

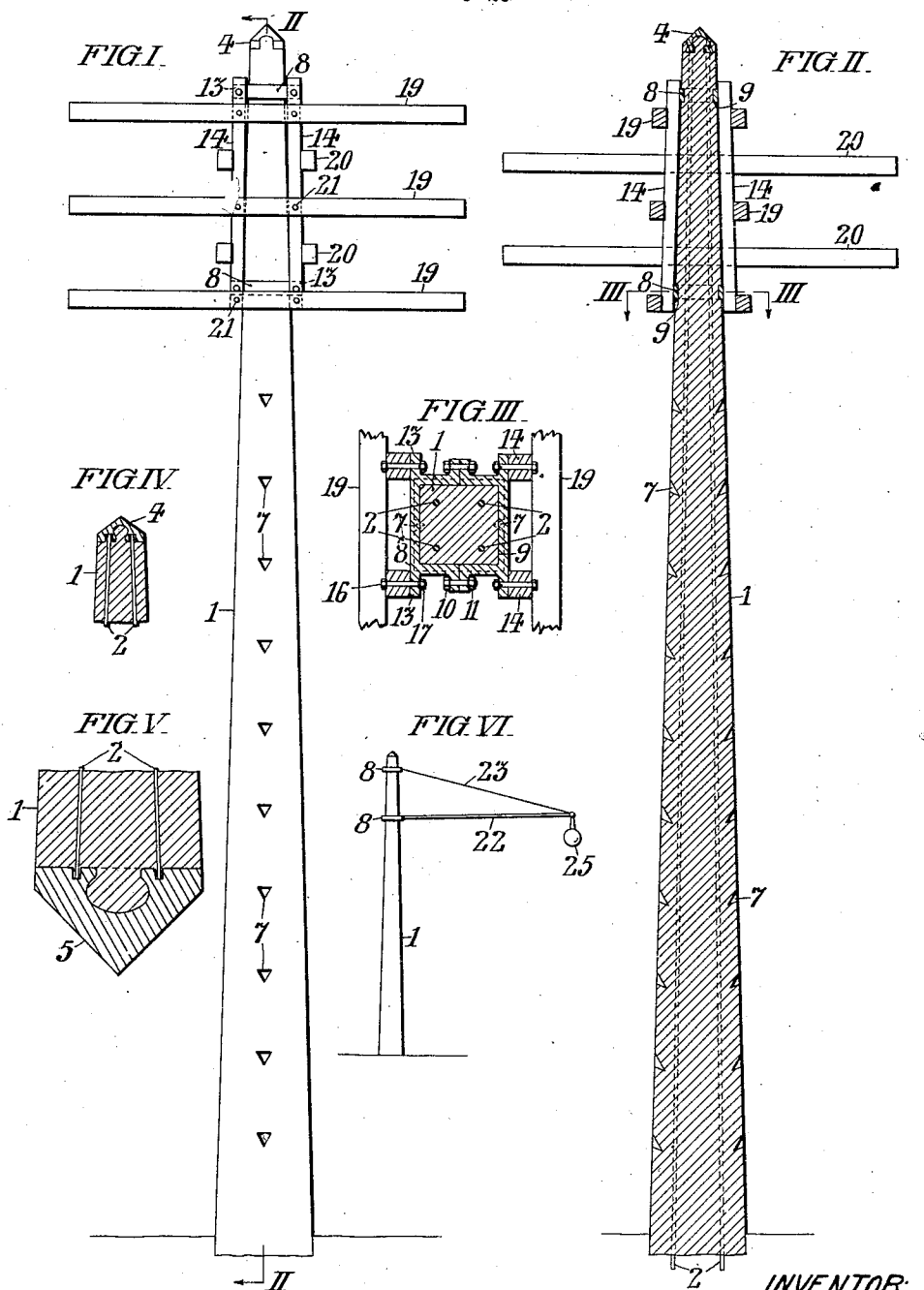
Dec. 13, 1927.

