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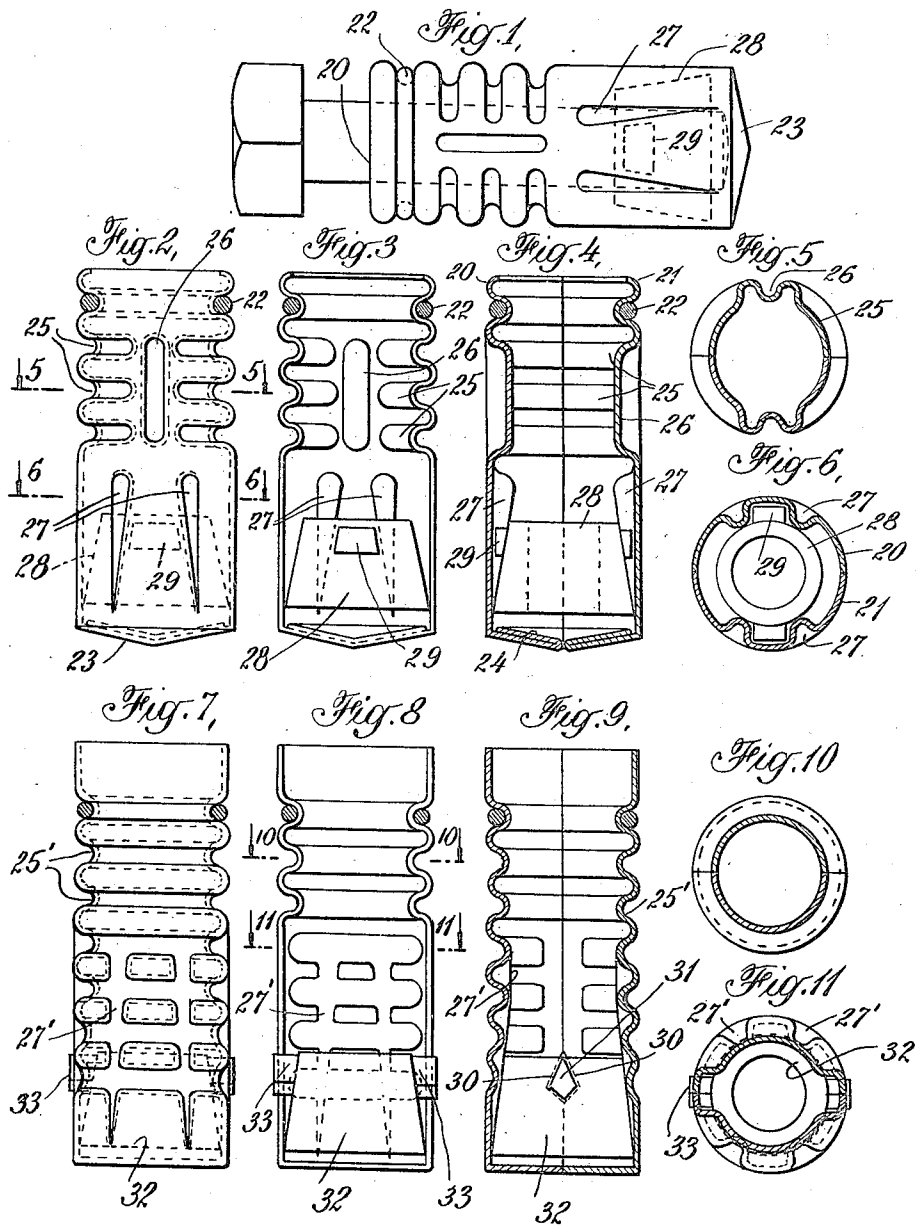
1,474,980

