July 24, 1962 F. L. NETTLETON 3,045,565

EXPANSION JOINT KIT

Filed June 25, 1957

2 Sheets-Sheet 1

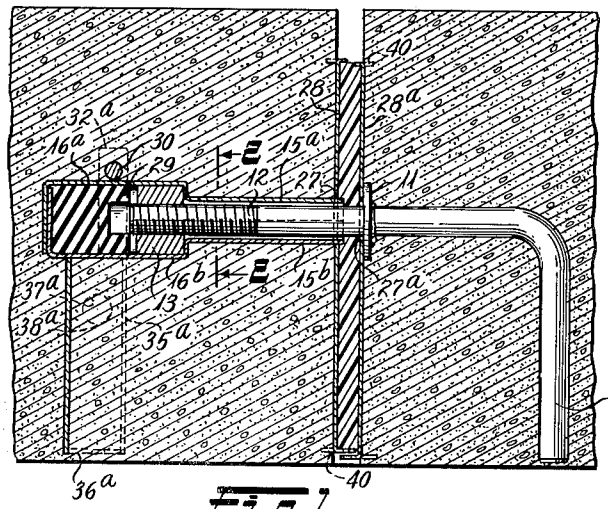


Fig. 1.

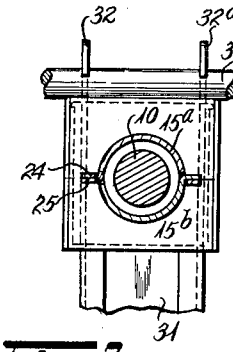


Fig. 2.

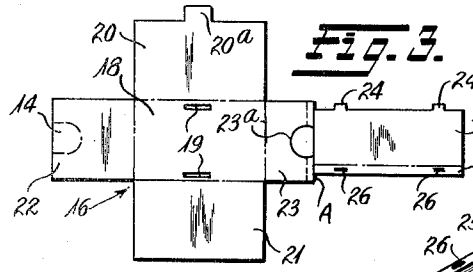


Fig. 3.

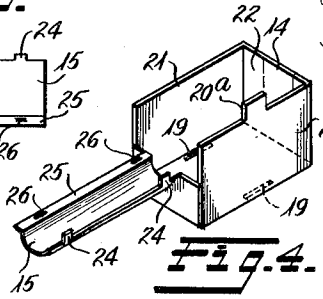


Fig. 4.

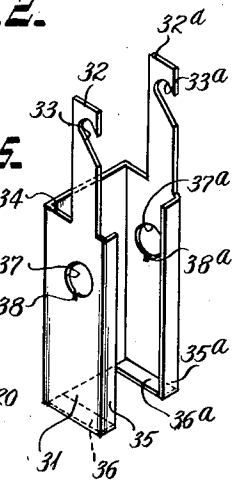


Fig. 5.

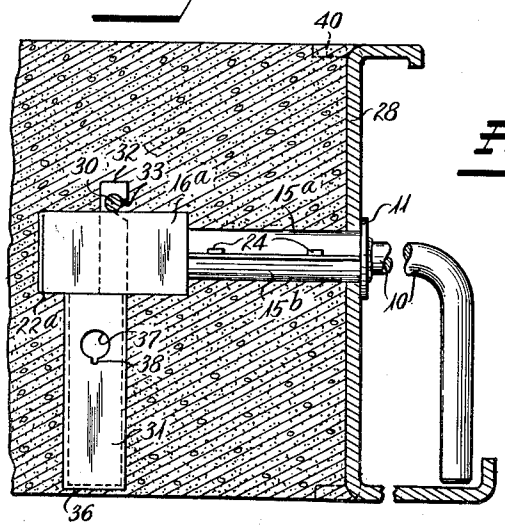


Fig. 6.

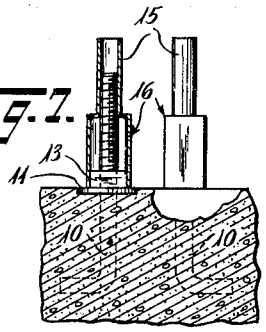


Fig. 7.