R. S. ELLIS

1,652,431

CONCRETE COLUMN

Filed May 23, 1925



INVENTOR:

RUSSELL SCOTT ELLIS,

by *Arthur E. Paige*
Attorney.

UNITED STATES PATENT OFFICE.

RUSSELL SCOTT ELLIS, OF PHILADELPHIA, PENNSYLVANIA.

CONCRETE COLUMN.

Application filed May 23, 1925. Serial No. 32,324.

My invention relates to reinforced concrete structures especially adapted for supporting electrical conducting wires, lamps, etc. Considerable difficulty has been experienced in attempting to form reinforced concrete columns for such purposes. Ordinarily, columns for such purposes have metallic members which are partially imbedded therein and project therefrom as means for attachment of the wires or other articles which the column is designed to support. However, upon exposure to the weather, such prior art structures tend to split, disintegrate and collapse as the result of progressive corrosion of the imbedded metallic reinforcements. Upon exposure to the weather, the projecting portions of the metallic members aforesaid corrode, the corrosion extends into the concrete mass with such enlargement of the metallic members by oxidation thereof as to split and otherwise disrupt the concrete. Moreover, I find that ordinarily concrete is so porous and permeable by moisture that unless approximately two inches thickness of concrete is provided exterior to such metal reinforcements, the latter become corroded by moisture which percolates through the concrete so that the latter is disrupted by the expansion of the oxidizing metal therein.

Therefore, the purpose and effect of my invention is to provide a reinforced concrete column free from the defects aforesaid in that the metal reinforcements are so located as to remain practically free from corrosion, and to provide means for preventing splitting of the columns, and to afford means for detachably securing wires or other structures which the column is designed to support, without permitting any metal member to project through the outer surface of the concrete.

As hereinafter described, my invention includes a monolith having an unbroken exterior concrete surface and having metallic reinforcements extending longitudinally therein, spaced so far from the exterior surface as to be immune from corrosion; said concrete structure being encircled by exterior bands of metal having the double function of preventing it from splitting and of forming means for attachment of the metal superstructures which support the electric conductors or other apparatus aforesaid.

My invention includes the various novel

features of construction and arrangement hereinafter more definitely specified. However, my copending application (77-27) Serial No. 194,307, filed May 26, 1927 for Letters Patent of the United States, includes claims covering columns such as disclosed herein.

In said drawings; Fig. I is an elevation of a concrete column designed and adapted for use as a support for telegraph, telephone or other electric conducting wires.

Fig. II is a vertical sectional view of said structure taken on the line II, II in Fig. I.

Fig. III is a fragmentary transverse sectional view of said structure taken on the line III, III in Fig. II, but on a larger scale.

Fig. IV is a fragmentary vertical sectional view of the precast cap and subadjacent portion of the monolith integrated therewith; on the same scale as Fig. II.

Fig. V is a fragmentary vertical section of the precast base and superimposed portion of the monolith integrated therewith; on the same scale as Figs. III and IV.

Fig. VI is an elevation, on a smaller scale, showing the column structure of Figs. I and II, with appurtenances used as a support for an electric lamp, in lieu of the superstructure shown in Figs. I and II for supporting electrical conductors.

In said figures; 1 is a concrete monolith having a continuous exterior surface unbroken by any metal projecting there-through; but containing a congeries of longitudinally extending metallic reinforcements 2 which are imbedded therein in such spaced relation to the outer surface thereof as to be immune from percolation of moisture under ordinary conditions of exposure to the weather. As best shown in Fig. III; said monolith 1 is of rectangular cross section and said reinforcements 2 are disposed therein in symmetrical relation with the axis thereof. Such relation of the reinforcing members is primarily established by properly grouping them in connection with the precast cap member 4 and base member 5 with recessed seats in which the concrete aggregate of the monolith 1 is integrally interlocked in any suitable manner; for instance, as in Figs. IV and V and by the method and means claimed in my copending application Serial No. 11,419 for Letters Patent of the United States, No. 1,563,615 granted December 1, 1925.