J. E. OGDEN

EXPANSION SHIELD

Filed Aug. 11, 1921

2 Sheets-Sheet 1



Inventor

John Edward Ogden

By *his* Attorney

E. W. Marshall

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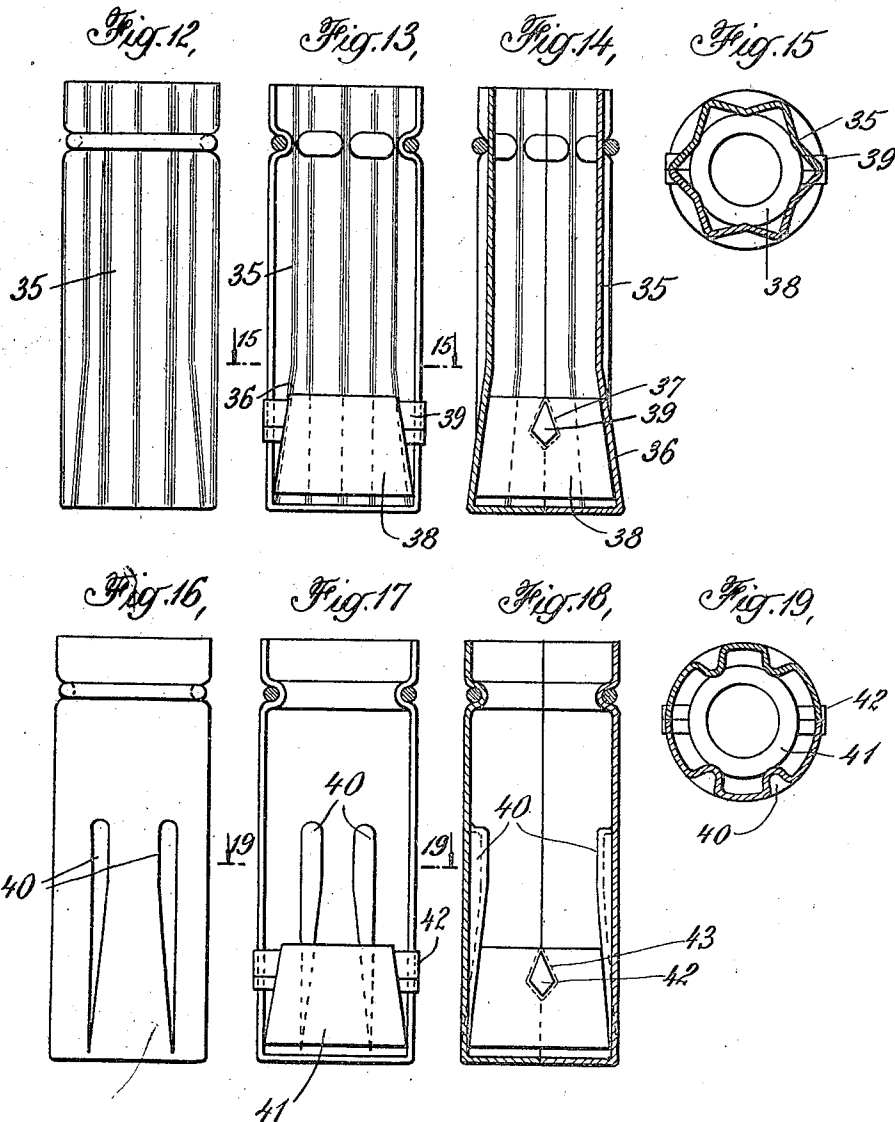
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UNITED STATES PATENT OFFICE.

JOHN EDWARD OGDEN, OF MOUNTAINVILLE, CORNWALL, NEW YORK.

EXPANSION SHIELD.

Application filed August 11, 1921. Serial No. 491,364.

To all whom it may concern:

Be it known that I, JOHN EDWARD OGDEN, a citizen of the United States, and a resident of Mountainville, town of Cornwall, Orange County, and State of New York, have invented certain new and useful Improvements in Expansion Shields, of which the following is a specification.

This invention relates to bolt anchors and more particularly to expansion shields used in anchors employed in walls of brick, stone, cementitious or other material not adapted to directly receive a threaded bolt.

Expansion shields which have closed end portions for receiving the thrust of a bolt are termed bottom bearing shields.

