H. J. SMITH.

CONCRETE ANCHOR.

APPLICATION FILED DEC. 11, 1911.

1,089,874. Patented Mar. 10, 1914.

Fig. 1.

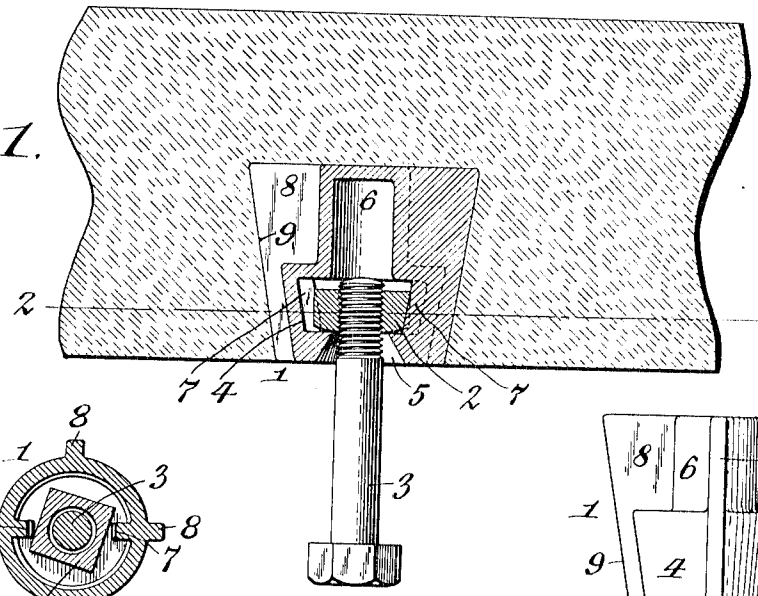



Fig. 2.







Fig. 3.

Fig. 4.

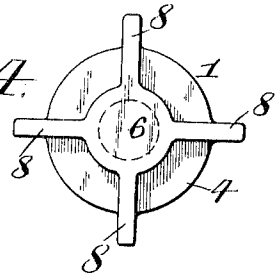



Fig. 5.

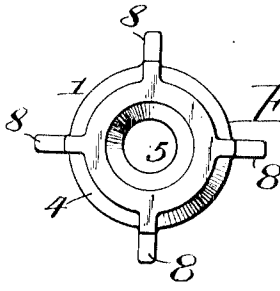
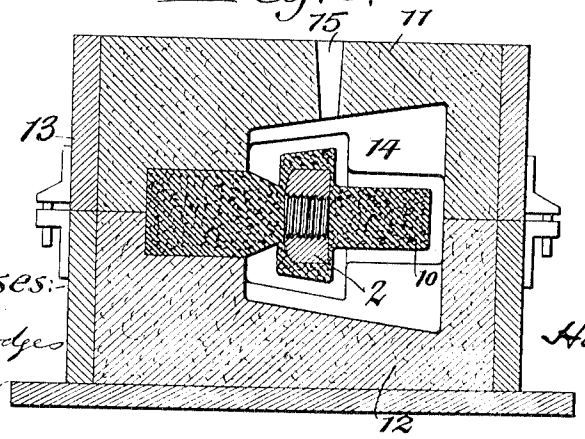



Fig. 6.




Witnesses:-

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# UNITED STATES PATENT OFFICE.

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## CONCRETE ANCHOR.

1,089,874. Specification of Letters Patent. Patented Mar. 10, 1914.

Application filed December 11, 1911. Serial No. 665,076.

*To all whom it may concern:*

Be it known that I, HARRY J. SMITH, a citizen of the United States, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Concrete Anchors, of which the following is a specification.

This invention relates to an anchor which is more particularly designed for fastening to concrete floors, walls or ceilings such articles as hangers, beams and machinery.

It is the object of this invention to produce anchors of this character economically and of such construction as to permit of securely and conveniently fastening parts to concrete structures.

In the accompanying drawings: Figure 1 is a vertical section showing my improved anchor applied to the concrete ceiling of a building. Fig. 2 is a horizontal section in line 2—2, Fig. 1, with the concrete ceiling omitted. Fig. 3 is a side elevation of the body of the anchor. Figs. 4 and 5 are top and bottom plan views of the body of the anchor. Fig. 6 is a sectional elevation of a molding flask illustrating the method of producing the body of the anchor and inclosing a screw nut therein.

Similar characters of reference indicate corresponding parts throughout the several views.

The anchor embodying my invention comprises generally a body 1 adapted to be embedded in the concrete wall, floor or ceiling of the building so that the front, lower or outer end of the anchor is exposed or flush with the surface of the concrete, a screw nut 2 arranged within the body, and a bolt 3 engaging its threaded shank with the threaded opening of the nut.

