adapted to fit into the opening in the plate, so that when either member is turned relatively to the other, the longer axis of the stud is brought into engagement with the shorter axis of the opening, so that the sides of the opening and slots will become spread apart, with the lugs tightly gripping the underside of the plate, and when so engaged the spreading action of the plate opening creates a bulging or arching action in the plate as to pull on the engaging lugs as well as to grip them, thereby holding the parts of the fastening device, as well as the parts of the equipment to be secured together in very tight locking relation; and this locking relation is effected by imparting only a quarter-turn to the movable member.

The invention will be more readily understood by reference to the accompanying drawings which show several forms which the device may take, it being understood that the specific forms of the invention are not limited, necessarily, to these illustrated modifications, but that the construction of the device is adapted to be varied in many other ways, without departing from the inventive concept, as will become apparent.

In the drawings,

Fig. 1 represents a sectional elevation of the parts of the device in assembled relation for holding together two plates or other suitable members which are desired to be fastened together, the view showing a flat form of locking plate, however with the parts of the locking device still in separable relation, the view being taken on the line 1—1 of Fig. 2.

Fig. 2 is a bottom view of the assembly of Fig. 1, showing a mounting of the locking plate for turning movement.

Fig. 3 is a sectional elevation similar to Fig. 1 but showing the parts of the locking device turned into locking position, the view being taken on the line 3—3 of Fig. 4.

Fig. 4 is a bottom view of the parts as shown in Fig. 3, the locking plate being shown as being turned into locking position.

Fig. 5 is a sectional elevation similar to Fig.

1, but showing a dished or concave locking plate.

Fig. 6 is a sectional elevation similar to Fig. 3, but showing also a dished or concave locking plate which has been turned into locking position.

Fig. 7 is a sectional elevation showing a modification wherein the locking plate is concave and is secured against turning, while the cooperating pressure or stud member is turnably mounted relative to the locking plate, the parts in the view being illustrated as being in releasable position, the view being taken on the line 7—7 of Fig. 8.

Fig. 8 is a bottom view of the assembly as shown in Fig. 7.

Fig. 9 is a view similar to Fig. 7 but showing the pressure stud turned into locking relation with the plate, the plate being shown as being deformed in an exaggerated manner under the pressure exerted by the locking movement of the pressure stud, the view being taken on line 9—9 of Fig. 10.

Fig. 10 is a bottom view of the assembly as shown in Fig. 9.

Fig. 11 is an illustration of the pressure member or bolt of the device, the view showing the configuraton of the locking stud of the bolt.

Fig. 12 is a view of the bolt of Fig. 11, taken at right angles to Fig. 11.

Fig. 13 is a sectional plan view taken on the line 13—13 of Fig. 11, the view showing the lugs on the end of the studs.

Fig. 14 is an elevation of a modified form of pressure member or bolt.

Fig. 15 is a view similar to Fig. 14, but taken at right angles to Fig. 14.

Fig. 16 is a sectional elevation similar to Fig. 7 but employing the modified pressure bolt of Fig. 14, in combination with a flat locking plate fixedly mounted on its work-piece, the parts being shown in releasable position.

Fig. 17 is a view similar to Fig. 16, but showing the parts in locking position.

Fig. 18 is a view similar to Fig. 16, but illustrating a different form of washer used in connection with the pressure bolt.

Fig. 19 is a view similar to Fig. 17, with the washer of Fig. 18 used in place of the washer of Fig. 17.

Referring more particularly to the drawings, A and B represent fragments of any desired parts which are to be secured together.

The part A is provided with a hole 12 therethrough, and the part B is provided with a hole 14, these holes being adapted to be brought into registry with each other for receiving a bolt 16 which is passed through the hole. The bolt 16 is provided with a head 18 and a stud 20, this stud 20 being of an eccentric shape, that is to say it is formed with one axis longer than the other. The stud 20 terminates in oppositely extending lugs 22 and 24, which extend from the stud 20 along the longer axis of the stud.

The bolt 16 is secured in position in the part A so that the bolt cannot turn with respect to these parts, and for this purpose, a portion 26 of the shank of the bolt may be knurled.

On the part B and on the outside surface thereof, there is positioned a locking plate 28. This plate 28 is shown as being provided with arcuate slots 30 and 32, into which extend rivets 34 and 36, the heads of which engage the outside surface of the locking plate 28, and the shanks of which are shown as being countersunk in the part B, as designated at 38.