One of the objects of the invention is to provide a bottom bearing sheet metal expansion shield that will be strong in construction and will have a firm and a positive gripping effect.

Another object of the invention is to provide an expansion shield of the type described that may be economically manufactured.

Further objects of the invention will appear as the description proceeds.

Briefly stated the objects above outlined are attained in the present instance by a sectional sheet metal expansion shield comprising a plurality of stampings each section having a bottom preferably reinforced and having longitudinally and transverse integral ribs formed therein.

Referring to the drawings:

Fig. 1 is an elevational view of a bolt anchor having an expansion shield constructed in accordance with my invention.

Fig. 2 is an elevational view of the shield shown in Fig. 1.

Fig. 3 is an elevational view of one of the sections of the shield and the expanding nut shown in Fig. 1.

Fig. 4 is an elevational sectional view taken at right angles to Fig. 3.

Figs. 5 and 6 are sectional views taken substantially on lines 5—5 and 6—6 of Fig. 2.

Fig. 7 is an elevational view of another form of shield constructed in accordance with my invention.

Fig. 8 is an elevation of one section of the shield shown in Fig. 7, the expanding nut being shown in the shield section.

Fig. 9 is a sectional elevation of the

shield shown in Fig. 7 taken at right angles to Fig. 8.

Figs. 10 and 11 are sectional views taken substantially on lines 10—10 and 11—11 of Fig. 8.

Fig. 12 is an elevational view of another form of shield constructed in accordance with my invention.

Fig. 13 is an elevation of one of the sections of the shield shown in Fig. 12 with the expanding nut.

Fig. 14 is a sectional elevation of the shield shown in Fig. 12 taken at right angles to Fig. 13.

Fig. 15 is a sectional view taken substantially on line 15—15 of Fig. 13.

Fig. 16 is an elevational view of another form of shield constructed in accordance with my invention.

Fig. 17 is an elevation of one section of the shield shown in Fig. 16 with the expanding nut.

Fig. 18 is a sectional elevation of the shield shown in Fig. 16 taken at right angles to Fig. 17 and

Fig. 19 is a section of the shield shown in Fig. 16 taken substantially on line 19—19 of Fig. 17.

Referring first to Figs. 1—6 inclusive, the shield comprises a plurality of sections 20, 21 preferably held together adjacent their outer ends by split ring 22.

Each section is formed from a sheet metal stamping and is provided with a closed end 23, the ends of the sections registering and forming a closed end for the shield when they are clipped together. As shown in Fig. 4 the metal at the closed ends of the sections may be folded over or bent back upon itself as indicated at 24 to form a reinforcement to take the thrust to the bolt used in connection with the shield to form the anchor.

Each section has also formed integral therewith a plurality of transverse ribs 25 and longitudinal ribs 26, these ribs materially strengthening the shield and also effecting a firm and positive gripping of the shield with the material in which it is used.

The plurality of pairs of longitudinally extending ribs 27 is formed in each section and as shown particularly in Figs. 2 and 3, these ribs are tapered with respect to each other converging toward the outer end of the shield and diverging toward the closed end.

Each of the ribs 27 is also tapered longitudinally as shown in Fig. 4, the point of the rib extending toward the closed or bottom end thereof and the rib becoming wider toward the opposite end of the shield.

A nut is used in this type of shield for the purpose of expanding the shields or spreading the sections and in this instance the nut 28 is tapered longitudinally and is provided with outwardly projecting portions 29 adapted to be positioned between the rib 27 of the respective pairs.

The projections 29 are also tapered in a manner to correspond with the taper between the ribs 27.

The shield illustrated in Figs. 1-6 inclusive operates as follows: When the bolt is turned the point thereof will travel through the nut and obtain a seat or bearing on the bottom of the shield. Further rotation of the bolt will result in the nut traveling toward the head of the bolt or longitudinally of the shield and due to the fact that the nut is tapered, the outer surface of the nut will engage the tapered ribs 27 and will spread the shield sections expanding them into engagement with the wall of the opening in which the anchor is positioned.

