Dec. 6, 1966 J. L. WATTS 3,289,379

HANGER INSERT FOR PRESTRESSED CONCRETE

Filed Oct. 9, 1963

Fig. 1.

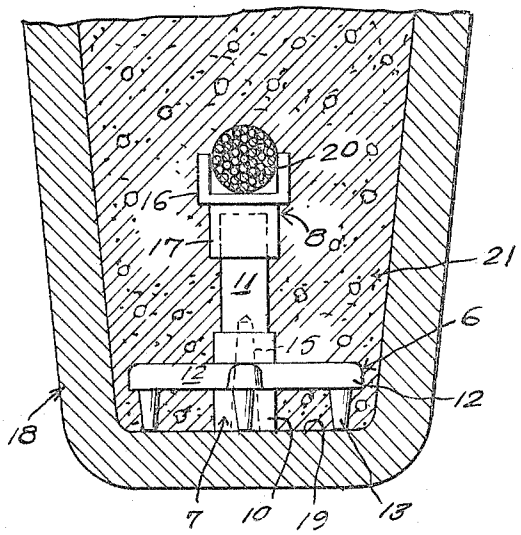


Fig. 2.

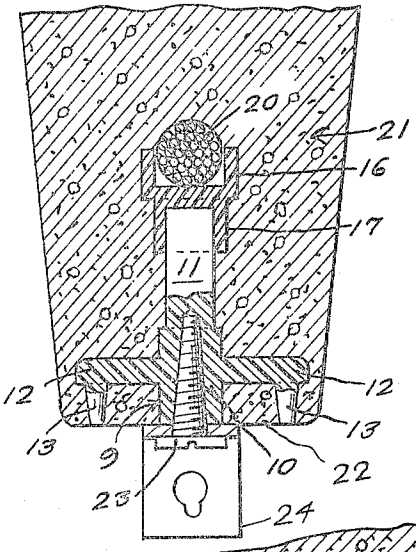
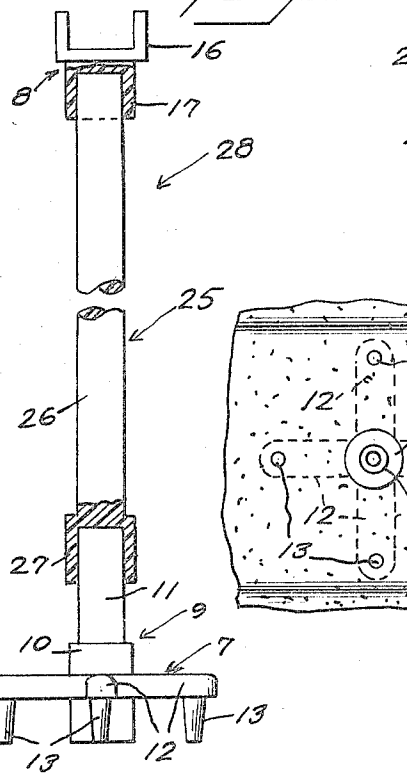


Fig. 5.



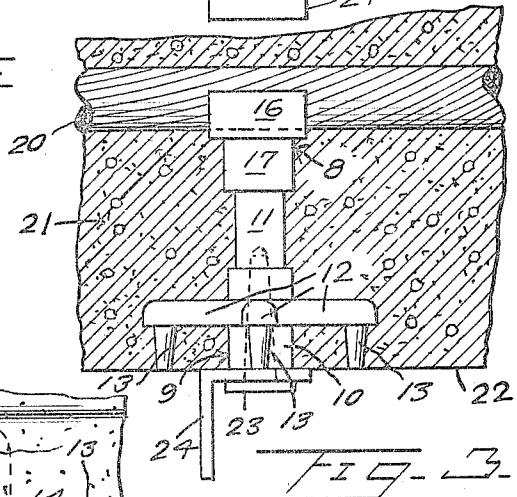


Fig. 3.

Fig. 4.

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HANGER INSERT FOR PRESTRESSED CONCRETE

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5 Claims. (Cl. 52—689)

This invention relates to a novel insert or anchor which is primarily adapted to be embedded in a prestressed concrete member, such as an overhead beam, and which is utilized for suspending a supporting bracket which may be employed for supporting various items such as electric conduits or electric fixtures.

More particularly, it is an object of the present invention to provide a concrete insert or embedded anchor which may be formed entirely of plastic and which will facilitate the attachment thereto of a fastening of the supporting bracket.