The mounting of the locking plate 28 on the rivets 34 and 36 is such that the plate may be given a quarter-turn relative to the bolt 16, as will be seen from Figs. 3 and 4.

The eccentric stud 20 of the bolt 16 is received in the opening 42 in the plate 28, this opening 42 being generally elliptical or oval.

Extending from this opening 42 and coincident with the longer axis of the opening are elongated slots 44 and 46, the arrangement of the parts being such that when the pressure bolt and the plate are brought into assembled position, the stud 20 of the bolt 16 will enter the opening 42 in the plate 28, and the under side of the lugs 22 and 24 will be substantially flush with the outside surface of the plate 28, as will be seen from Figs. 1 and 2.

Now, when the bolt and plate are brought into locking position, by imparting a quarter-turn to the plate 28, as shown in Figs. 3 and 4, the opening 42 in the plate 28 will be brought at substantially right angles to the stud 20 of the stationary bolt 16, thereby effecting a spreading action on the opening 42 and the slots 44 and 46, causing the latter to open as will be clearly seen from Fig. 4. The resulting distortion of the plate 28 produces a very heavy pressure between the stud 20 and the opening 42 in the plate 28, thereby producing a gripping engagement between the parts so that the members A and B will be tightly secured together in a firm interlock.

In Figs. 5 and 6, there is shown a similar arrangement, but in which the locking plate 28 has been modified as indicated at 28a so as to present a concave surface to the member B to which the plate is secured. This results in a still more powerful locking engagement between the parts when the plate 28a is turned, the spreading of the opening and the slots 44 and 46, as described above in connection with Figs. 1 to 4 inclusive, with consequent deformation of the plate to tend to cause a further bulging in the plate, will produce an increased grip between the plate 28a and the lugs 22 and 24 of the stud 20 of the pressure bolt 16.

Also, from Figs. 5 and 6 it will be seen that where the locking plate 28a is concave, it is provided with a flat portion around its perimeter, in which flat portion the arcuate slots 30 and 32 are located for engaging with the rivets 34 and 36.

Figs. 7 to 10 inclusive show a form of fastener in which the bolt is shown as being turnably mounted, with the locking plate immovably fixed. A concave locking plate is shown.

In accordance with these views, a pair of work pieces A' and B' are to be fastened together. The pieces A' and B' are provided with registering holes 12' and 14' for receiving the bolt 16', having a head 48 which is provided with a groove 50 for receiving a screw driver or other tool adapted to turn the bolt 16' in the locking plate. The shank portion 52 of the bolt 16' is smooth in this instance but the stud portion 20' of the shank is eccentrically shaped as has been described above in connection with the stud 20; and like the stud 20, the stud 20' is provided with lugs 22' and 24' extending from the stud 20' in line with the longitudinal axis of the stud.

The locking plate 28' has a concave portion 54 and a flat marginal or flange portion 56 which is attached to the work piece B' either by rivets, such as those indicated at 58 and 60, or the plate 28 may be spot welded to the work piece B'.

A washer 62 is shown as being interposed between the plates A' and B' in Figs. 7 and 9, and around the bolt 16', this washer being sufficiently

large to form a firm seat for the parts A' and B' when they are locked together. This washer is shown as being provided in view of the rivets 58 and 60 extending all the way through the piece B', so that the piece A' will not be clamped, possibly unevenly, onto the rivet ends. The washer may be omitted, however, if desired, and the rivets may be countersunk as in Figs. 1 and 3.

The stud 20' is extended into the hole 42' in the locking plate 28', this hole corresponding to the hole 42 described above. Slots 44' and 46' extend from the hole 42', and are expanded when the bolt 16' is turned into locking position, as is indicated in Fig. 10, the pressure resulting in this deformation tending to increase the concavity of the locking plate 28', thus forcing the plate more tightly against the lugs 22', 24', thereby increasing the tightness with which the pieces A' and B' are pressed together; although if it be desired to do so, a flat plate may be substituted for the concave plate of Figs. 7 and 9, and if desired, the washer 62 may be omitted, as mentioned above, in which event the rivets 58 and 60 preferably are countersunk.

It will be seen that the shank of the bolt is made up of a plurality of sections as are indicated by the sections 52, 53 and the stud 20'. The section 53 is of smaller diameter than the section 52, the latter defining, therefore, an annular shoulder which is adapted to engage the washer 62 or the work-piece B' if the washer is omitted. The stud 20' is sufficiently small to enter into the opening 42' in the plate, but it enlarges towards the section 53, so as to be pressed into pressure engagement therewith as turning between the plate and the bolt is effected so as to cause the expansion of the opening incident to the turning, as has been described above; and whereas the sections 52 and 53 are round in cross-section, the stud 20' is elliptical or eccentric in cross-section, as has been described above.