As shown; each of said column end members 4 and 5 has its outer face pointed in quadrangular pyramid form and its inner face plane with an axial recess, of circular and curved configuration, extending into it from its plane face, in coaxial relation therewith and surrounded by an annular series of recessed reinforcement seats, and each of the metallic reinforcement rods 2 extends from one of the recess seats in said cap 4 to one of the seats in said base 5; so that when said monolith column body 1 is cast, it extends into and interlocks with the axial undercut recesses in said end members and imbeds said reinforcement rods 2 so that they are spaced inwardly from the outer face of said column to such extent as to be protected from corrosion from exterior moisture. As shown; I prefer to make said base 5 of cross sectional area larger than said cap 4 and to taper said column body 1 from said base to said cap.

To facilitate the climbing of the prior art structures aforesaid, they are ordinarily provided with metal studs which project therefrom and are imbedded therein, spaced in a vertical series, and such elements tend to split the concrete as aforesaid. Therefore, I prefer to provide said monolith 1 with vertical series of pockets 7, so spaced upon diametrically opposite sides thereof that they may be readily engaged by climbing spurs clamped upon the feet of a lineman. As indicated in Fig. II, I prefer to make the lower walls of said pockets undercut for greater security of engagement by said spurs. As shown in Fig. I, each of said pockets 7 is preferably made of triangular configuration, the transversely opposite sides thereof being downwardly converged and, as shown in Fig. II, each of said pockets has its inner end nearer to the base of the column than its outer end; so that said footholds 7 are thus adapted to readily receive and securely interengage with an ordinary lineman's climbing spur. However, they may be otherwise formed and arranged.

To afford means for engaging any suitable superstructure which said column is designed to support or by which it is adapted to support something else; I provide said monolith 1 with a plurality of encircling bands 8 which, as best shown in Fig. II, are mounted in annular recesses 9 of the exterior of the concrete 1. Said bands 8 may be of any convenient form and unitary. However, I prefer to make them of the form shown in Fig. III wherein the band 8 is formed of two oppositely counterpart sections connected by bolts 10 and nuts 11. Such separable construction and arrangement is preferable, so that the bands may be readily replaced if they are broken. As shown in Fig. III; each section of said

band 8 is provided with laterally extending lugs 13 to which coupling beams 14, which connect said bands 8, are rigidly connected by bolts 16 and nuts 17. As shown in Figs. I and II, said coupling beams 14 serve to support the cross beams 19 and 20 which are conveniently attached thereto by lag screws 21 or bolts, and extend in transverse relation to each other and the axis of the column, and are adapted to support lines of electrical conductors extending in such transverse relation upon suitable individual supports attached to said cross beams.

The construction and arrangement above described are designed and adapted for supporting electrical conductors of any kind. However, columns constructed and arranged as above described may, of course, be used for other purposes and, in Fig. VI, I have shown such a column 1 stripped of the timber superstructure comprising the beams 14, 19 and 20, and carrying, in lieu thereof, the horizontally extending strut arm 22 connected to the lower band 8 and having the tension rod 23 extending from the upper band 8 to the outer end of said strut 22 where the electric lamp 25 is suspended.

Therefore, I do not desire to limit myself to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention, as defined in the appended claims.

I claim:

1. In a concrete column, the combination with a precast concrete and primarily separate cap member having a quadrangular pyramid top and a square base with a plane face and an axial undercut recess extending into said cap from said base, and a series of recessed reinforcement seats extending into said cap from said base in an annular series in coaxial relation therewith; of a precast concrete and primarily separate base member having a quadrangular pyramid bottom and a square top with a plane face and an axial undercut recess extending into said base member from said face, and a series of recessed reinforcement seats extending into said base member from said face in an annular series in coaxial relation therewith; a series of metallic reinforcement rods each extending from one of the seats in said cap to one of the seats in said base; whereby said reinforcements are spaced inwardly from the outer surface of said column to such extent as to be protected from corrosion from exterior moisture; and a monolith body of concrete cast in integral connection with said cap and base members, extending into and interlocking with the undercut recesses thereof and imbedding said reinforcement rods; said cap being of smaller cross

sectional area than said base, and said body being of quadrangular cross section, tapered from said base to said cap.