Referring now to Figs. 7-11 inclusive, the shield illustrated therein comprises a plurality of sheet metal stampings having transverse ribs 25' and longitudinal ribs 27' similar to the corresponding ribs in the embodiment just described. In this instance, however, a part of the transverse ribs is intersected by the longitudinal ribs 27', this being clearly shown in Figs. 7 and 8.

In this form of the invention also the shield sections have formed therein notches 30, these notches being formed at the adjoining edges and registering when the sections are clipped together to form a V-shaped opening 31. A nut 32 tapered longitudinally in a manner similar to the nut 28 in the other embodiment is positioned in the shield. The nut 32 has formed thereon or secured thereto outwardly extending projections 33 shaped to conform to the openings 31 between the shield sections.

The shield shown in Figs. 7-11 inclusive is expanded by the longitudinal travel of the nut 32, the tapered nut engaging the ribs 27 to force the sections apart and also the wings or projections 33 will separate the sections by wedging themselves between the edges of the sections as the nut travels.

Figs. 12-15 inclusive illustrate another form of the invention in which each section has formed therein a plurality of longitudinally extending ribs 35 each rib being tapered at its lower end as shown at 36, the narrowest portion of the rib being disposed at the closed or bottom end of the shield. As in the form of the invention shown in Figs. 7-11 a V-shaped opening 37 is formed

between the shield sections and a tapered nut 38 is provided with outwardly extending wings or projections 39 adapted to fit into these openings and expand the shield.

In Figs. 16-19 inclusive another form of the invention is shown and in this form the sections have longitudinal ribs 40 corresponding to the ribs 27 shown in the first form of the invention described. A tapered nut 41 coacts with the shield and expands the sections and this nut has wedge shaped projections 42 adapted to fit in openings 43 between the sections.

In each of the embodiments of the invention described it will be noted that the projections on the nut in addition to what spreading action they may have prevent the nut from turning as it is fed longitudinally on the bolt.

From the above description it will be seen that an expansion shield has been designed that will be rigid in construction and may be firmly locked in the wall or other structure in which it is used. Since the shield is formed from a sheet metal stamping it may be very economically manufactured and the transverse ribs materially strengthen the shield and the longitudinal ribs in addition to adding strength also coact with the tapered nut to expand the shield.

Although certain specific embodiments of the invention have been particularly illustrated and described, it will be understood that the invention is capable of further modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention as expressed in the following claims.

What I claim is:

1. In combination, a sectional sheet metal expansion shield having one end closed and having longitudinal, spaced ribs in each section of the shield, and a nut having portions disposed between said ribs.
2. In combination, a sectional sheet metal expansion shield having one end closed and having longitudinal tapered spaced ribs and a nut having outwardly tapered side portions disposed between said ribs.
3. In combination, a sectional sheet metal expansion shield having one end closed and having longitudinal, tapered, spaced ribs in each section of the shield, and a nut having tapered portions disposed between said ribs.
4. In combination, a sheet metal expansion shield comprising a pair of sections, closed at one end, a pair of spaced, longitudinal, tapered ribs formed in each section and a nut having a projecting, tapered portion disposed between the ribs of each pair.
5. In combination, a sectional sheet metal bottom bearing shield having longitudinal, spaced ribs, tapered longitudinally and substantially pointed at the bottom portion of

the shield and a tapered nut adapted to engage said ribs and expand the shield and having a wedge shaped portion disposed between certain of said longitudinal ribs.

- 5 6. In combination, a sectional sheet metal bottom bearing shield, each section having longitudinal, spaced ribs, tapered longitudinally and substantially pointed at the bottom portion of the shield and a tapered nut
10 having portions extending between said ribs.
7. In combination, a sectional shield hav-

ing a pair of longitudinal ribs in each section inclined with respect to each other and each rib being tapered longitudinally toward the bottom end of the shield from the other end 15 and a tapered nut having tapered projections extending between the pairs of ribs.

In witness whereof, I have hereunto set my hand this 8th day of July, 1921.

JOHN EDWARD OGDEN.

Witness:

I. B. MOORE.