Still a further object of the invention is to provide an insert which may be readily located in a concrete beam or the like for the attachment of the supporting bracket thereto.

Still a further object of the invention is to provide an insert which may be adjusted as to length to accommodate it to prestressed concrete members the bottom wire ropes of which are spaced different distances from bottom surfaces of the concrete members.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating presently preferred embodiments thereof, and wherein:

FIGURE 1 is a side elevational view of the insert in an applied position relative to a portion of a concrete beam and a portion of a mold for said beam;

FIGURE 2 is a vertical sectional view, partly in elevation, of the insert and showing a part of the concrete beam in cross section in which said insert is embedded;

FIGURE 3 is an elevational view of the insert, looking from left to right of FIGURE 2;

FIGURE 4 is a bottom plan view of a part of the concrete beam in which the insert is embedded, and

FIGURE 5 is a fragmentary side elevational view, partly in vertical section, illustrating a modification of the insert.

Referring more specifically to the drawing, and first with reference to FIGURES 1 to 4, the insert in its entirety and comprising the invention is designated generally **6** and includes a lower section, designated generally **7**, and an upper section, designated generally **8**. The lower section **7** includes an upright stem **9** which is preferably of circular cross section and which includes a lower portion **10** and an upper portion **11**. The lower portion **10** is of a diameter somewhat greater than that of the upper portion **11**. The lower portion **10** is provided with a plurality, preferably four, arms **12** which extend radially therefrom and which are equally spaced relative to one another. The arms **12** are spaced from the ends of said lower portion **10** and are disposed coplanar with one another. A foot member **13** extends downwardly from each arm **12**, near its outer end. The lower ends of the corresponding foot members **13** are disposed coplanar with one another and with the flat lower end **14** of the lower stem portion **10**. The stem **9** is provided with a blind bore **15** which extends upwardly from said lower end **14** thereof and which is tapered toward its upper end. The tapered bore **15** preferably extends through the lower stem portion **10** and slightly into the upper stem portion **11**. All of the aforedescribed parts of the lower section **7** constitute a one-piece molded plastic unit.

The upper section or head **8** likewise constitutes a one-piece molded plastic unit and includes a U-shaped top portion or yoke **16** from the base of which depends a downwardly opening socket or cap **17**. The cap or socket **17** is of a correct internal size to snugly receive the upper portion of the upper stem part **11**.

Assuming that the sections **7** and **8** are assembled together, as illustrated in FIGURES 1 to 3, to form the insert or anchor **6**, said insert **6** is positioned in a bottom portion **18** of a conventional mold and with the foot members **13** and the base end **14** resting flush on the upper surface **19** of the mold bottom, and with the yoke **16** engaging under a portion of a lowermost tensioned wire rope **20**, so that said wire rope portion seats in the yoke **16** for wedging the insert **6** between said wire rope portion and the surface **19**. Concrete **21** is then poured into the mold portion **18** and is subjected to vibration during pouring, as is conventional. The inner surface of the steel mold portion **18** is highly polished and smoothed. Accordingly, it is essential that the insert **6** be wedged tightly between the wire rope **20** and the surface **19** in order to maintain the base end **14** and the terminals of the foot members **13** flush against said surface **19** during pouring, vibration and setting of the concrete **21**, so that thereafter when the form **18** is removed said terminals of the foot members and the stem base **14** will be exposed and flush with the bottom surface **22** of the prestressed concrete beam **21**.

The prestressed concrete beam usually includes several vertically spaced tensioned wire ropes, corresponding to the wire rope **20**. Since the insert **6** functions only in conjunction with the bottommost wire rope, the remaining wire ropes have not been illustrated. The upper section **8** is constructed separable from the lower section **7** because the bottom tensioned wire rope **20** may be spaced different distances from the surface **19**. Accordingly, the stem portion **11** may initially be made longer than as shown and cut off to a proper length, as illustrated in FIGURES 1 and 2, before application of the upper section or head **8**.

A tapered metal screw **23**, which extends upwardly through a conventional hanger bracket **24**, is screwed into the bore **15** and in being applied thereto will tap said bore. The bracket **24** may be utilized for supporting such items as electrical fixtures or electrical conduits. By utilizing a self-tapping screw **23** in the bore of the plastic stem **9**, if it is necessary to remove the fastening **23**, it can always be replaced with a slightly larger fastening for re-tapping the bore **15**.