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EXPANSION JOINT KIT

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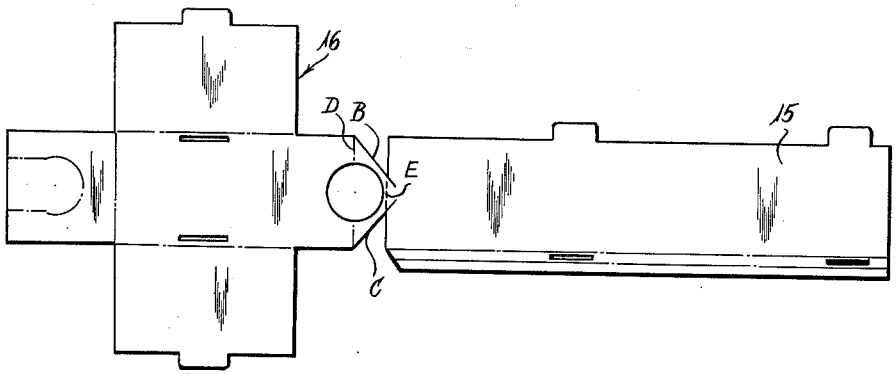


Fig. 8.

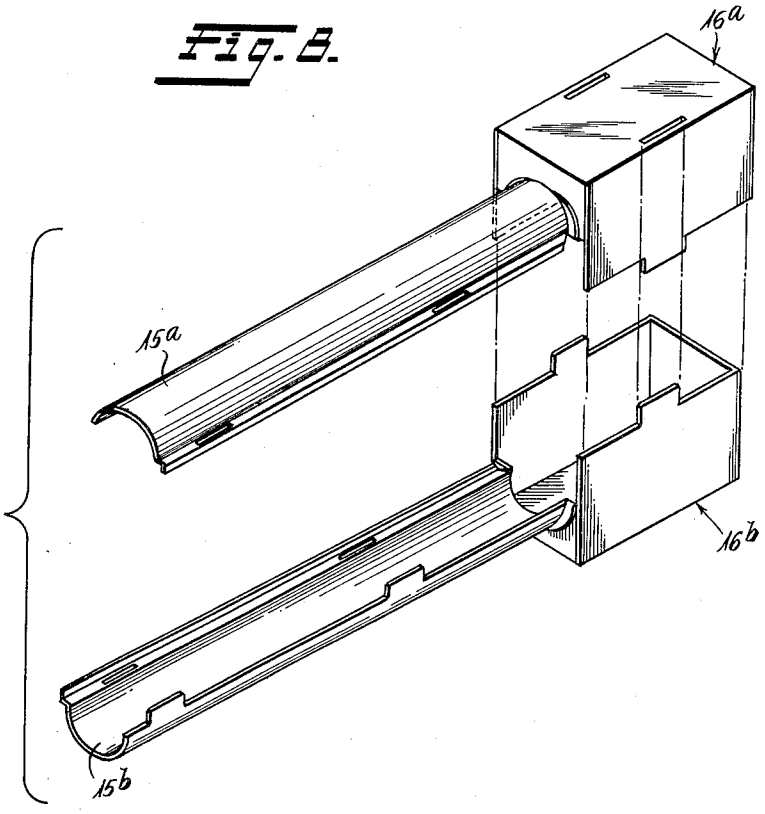


Fig. 9.

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3,045,565

EXPANSION JOINT KIT

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2 Claims. (Cl. 94—18)

My invention relates to means for forming metallic reinforcing joints in concrete. One of its principal advantages resides in the fact that the same basic dowel may be used to form any of a number of different joints which ordinarily require different structural elements.

The invention is, however, primarily used as an expansion joint to facilitate the movement of the finished concrete in expansion and contraction, while providing guidance, rigidity, and alignment control to make a strong permanent construction such as is required in all roads, buildings, runways, etc.