It will be understood, of course, that the deformation of the plate does not exceed the elastic limit of the metal composing the plate, so that upon release of the locking engagement the plate will restore itself substantially to its former condition.

Figs. 14 to 19, inclusive, show a modified form of the fastening device of the invention securing together two parts A'' and B''. Pressure bolt 16b is provided with a groove 64 intermediate the ends of shank 66, and stud 68 is tapered, as indicated at 70, the taper converging towards the locking lugs 22'' and 24'' so as to engage closely the surface of the locking plate 72. Plate 72 is normally substantially flat, as shown in Fig. 16, and is illustrated at spot-welded at 74, 74 to the part B''.

As shown in Figs. 16 and 17, a spring washer 76 is shown as having been inserted in the groove 64 to take the wear incident to the turning of the bolt 16b to lock and to release the parts.

Now, when the bolt 16b is turned into locking position relative to the plate 72, the tapered side 70 of the stud 68 exerts a strong outward thrust on the plate 72, thereby causing the plate 72 to flex outwardly, as indicated in Figs. 17 and 19.

In order for the parts A'' and B'' to lie flatly together, the part A'' may have the washer 76 countersunk therein, as will be noted from Figs. 16 and 17.

In Figs. 18 and 19, a wide washer 78 of rubber or fiber replaces the spring washer 76 of Figs. 16 and 17, this washer 78 being similar to the washer 62 of Figs. 7 and 9. With this exception, the parts of Figs. 18 and 19 are the same as in Figs. 16 and 17.

It will be understood that the stud-receiving opening in the plate 72, and the slots extending therefrom are as described above, and are expanded in an entirely similar manner when the stud 68 is turned into locking position, so that further description of this action is unnecessary.

From the foregoing description, it will be understood that the invention is not limited to the specific details of construction as are herein specifically illustrated and described, but it will be apparent that such details are subject to various modifications which will become apparent readily to one skilled in the art, without departing from the spirit of the invention; and it will be understood, therefore, that it is intended and desired to include within the scope of the invention such modifications and changes as may be necessary to adapt it to varying conditions and uses. It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention, which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. A fastening device comprising separate co-engaging fastening elements, means immovably securing at least one of the said elements to a part to be fastened to a second part, means enabling operative engagement to be established between the said fastening elements, and locking means on one of the elements adapted to become interlocked with the other element upon relative turning movement between the elements, the said locking means including eccentrically-shaped means adapted to cause an expansion of the co-engaging element incident to a turning movement between the elements, whereby one of the said elements is forced into the co-engaging element to expand the latter by the said turning movement.

2. A fastening device comprising separate co-engaging fastening elements, means immovably securing at least one of the said elements to a part to be fastened to a second part, one of the said elements entering into the co-engaging element and having means for causing an expansion of the co-engaging element incident to a turning movement between the elements, whereby the elements are forced into interlocking engagement to hold the parts together, and means on the end of the entering element adapted to have interlocking engagement with the co-engaging element by the turning movement of the former.

3. In a fastening device, the combination with parts to be fastened together, of co-engaging fastening elements for the parts, means immovably engaging one of the said elements to its part, the other of the said elements being turnable relative to the parts, one of the said elements entering its cooperating element and having an eccentrically shaped part adapted to expand the cooperating element upon turning the elements relative to each other, and locking lugs on the end of the entering element adapted to have interlocking engagement with the co-engaging element by a turning movement between the elements.

4. In a fastening device, the combination with parts to be fastened together, of a pair of co-engaging fastening elements for the parts, one of the said elements being mounted on one of the parts, the other of the said fastening ele-

ments extending through the parts and its co-engaging fastening element, the latter element being provided with means for expanding its co-engaging element and to exert locking pressure thereon responsively to a turning movement of one of the elements relative to the other.

5. In a fastening device, the combination with parts to be fastened together, of a pair of co-engaging fastening elements for the parts, one of the said elements comprising a plate having an opening therethrough, the other of the said elements projecting through the parts and through the opening in the said plate and comprising an eccentrically shaped stud adapted to expand the opening in the plate responsively to turning movement of one of the elements relative to the other, and means on the said stud for exerting locking pressure on the said plate upon turning of the said stud relative to the plate, thereby releasably locking together the said elements and the parts.