2. In a concrete column, the combination
5 with a precast concrete and primarily separate cap member having a pointed top and a plane bottom face and an axial undercut recess extending into said cap from said face, and a series of recessed reinforcement seats
10 extending into said cap from said face in an annular series in coaxial relation therewith; of a precast concrete and primarily separate base member having a pointed bottom and a plane top face and an axial undercut
15 recess extending into said base member from said face, and a series of recessed reinforcement seats extending into said base member from said face in an annular series in coaxial relation therewith; a series of metallic
20 reinforcement rods each extending from one of the seats in said cap to one of the seats in said base; whereby said reinforcements are spaced inwardly from the outer surface of said column to such extent as to be protected from corrosion from exterior moisture; and a monolith body of concrete cast in integral connection with said cap and base members, extending into and interlocking with the undercut recesses thereof and imbedding said reinforcement rods; said cap being of smaller cross sectional area than said base, and said body being tapered from said base to said cap.

3. In a concrete column, the combination
35 with a precast and primarily separate cap member having a quadrangular pyramid top and a square base with a plane face and an axial undercut recess extending into said cap from said base, and a series of recessed reinforcement seats extending into said cap from said base in an annular series in coaxial relation therewith; of a precast and primarily separate base member having a quadrangular pyramid bottom and a square
40 top with a plane face and an axial undercut recess extending into said base member from said face, and a series of recessed reinforcement seats extending into said base member from said face in an annular series in coaxial relation therewith; a series of metallic reinforcement rods each extending from one of the seats in said cap to one of the seats in said base; whereby said reinforcements are spaced inwardly from the outer surface of said column to such extent as to be protected from corrosion from exterior moisture; and a monolith body of concrete cast in integral connection with

said cap and base members, extending into and interlocking with the undercut recesses thereof and imbedding said reinforcement rods. 60

4. In a concrete column, the combination with a precast concrete and primarily separate cap member having an axial undercut recess extending into said cap from its bottom, and recessed reinforcement seats extending into said cap from its bottom in an annular series in coaxial direction therewith; of a precast concrete and primarily
70 separate base member having an axial undercut recess extending into said base member from its top, and recessed reinforcement seats extending into said base member from its top in an annular series in coaxial relation therewith; a series of metallic reinforcement rods each extending from one of the seats in said cap to one of the seats in said base; whereby said reinforcements are symmetrically spaced inwardly from the outer
80 surface of said column; and a monolith body of concrete cast in integral connection with said cap and base members, extending into and interlocking with the undercut recesses thereof and imbedding said reinforcement rods. 85

5. A precast concrete end member for a concrete column, having a quadrangular pyramidal outer face and a plane inner face, an axial undercut recess of symmetrical curved configuration extending into said member from said plane face, in coaxial relation therewith, and an annular series of recessed reinforcement seats extending into said member from said plane face, in coaxial relation therewith. 90

6. A precast end member for a concrete column, having a pointed outer face and a plane inner face, an axial undercut recess of symmetrical curved configuration extending into said member from said plane face, in coaxial relation therewith, and an annular series of recessed reinforcement seats extending into said member from said plane face, in coaxial relation therewith. 100

7. A precast end member for a concrete column, having a pointed outer face and an axial undercut recess extending into said member from its inner face, and an annular series of recessed reinforcement seats extending into said member from said plane face, in coaxial relation therewith. 105

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this eighteenth day of May, 1925.

RUSSELL SCOTT ELLIS.

CERTIFICATE OF CORRECTION.

Patent No. 1,652,431.

Granted December 13, 1927, to

RUSSELL SCOTT ELLIS. .

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 102, for the word "percast" read "precast"; same page, line 103, strike out the words "recessed seats in" and insert the same to follow after the word "with" in line 101; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of January, A. D. 1928.

Seal.

M. J. Moore,
Acting Commissioner of Patents.