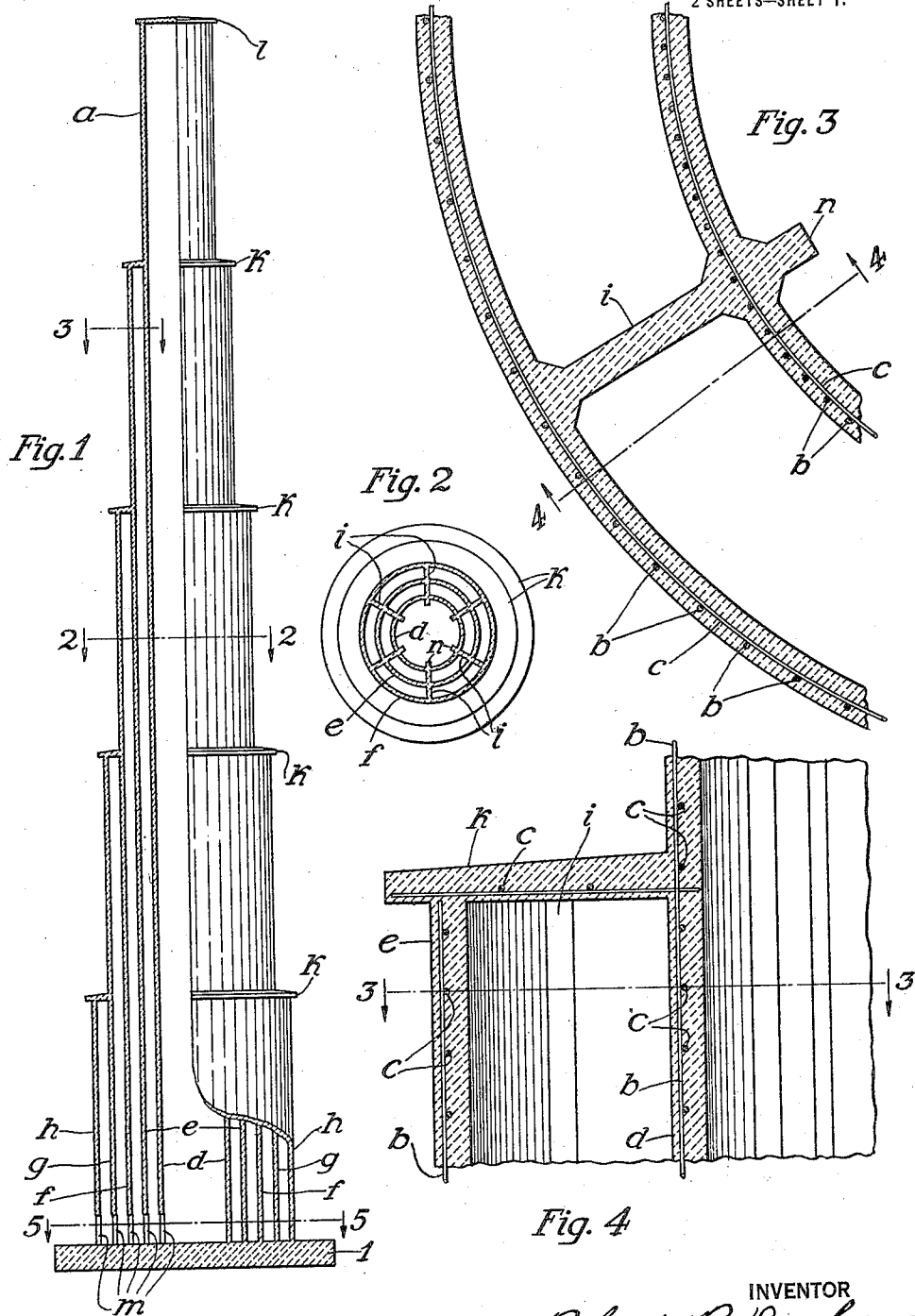


Patented Sept. 6, 1921.

2 SHEETS—SHEET 1.

1,390,102.