6. A fastening device comprising separate co-engaging fastening elements, means immovably securing one of the said elements to a part to be fastened to a second part, one of the said elements comprising a plate having an opening therethrough and mounted on one of the parts, the other of the said elements projecting through the parts to be secured together and through the opening in the plate and comprising means for expanding the said opening in the plate element responsively to turning movement of the elements relative to the other, and means on the said last mentioned means for exerting locking pressure on the said plate upon turning of the said last mentioned means relative to the plate, thereby releasably locking together the said elements and the parts.

7. A fastening device comprising a pair of separate co-engaging fastening elements, means immovably securing one of the said elements to a part to be fastened to a second part, one of the said elements comprising a dished plate having an opening therethrough and mounted on one of the parts with its concave surface towards the said part, the other of the said elements projecting through the parts to be secured together and terminating in an eccentrically shaped stud adapted to enter the opening in the said plate when the said elements are in releasable position and to expand the said opening with consequent deformation of the plate responsive to a turning movement between the said elements, and lugs on the said stud adapted to engage the outward surface of the plate to retain the stud in the said opening and to forcibly grip the plate upon the deformation thereof incident to the turning movement between the said elements.

8. A fastening device comprising a pair of separate co-engaging fastening elements coacting with parts to be fastened together, one of the said elements comprising a plate having an opening therethrough and mounted on one of the parts, the other of the said elements being a bolt extending through the parts to be fastened together and through the opening in the plate, and means on the said bolt for exerting locking pressure on the said plate upon turning of the bolt relative to the plate, and means on the bolt adapted to exert an expanding force on the plate to lock the parts together responsive to a relative turning movement between the plate and the bolt.

9. A fastening device comprising a pair of separate, co-engaging fastening elements coacting with parts to be fastened together, one of the said elements comprising a plate having an opening therethrough and mounted on one of the parts, and the other of the said elements being a bolt extending through the parts to be fastened together, the said bolt having its shank terminating in a stud having one transverse axis longer than another transverse axis in the same plane and adapted to project through the opening in the plate, the said opening being longer in one direction than in another to enable the stud to enter the said opening, the long portion of the said stud being adapted to tightly engage the sides of the opening across the short dimension of the opening upon one of the said elements being turned relative to the other so as to exert an expanding force on the said opening, and means on the said stud for exerting locking pressure on the said plate upon turning of the said stud relative to the plate thereby releasably clamping together the said elements and parts.

10. A fastening device comprising a pair of separate, co-engaging fastening elements co-acting with parts to be fastened together, one of the said elements comprising a plate having an opening therethrough and mounted on one of the parts, and the other of the said elements being a bolt extending through the parts to be fastened together, the said bolt having its shank terminating in a stud having one transverse dimension longer than the dimension transversely thereof in the same plane and adapted to project through the opening in the plate, the said opening also being longer in one direction than in the direction transverse thereof, the said bolt having another portion of its shank knurled to grip relatively immovably the parts through which the bolt is inserted, mounting means for the plate enabling the plate to be turned relative to the bolt to engage the short dimension of the opening in the plate with the long dimension of the stud, and means on the said stud for exerting locking pressure on the said plate upon turning of the said stud relative to the plate thereby releasably clamping together the plate and stud and the parts to be fastened together.

11. A fastening device comprising a pair of separate co-engaging fastening elements coacting with parts to be fastened together, one of the said elements comprising a dished plate having an opening therethrough and mounted on one of the parts with its concave surface facing the said part, and the other of the said elements being a bolt extending through the parts to be fastened together, the said bolt having its shank terminating in a stud having one transverse dimension longer than the dimension transversely thereof in the same plane and adapted to project through the opening in the plate, the said opening also being longer in one direction than in the direction transverse thereof, means enabling a relative turning movement between the plate and bolt whereby the short dimension of the opening of the plate is brought into engagement with the long dimension of the stud to cause a gripping therebetween with consequent expansion of the opening and increase in the concavity of the plate, and lugs on the stud adapted to press forcibly against the outside surface of the plate incident to deformation thereof upon the clamping of the stud in the opening, thereby releasably interlocking together the bolt and plate and the parts to be secured.

