May 25, 1926. 1,586,085

H. O. HILL

FOOTING FOR STRUCTURAL ELEMENTS

Filed May 5, 1924

Fig. 1

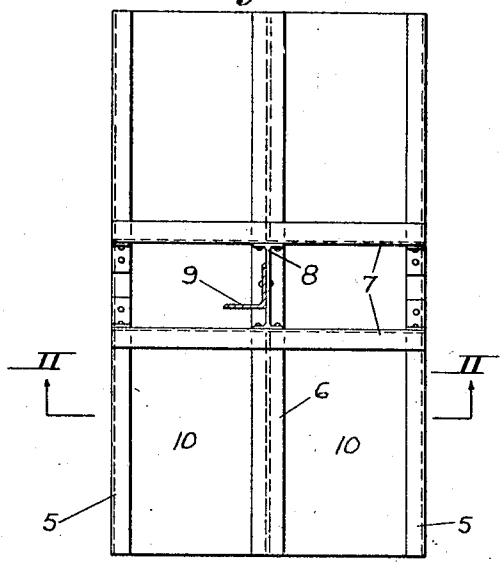



Fig. 4

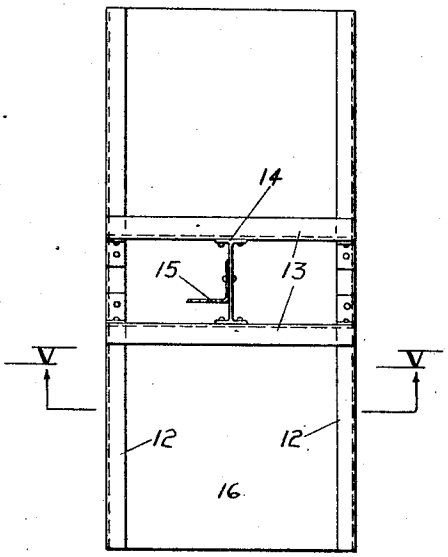



Fig. 3

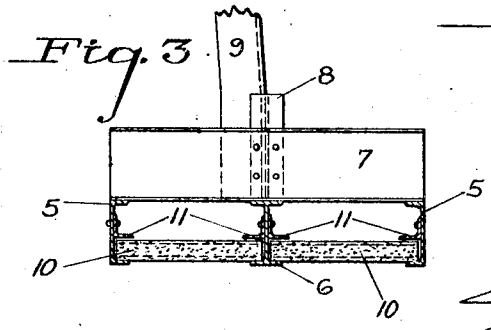



Fig. 5

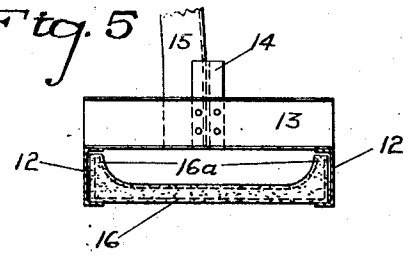



Fig. 2

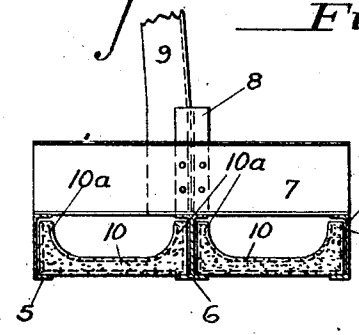



Fig. 7

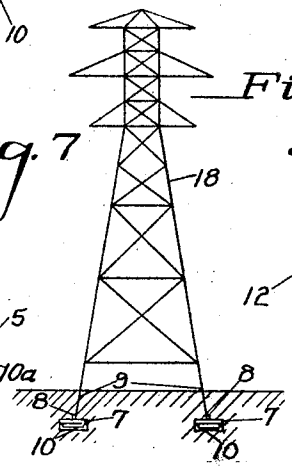
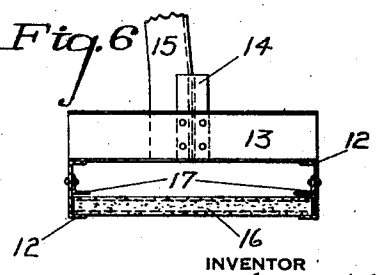



Fig. 6




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# UNITED STATES PATENT OFFICE.

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## FOOTING FOR STRUCTURAL ELEMENTS.

Application filed May 5, 1924. Serial No. 711,185.

This invention is for a footing or ground anchor for structural elements, such for instance as structural metal transmission towers.

In the erection of power transmission lines, it is necessary that the transmission towers be well anchored and have a good footing in the ground in which they are erected. One common form of ground anchor for such towers comprises a grille made of several spaced apart beams having wide bottom flanges. In soft earth, such a footing may cut through the earth, the spaces between the beams permitting of this. Consequently, the footing may rise or lower from the position in which it is set. Another serious disadvantage of this kind of a footing is the excessive amount of steel that has to be used, and which serves no other purpose in the footing than to provide a wide surface to resist movement in the earth. This steel not only increases the initial cost of the tower, but also is a big item in transportation costs.