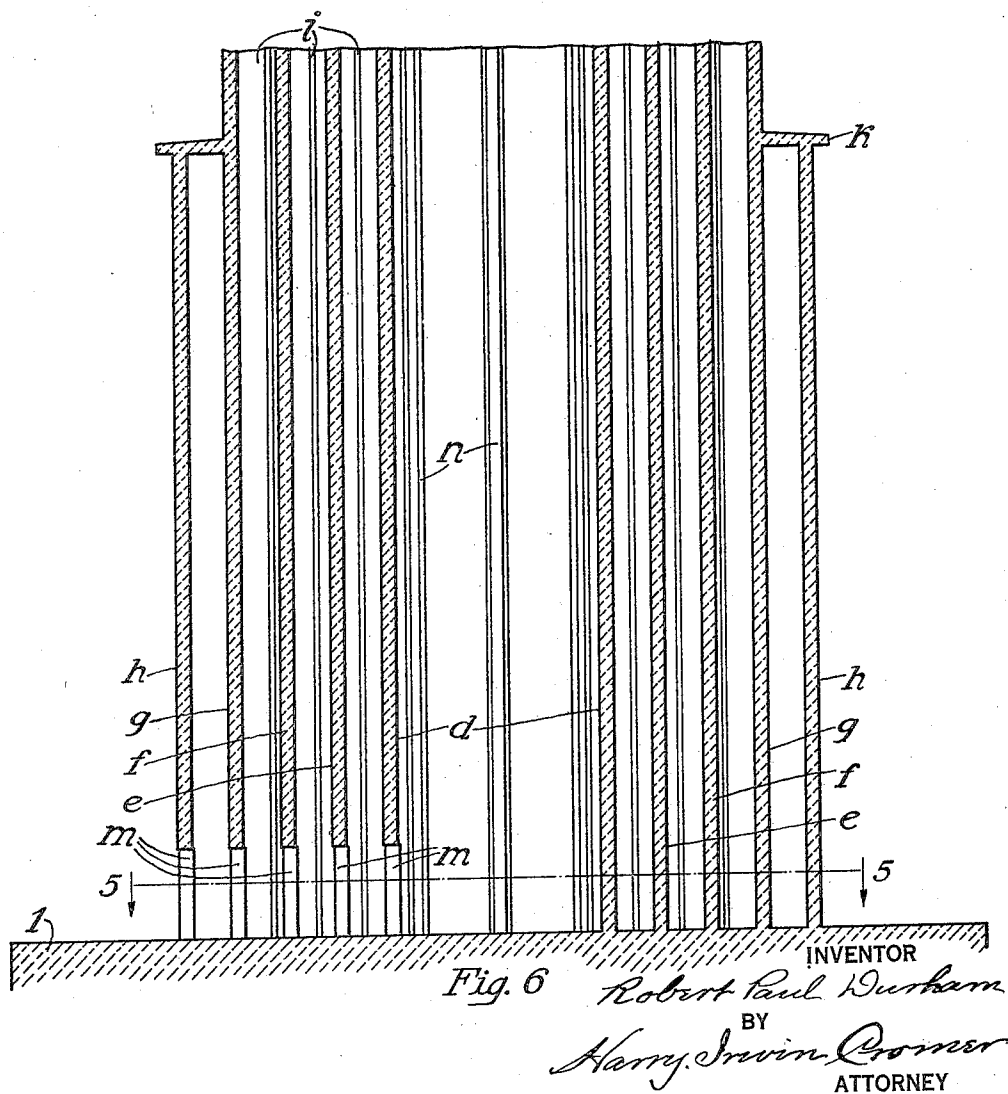
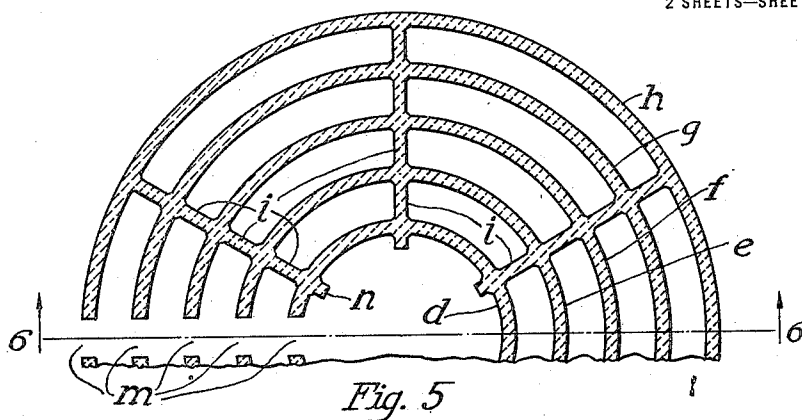


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1,390,102.

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TOWER.
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ROBERT P. DURHAM, OF CHICAGO, ILLINOIS.

TOWER.

1,390,102.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT P. DURHAM, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Towers, of which the following is a specification.

This invention relates to that class of towers or structures by means of which wireless telegraphic apparatus, signaling devices, or other apparatus or things to be employed for communication, or for signaling or other purposes, may be supported at an elevation suitable or desirable for the purposes to be accomplished.

The principal object of this invention is to provide a simple, economical and efficient tower or structure adapted to support at a desirable or suitable elevation wireless telegraphic apparatus, signaling devices, or other apparatus or things to be employed in an elevated position for communication, signaling or other purposes.

Other and further objects of the invention will appear from the following description and claims, and from an inspection of the accompanying drawings, which are made a part of this specification.

The invention consists in the features, combinations, arrangement of parts and details of construction herein described and claimed.