The exposed base **14** with its bore **15**, surrounded by the exposed terminals of the foot members **13**, will enable the bore **15** to be readily located for application of the fastening **23** thereto. The arms **12** assist in effectively anchoring the insert **6** in the concrete **21**. The insert **6**, although being made of plastic, becomes practically indestructible due to being embedded in the concrete and as it is not exposed to sunlight it will not oxidize. The plastic is slow burning and an immense amount of heat is necessary to ignite it. The bracket **24** is capable of supporting a constant pull in excess of two hundred pounds without risk of the fastening **23** being pulled from the bore **15**.

In some instances, the lowermost wire rope **20** is spaced a considerable distance from the bottom surface **19** of the form **18**. FIGURE 5 illustrates a modification of the insert which includes, in addition to the lower section **7** and upper section **8**, an intermediate section, designated generally **25**, and which includes an elongated stem **26** of the same cross sectional size and shape as the upper stem portion **11** and which is provided at its lower end with a downwardly opening socket **27**, corresponding to the socket **17**. The socket **27** engages detachably over the upper end of the stem **11**, in the same manner as the socket **17**, and the upper end of the stem **26** fits into the socket **17**, in the same manner as the stem portion

11. Like the stem portion 11, the upper end of the stem 26 may be cut off to vary the over-all length of the insert 28, as illustrated in FIGURE 5, to accommodate said insert to wire ropes spaced different distances from the bottom surface 19 of the form.

Various other modifications and changes are contemplated and may be resorted to, without departing from the function or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. An insert for a concrete structural member adapted to be wedged between a part of a metal form and a lowermost tensioned wire rope disposed parallel to said form part comprising, a lower section and an upper section, said lower section comprising an upright stem having a substantially flat bottom surface adapted to rest flush on an upper surface of a part of a form, said stem having a longitudinal bore opening outwardly of said bottom surface, arms extending radially from said stem and disposed above and spaced from said bottom surface and in spaced apart relation to one another, solid foot members depending from outer portions of said arms and having lower ends disposed coplanar with one another and with said bottom surface and adapted to rest on said upper surface of the form part; said upper section comprising a downwardly opening socket having a smooth bore engaging detachably over a smooth exterior of the upper end of said stem and an upwardly opening yoke, consisting of a base portion and upstanding spaced apart terminal elements, in which a tensioned wire rope is adapted to seat for wedging the insert between the wire rope and said upper surface of the form part to be embedded in concrete applied to said form such that said bottom surface of the stem and the lower ends of said foot members will be exposed when the form is removed from the set concrete, said bore being adapted to receive and secure a hanger bracket fastening to the insert for suspending a hanger bracket therebeneath and beneath the concrete structural member.

2. An insert as in claim 1, said lower section and said upper section each constituting a one-piece plastic unit.

3. An insert as in claim 1, said upper section and said lower section each constituting a one-piece plastic unit, said stem including a lower portion and an upper portion, said arms being disposed intermediate of the ends of the lower portion, said upper portion being of smaller cross sectional size than the lower portion of uniform cross sectional size throughout its length and being adapted to be cut off for varying the overall length of the stem and the overall height of the assembled insert.

4. An insert for a concrete structural member adapted to be wedged between a part of a metal form and a lowermost tensioned wire rope disposed parallel to said form part comprising, a lower section and an upper section, said lower section comprising an upright stem having a substantially flat bottom surface adapted to rest flush on an upper surface of a part of a form, said stem having a longitudinal bore opening outwardly of said bottom surface, arms extending radially from said stem and disposed above and spaced from said bottom surface and in spaced apart relation to one another, foot members depending from outer portions of said arms and having lower ends disposed coplanar with one another and with said bottom surface and adapted to rest on said upper surface of the form part; said upper section comprising a downwardly opening socket engaging detachably over the upper end of said stem and an upwardly opening yoke in which a tensioned wire rope is adapted to seat for wedging the insert between the wire rope and said upper surface of the form part to be embedded in concrete applied to said form such that said bottom surface of the stem and the lower ends of said foot members will be exposed when the form is removed from the set concrete, said bore being adapted to receive and secure a hanger bracket fastening to the insert for suspending a hanger bracket therebeneath and beneath the concrete structural member, said stem including a detachable upper portion defining an intermediate section of the insert having an upper end engaging detachably in said downwardly opening socket of the upper section and a lower end provided with a downwardly opening socket receiving a portion of the stem of said lower section.

5. An insert as in claim 4, said lower section, upper section and intermediate section each constituting a one-piece plastic unit.

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