The body of the anchor is cast of metal and comprises a lower enlarged chamber 4 provided on its underside or bottom with an inlet opening 5, a contracted upper chamber 6 opening at its lower end into the lower chamber and arranged in line with the opening 5, internal stops or shoulders 7 arranged on the side wall of the lower chamber on opposite sides of the opening 5, and a plurality of longitudinal ribs or wings 8 arranged equidistant around the outer side of the upper and lower chambers and having their outer edges 9 inclined or beveled so that together they form a cone frustum. The lower enlarged chamber of the body also has the form of a downwardly tapering cone frustum but the upper contracted chamber is preferably of cylindrical form, as shown in the drawings.

The angle of the conical side wall of the lower chamber is the same as the angle of the beveled outer edges of the wings. This body is embedded in the concrete while the latter is in a plastic condition with the outer end of the body exposed or flush with the surface of the concrete and after the latter has set or become dry and hard the body is securely held in the concrete against turning or being pulled out, the turning being prevented by the wings and the adhesion or friction of the concrete and the pulling out being resisted by the adhesion or friction of the concrete and the conical form of the lower chamber and the beveled edges of the wings. The body is thus firmly and securely anchored in the concrete and capable of safely supporting the heaviest loads likely to be attached to the body without liability of the body being detached from the concrete.

The screw nut is arranged within the enlarged chamber of the body with its opening in line with the inlet opening of this chamber and also in line with the contracted chamber. This nut fits loosely in the enlarged lower chamber but its diameter is greater than the upper chamber and said inlet opening so that the nut is confined in the lower chamber.

For the purpose of preventing the screw nut from making more than a partial rotation about the axis its diameter is greater than the distance between the stop shoulders 7 within the lower chamber.

The hanger beam or other part to be mounted on the concrete ceiling is first attached to the bolt 3 and then the latter is passed through the inlet opening of the body and screwed into the threaded opening of the nut 2 until the part to be supported on the concrete body is in the desired position. After the attaching screw has passed through the screw nut the same enters the contracted upper chamber of the anchor body which provides the necessary clearance space to permit the screw to pass into the anchor body as much as necessary. Upon turning the attaching bolt the screw nut is prevented from turning more than a small extent by reason of the corners of the screw

nut engaging with the stop shoulders 7 within the body, thereby enabling the screw to pass through the nut and be tightened.

In order to permit the attaching bolt and the nut to tilt to a limited extent and aline themselves to the direction of the pull of the bolt when attaching a part to the concrete body the opening 5 in the body of the anchor is made somewhat larger in diameter than this bolt and is also flared outwardly or downwardly, as shown in Figs. 1 and 5, and the chamfered, beveled or rounded side of the nut is engaged with the bottom of the lower chamber, so as to form a ball and socket joint between the body and the bolt which insures a large bearing surface between the nut and anchor body and forms a reliable support for the load. By thus chamfering the nut and flaring the inlet opening the bolt can also follow the nut through a considerable circular angle, thereby allowing for bad setting of the anchor body in the concrete, also any imperfections in the bolt hole of a wooden beam, iron foot of a hanger or other piece to be clamped to the concrete which does not exactly register with the anchor body and still permit the bolt to be inclined and find the nut for screwing these parts together.

It will be noted that by closing the chambers of the anchor body at the top and sides and providing an opening for the bolt only at the under or outer side thereof, the concrete and water is excluded from the interior of these chambers and prevented from reaching the threads of the nut and bolt and interfering with assembling of the parts.

Various means may be employed for producing the anchor body with the screw nut trapped or confined therein against displacement.

The method of casting the anchor body around the screw nut and the mold for accomplishing this result are preferably as follows:—10 represents a core in which the nut 2 is embedded so as to be completely surrounded by the core. 11, 12 represent the cope and drag of the molding sand of a flask 13. The core 10 is arranged between the cope and drag and the opposing sides thereof are constructed to form with said core the mold cavity 14 in which the body of the anchor is cast by pouring the metal into the same through the sprue 15. After this casting is completed the same is removed from the mold and the core removed from the casting leaving the screw nut confined loosely within the lower enlarged chamber of the anchor body and in position to receive the fastening bolt. The nut is thus permanently associated with the anchor body and the latter is closed on all sides except at the front end thereof so that concrete and water can not interfere with the use of the anchor.

The anchor is not only very strong and durable in construction, but the same can also be produced at comparatively low cost and also permits of installing machinery on concrete bodies conveniently and expeditiously.

I claim as my invention:

1. A concrete anchor comprising a hollow cast body having a lower chamber, an upper chamber opening into the lower chamber and an opening arranged in the underside of the body and in line with the upper chamber, and a screw nut arranged in said lower chamber and constructed of such size as to prevent its removal from the lower chamber.

2. A concrete anchor comprising a hollow cast body having a lower chamber, an upper chamber opening into the lower chamber and an opening arranged in the underside of the body and in line with the upper chamber, and a screw nut arranged in said lower chamber and constructed of a size to prevent its removal from the lower chamber and said lower chamber being provided with an internal stop shoulder which is engaged by the corners of said screw nut for preventing the latter from turning within the body.

Witness my hand this 7th day of December, 1911.

HARRY J. SMITH.

Witnesses:
B. H. CAMPBELL,
P. A. STRATTON.