Concrete footings for the tower are frequently used, but, due to the distance covered, and the condition and character of the country traversed, it is very expensive to haul the materials used in making the concrete, it generally being necessary to even haul the water, as well as the implements or machinery, and labor for mixing the concrete. Consequently, there is a trend in favor of the structural steel anchor.

The present invention purposes to provide a structural metal anchor in which is received suitable slabs, such as ready formed reinforced concrete blocks, this anchor having far less metal therein than the usual metal grille anchor, and providing a solid supporting and resisting surface that prevents the anchor from cutting through the ground.

This arrangement permitting, as it does, of far less steel being used, greatly decreases transportation costs. The reinforced concrete slabs can be readily formed at a conveniently located point and carried into the field with the other parts of the tower. Its great advantage, however, other than the saving of metal and transportation costs, is in the improved anchorage which it provides.

The invention may be readily understood by reference to the accompanying drawings, in which:—

Fig. 1 is a plan view of a footing embodying my invention;

Fig. 2 is a transverse section in the plane of line II—II of Fig. 1;

Fig. 3 is a similar section of a slightly modified construction;

Fig. 4 is a plan view of another modification;

Fig. 5 is a section on line V—V of Fig. 4;

Fig. 6 is a similar section of a modification;

Fig. 7 is a diagrammatic view indicating a type of tower with which the invention may be used.

In the form of invention shown in Figs. 1 and 2, the footing comprises two parallel channel irons 5 having their channels turned toward each other, and midway between the two is a length of I-beam 6. These three structural members are connected by transverse structural bars 7, between which is secured a short vertical I-beam or other suitable upright 8, to which a stud or tower leg or other structural element 9 is secured.

The channels on each face of the I-beam and on the inner faces of the channel bars provide a guideway into which a slab or block 10, preferably formed of reinforced concrete, may be slid and retained in place. In order that the block need not be needlessly heavy, the body of the block is relatively thin, but it has flanges $10^a$ of sufficient height to fit snugly in the channels.

In the modification shown in Fig. 3, the parts are generally similar, and corresponding reference numerals have been used. In order that the slab 10 may be perfectly flat, however, angle bars 11 are secured to the side faces of the I-beam 6 and the inside of the channels 5, thereby providing narrow guideways or flanges to receive or confine the edges of the slab 10, which slab is of substantially uniform thickness.

In the form of invention shown in Figs. 4 and 5, the same principle is followed, but there are merely two parallel channel bars 12 in the footing turned toward each other, the central I-beam of the Fig. 1 construction being omitted. The transverse connecting beams are indicated at 13, and 14 is the upright to which the leg or stud 15 is secured. The slab is designated 16 and, in

Fig. 5, is shown as having side flanges 16ª to make the edges of the block sufficiently thick to be retained in the channels.

In Fig. 6, the slab 16 is of substantially uniform thickness, but longitudinally extending angle bars 17 are secured to the inner faces of the channels to provide guideways to receive the edges of the slab.

In Fig. 7, I have shown diagrammatically, for the purpose of illustration, a transmission tower 18 having footings embodying the construction outlined, and showing the adaptability of the invention to transmission towers. However, I do not confine myself to the use of the invention for transmission towers alone, as it is equally applicable to other structures. Further, various changes and modifications may be made within the contemplation of my invention.

From the foregoing, it will readily be seen that, when the slabs are in the anchor construction and the entire assembly is in the ground, a reinforced concrete footing is provided having a large solid area over which the downward and upward strains are distributed.

Due to the fact that the slabs may cover a fairly wide span, the supporting beams may be spaced relatively far apart and a great saving of metal is thereby effected over similar anchors formed of a large number of spaced-apart I-beams with wide bottom flanges. Such a construction, furthermore, improves the footing because of the fact that the spaces between the beams being filled in, it is not possible for the anchor to cut through the earth.

I claim as my invention:—

1. A footing for structural elements comprising a pair of connected members having guideways therein, and a concrete slab adapted to be slid into position between said members and having its edges received in the guideways.

2. A footing for structural elements comprising a pair of flanged structural beams, the flanges of which extend toward each other, a slab having a relatively large area to receive the downward and upward strains of the structural elements and interposed between the beams and retained in position by the flanges thereon, and means connecting the structural beams.

3. A footing for structural elements comprising a plurality of spaced apart structural beams having oppositely disposed flanges thereon, means connecting the structural beams together, and concrete slabs having upper and lower contacting surfaces of relatively large area for contact with the earth interposed between the spaced apart elements, said slabs cooperating with and being retained in position by the flanges on said beams.

4. A footing for structural elements comprising a pair of parallel spaced apart structural beams each having spaced apart flanges thereon turned toward the flanges of the other, a guideway being formed between the flanges on each beam, a reinforced concrete slab having large contacting surfaces for contact with the earth for resisting movement in the earth interposed between the beams having its edges received in the guideways, and means connecting the beams.

5. A footing for structural elements comprising a pair of parallel spaced apart structural beams each having spaced apart flanges thereon turned toward the flanges of the other, a guideway being formed between the flanges on each beam, a reinforced concrete slab having large earth contacting surfaces interposed between the beams having its edges received in the guideways, cross bars connecting the parallel beams, and an upright connected with the cross-bars.

In testimony whereof I affix my signature.

HAROLD O. HILL.