12. A fastening device comprising a pair of separate, co-engaging fastening elements coact-

ing with parts to be fastened together, one of the said elements comprising a plate having an opening therethrough and mounted on one of the parts, and the other of the said elements being a bolt extending through the parts to be fastened together, the said bolt having its shank terminating in a stud having one transverse dimension longer than the dimension transversely thereof in the same plane and adapted to project through the opening in the plate, the said opening also being longer in one direction than in the direction transversely thereof, slots extending oppositely from the ends of the elongated opening, means on the bolt for securing the bolt relatively immovably in the parts to be secured together, mounting means for the plate enabling the plate to be turned relative to the bolt so as to force the short dimension of the opening of the plate over the long dimension of the stud, thereby producing a yielding of the plate through expansion of the said opening and slots, and means on the stud for gripping the plate in response to the yielding thereof to secure the plate and bolt in releasable locking position.

13. A fastening device comprising a pair of separate, co-engaging fastening elements coacting with parts to be fastened together, one of the said elements comprising a plate having an opening therethrough and mounted on one of the parts, and the other of the said elements being a bolt extending through the parts to be fastened together, the said bolt having its shank terminating in a stud having one transverse dimension longer than the dimension transversely thereof in the same plane and adapted to project through the opening in the plate, the said opening being elongated and having slots extending from the ends thereof coincident with the long axis of the opening, means on the bolt for enabling the bolt to be turned relative to the parts to be secured together and to the plate, means immovably securing the plate to its part, whereby turning the bolt forces the long dimension of the stud into the short dimension of the opening, thereby forcing the plate to yield through spreading of the said opening and slots, and locking lugs on the stud for gripping the plate in response to the yielding thereof to secure the plate and bolt in releasable locking position.

14. A fastening device comprising separate co-engaging fastening elements, means securing at least one of the said elements to a part to be fastened to a second part, means enabling operative engagement to be established between the said fastening elements, the said elements being adapted to become interlocked upon relative turning movement between the elements, and one of the said elements comprising locking means projecting outwardly and transversely from one end of one of the elements and operatively engaging the underside of the other of the fastening elements, the said element having a portion eccentrically shaped to exert a bulging force on the other element responsively to turning movement between the elements to locking position, thereby releasably pressing the said parts together.

15. A fastening device comprising separate co-engaging fastening elements, one of the said elements comprising a spring plate having an opening therein, the second of the said elements being applicable for turning movement to a part to be fastened to a second part which may be engaged by the said spring plate, the said second element projecting through the opening in the said spring plate, the said second element being provided with oppositely disposed and oppositely extending lugs adapted to grip tightly the underside of the said plate responsively to turning movement between the fastening elements into locking position, and means on the said second element for creating an arching or bulging action in the plate as the fastening elements are turned into fastening position, the bulging action being in a direction to cause the plate to pull on the engaging lugs as well as to grip them, thereby securing tightly together the fastening elements and the parts to be fastened.

16. A fastening device comprising a pair of separate, co-engaging fastening elements, one of the said elements comprising a plate having a slotted opening therethrough, the other element comprising a bolt having a stud adapted to enter the said opening, the said stud being of eccentric configuration for closely engaging the plate upon a relative turning between the plate and bolt to bring the same into locking position, thereby causing a bulging action in the plate, and oppositely disposed and oppositely extending lugs on the said stud for gripping the underside of the said plate responsive to the said bulging action in the plate, which action expands the plate against the lugs incident to turning movement between the bolt and plate.

17. A fastening device comprising a pair of separate, co-engaging fastening elements coacting with parts to be fastened together, one of the said elements comprising a plate having a slotted opening therethrough, and the other of the said elements being a bolt having its shank terminating in a stud adapted to project through the opening in the plate, the said stud being tapered to engage the plate and eccentric in cross section to exert a flexing force on the plate incident to the bolt and plate being brought into locking position relative to each other, and locking lugs on the end of the stud extending transversely thereof and engaging the underside of the plate to act on the said plate to resist the said flexing force, the plate being thereby clamped against the locking lugs.

18. A fastening device comprising separate co-engaging fastening elements, one of which is immovably positioned with respect to a part to be fastened to a second part, means enabling operative engagement to be established between the said fastening elements, and locking instrumentalities comprising eccentrically-shaped means and oppositely disposed and oppositely extending locking lugs on one of the elements adapted to become interlocked with the other element upon relative turning movement between the elements, whereby one of the said elements is forced into the co-engaging element, the said eccentrically-shaped means expanding the said co-engaging element outwardly against the said lugs by the said turning movement.

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