A preferred embodiment of my invention is illustrated in the accompanying drawings in which:

FIG. 1 is a vertical cross-section showing an expansion joint constructed according to my invention;

FIG. 2 is a transverse cross-section taken along the line 2—2 of FIG. 1;

FIG. 3 shows the blank from which one part of the cover is formed;

FIG. 4 is a perspective view showing one of the two halves of the cover or housing;

FIG. 5 is a perspective view showing the supporting chair;

FIG. 6 is a side view, with the concrete in section, showing the first half of a rigid joint;

FIG. 7 shows the cover member or housing used to protect the threads on the protruding portions of anchor members embedded in a concrete block;

FIG. 8 shows an alternative blank from which the cover members may be formed; and

FIG. 9 is an exploded perspective view showing two of the FIG. 8 blanks ready for assembly.

Like reference characters denote like parts throughout the several views.

Referring now to FIGURE 1, the principal dowel element **10** is L-shaped, and provided with a fixed flange **11** along its horizontal arm. The end **12** of this arm is threaded with a special strong coarse thread adapted to mesh with the internal threads on the square nut **13**. This threaded end **12** of the dowel **10** is encased in a cover which consists of a first portion **15** of circular cross-section and a second portion **16**, which has a square cross-section. Each portion of the cover is made of two identical parts, **16***a*, **16***b*, **15***a*, **15***b*.

FIGURE 3 shows a blank which may be cut along the line A. The left hand part may then be bent to form cover member **16***a* or **16***b*, and the right hand part to form **15***a* or **15***b*. The two parts may then be re-attached to each other by spot-welding or the like, if desired. It will be noted that each element **16***a* or **16***b* consists of a central portion **18** which serves as either the top or bottom of the first cover, and is provided with a transverse slot **19** near two edges thereof. This central portion **18** is surrounded by the tabs **20** and **21** which bend up or down to form the sides of the square cover **16** and **22** and **23** which are bent to form the ends thereof, the tip **20***a* of the side tab **20** passing through the slot **19** and then being bent back to hold the assembly together. A semi-circular portion of the tab **23** is cut out at **23***a* to register with the end of cover member **15**, which cosists of the two semi-cylindrical halves **15***a* and **15***b*, each of which carries along one longitudinal edge a plurality of tabs **24** and along the other longitudinal edge a slotted flange **25**. The tabs **24** of the part **15***a* are adapted to fit into the slots **26** in the flange **25** of the part **15***b*, and the tabs on the part **15***b* fit into the slots in **15***a* in a similar manner.

FIGURE 8 shows an alternative blank from which both cover members **15** and **16** may be made. As shown in this figure the portion of the blank which is to form the element **15** is notched at band C. This permits the longitudinal edges of this portion to be drawn upward to form a semi-cylindrical cover member butting against the end of the cover member **16** when the blank is bent along the lines D and E. This blank is not otherwise different from that shown in FIGURE **3**.

To assemble an expansion joint the dowel **10** is inserted in the registering holes **27**, **27***a* in a pair of elongated channel members **28**, **28***a*, adapted to receive between them a suitable resilient material. These elongated channel members are provided with tabs **40** which project into the concrete for anchorage and to act as stiffeners so that the channel members will move with the concrete. The dowel is pressed through until the flange **11** engages one of the channel members. The two parts of the cover member **15** are then fastened together and slipped over the horizontal arm of the dowel **10**. This cover projects through the hole **27** in the channel member **28**, which is made just large enough to accommodate the cylindrical cover but too small to pass the projecting tabs **24**, which serve as stops. The square nut **13** is then threaded onto the dowel **10** and the end of the dowel is covered by a resilient spacer **29**, which may be made of foam rubber, for example and provided with a recess **41** to receive the end of the dowel. When the concrete expands, the dowel end will first move into this recess, and then compress the resilient spacer. The two parts **16***a* and **16***b* of cover member **16** are then fitted together over the nut **13** and spacer **29**, the tip **20***a* of tab **20** of one half of the cover member **16** being slipped through the slot **19** of the other half, and may then be bent out to lock the cover together. Since the entire interior of the cover is filled by the dowel, nut and spacer, which will support it against the pressure of the concrete, the cover may be made of relatively thin and inexpensive material.

The chair **31** is then placed in position, with its tabs **32**, **32***a* extending upwardly through the slot **19** in the cover **16**. These tabs are notched at **33**, **33***a* near their upper ends to receive a temperature bar **30**. It will be noted that the chair is provided with a seat **34** for the bottom of the housing, transverse flanges **35**, **35***a* for strength, and base members **36**, **36***a* to maintain it in a strictly vertical position. The chair may be provided with registering holes **37**, **37***a* to receive an aligning bar of the type carrying a longitudinal rib which will fit into the notches **38**, **38***a*. The concrete may then be poured and the concrete is free to expand or contract independently of the dowel within the housing.

If one of the adjacent slaps is poured before the ground for the other is completely prepared, a single channel member may be used as shown in FIGURE 6, and the joint otherwise assembled in the same manner as in the case of FIGURE 1. After the concrete has been poured to the left of the channel member, as shown in FIG. 6, the dowel may be unscrewed, using its vertical arm as a crank, and withdrawn from the housing. The ground on the right of the figure may then be prepared without danger of damaging the dowel itself or tools which might come into contact with it. The dowel may then be screwed back into the nut and concrete poured to form a slab at the right of FIGURE 6. This may be either a plain construction joint, as shown in FIG. 6, or an expansion joint, in which case a second channel member and the necessary packing material should be positioned at the right of the single channel member shown in FIG. 6, in the manner shown in FIG. 1, before the dowel is reinserted in the housing.

If the joint is used in a wall, the chair and channel members are not ordinarily used, but a flat header may be

substituted for one channel member. The joint is then assembled in the manner already described, the dowel being inserted through a hole in the header. After the concrete on the housing side of the header has been poured and set, the dowel is withdrawn, the header stripped away, and the dowel reinserted, at which time it may be set either for a construction or an expansion joint.

If the dowel is to be used as an anchor member when pouring a pier or the like, as shown in FIG. 7, the knock-out portion **14** of the tab **22** (shown by the dotted lines in FIG. 3) should be removed. The housing is then closed about the nut **13**, which is screwed onto the threaded end of the dowel, and concrete is poured about its lower end. When the pouring has been completed, the housing may be employed as a socket wrench to remove the nut, and the housing and nut re-used to protect another dowel. Alternatively, the nut may be screwed back on and only the housing re-used.

It will be appreciated that the foregoing specific embodiment has been described purely by way of example, and may be modified as to specific details without thereby departing from the basic principles of my invention as defined in the following claims.

What I claim is:

1. In an expansion joint of the type comprising two parallel elongated members provided with at least one pair of registering apertures and located between two adjacent concrete slabs, said elongated members being separated by a packing of yielding material, a rigid dowel having a first arm embedded in one of said slabs and lying in a plane parallel to said elongated members and a second arm extending transversely through said pair of registering apertures in said elongated members and said yielding material and terminating in a threaded portion, a nut having a non-circular cross-section mounted on said threaded portion, and a housing embedded in the other slab and comprising a broad portion axially longer than said nut but fitting snugly about its perimeter so as to permit relative axial sliding but prevent relative rotation between said nut and housing, and a relatively narrow elongated cylindrical portion fitting snugly around said dowel and extending from said broad portion to the adjacent elongated member, said housing being longitudinally divided into at least two parts provided with mating tabs and slots.

2. A joint as claimed in claim 1 in which said elongated members are a pair of channel members adapted to retain said yielding material, and said cylindrical housing portion extends through one of the apertures constituting said pair of apertures, at least one of the tabs on said housing being positioned near one end of said cylindrical housing portion and extending outwardly therefrom so that said cylindrical housing portion cannot pass completely through said aperture, whereby said tab serves as a stop to position the housing with respect to the channel member.

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