In the accompanying drawings:—

Figure 1 is a view in elevation of a tower or monolithic structure constructed in accordance with my invention; with a portion of the structure broken away so as to show substantially one half of the structure in central vertical section;

Fig. 2 is a horizontal sectional view taken on line 2 of Fig. 1, looking in the direction indicated by the arrow;

Fig. 3 is an enlarged detail view in horizontal section, taken on line 3 of Fig. 1 looking in the direction indicated by the arrow, and showing in section a portion of two circular or concentric cylindrical walls and a radial wall all formed in one integral piece of concrete provided with reinforcing metallic rods embedded in the concrete, as the same would appear in horizontal section taken on line 3 of Fig. 4, looking downward;

Fig. 4 is an enlarged detail view in vertical section, taken on line 4 of Fig. 3 look-

ing in the direction indicated by the arrow;

Fig. 5 is an enlarged view in transverse horizontal section, taken on line 5 of Fig. 1, looking downward as indicated by the arrow, with a portion of one side of the structure broken away; and

Fig. 6 is a similarly enlarged view in central vertical section through the structure as it would appear taken on line 6 of Fig. 5, looking in the direction indicated by the arrow.

In constructing a tower or monolithic structure in accordance with my invention, I provide a base 1 of suitable material, such, for instance, as concrete. The base may be of any desired well known, ordinary or suitable form.

On the base I erect the tower which is, by preference in the form of a monolithic structure *a* formed of concrete which is, by preference reinforced by means of metal reinforcing rods or strips *b* and *c*.

A very desirable form of tower, constructed in accordance with and embodying my invention, is shown in the accompanying drawings, and consists of or comprises in its construction a series of upright continuous, preferably cylindrical or circular and substantially concentric walls *d*, *e*, *f*, *g*, and *h*, all of which are spaced apart, and, by preference, formed of concrete reinforced by means of suitable metallic reinforcing rods or strips, such, for instance, as the reinforcing rods or strips *b* and *c*. It will be readily understood, however, that in some instances the metal reinforcing material may be dispensed with if desired. The inner wall *d* is the highest of the series of substantially concentric walls, and is surrounded by all of the other walls of the series. The outer wall *h* surrounds all of the other walls of the series, and is the lowest wall of the series. And each of the intermediate walls extends above the top of the next adjacent wall by which it is surrounded. Briefly stated, the series of substantially concentric upright, preferably circular or cylindrical walls, consists of or comprises an inner wall which is surrounded by all of the other walls of the series, an outer wall, and any desired number of intermediate walls all spaced apart and surrounded by the outer wall, each of the walls of the entire series being of greater height than the next

adjacent wall by which it is surrounded, so that the walls exceed each other in height consecutively or progressively in the order of their arrangement from the outside to the inside wall of the series.

Formed in one integral piece with the substantially concentric circular or cylindrical walls above described, is a series of radial concrete connecting and bracing walls *z* which are arranged at suitable intervals circumferentially of the structure in upright position and spaced apart with respect to each other. These radial walls connect each of the cylindrical or circumferential concentric walls with the next adjacent wall which it surrounds or by which it is surrounded; and at the top extremity of each of the concentric circular or cylindrical walls is an annular cap, cover or coping *k* which is made in one integral piece with the wall covered thereby, and also in one integral piece with the next adjacent inner wall which is surrounded by such cap, cover, or coping. And the innermost or highest wall is provided with a cover or cap *l*, which may be and, by preference, is integral with said wall.

Doors or openings *m* are provided at the bottom of the concentric walls *d*, *e*, *f*, *g*, and *h*, for permitting access to the interior of the structure. And projections *n*, which may be in the form of inwardly projecting extensions of the radial walls *z*, are provided on the inner side of the inner wall, for bracing and strengthening the structure, and also to provide convenient means for supporting any device or apparatus which it may be found desirable to mount within the interior of the structure, for instance, any means for gaining access to the top of the structure or to any part thereof, for any purpose.

In building a tower or structure of metal-reinforced concrete in accordance with my invention I employ a suitable vertically movable or adjustable form or mold, which may be of any desired or well known type, having substantially concentric upright mold walls suitably spaced apart and adapted to form all of the walls of the structure which may be of any desired proportions and dimensions suitable for the purposes to be accomplished.

Such molds or forms being in common use and well known to those skilled in the art, and requiring only to be made of suitable form and dimensions to form the tower walls by first molding the lower portions of all of the walls progressively but simultaneously, until the top of the outermost wall is reached; then discarding or dispensing with the outermost mold wall and continuing the progressive molding of all of the remaining walls simultaneously until the top of next tower wall is reached, and so on until the top of the tower is reached and the struc-

ture is completed, it is not deemed necessary to illustrate or further describe the mold or form to be used or the manner of using it. It is sufficient to say that the metal-reinforcing rods for forming the reinforcing metallic skeleton or frames for the lower portions of all of the walls are placed in position and suitably spaced apart so as to extend through the mold or between the mold walls in proper position; and the concrete mixture in plastic form and in suitable quantities is poured into the mold or forms so as to form the lower portions of all of the walls of the structure, preferably simultaneously and progressively, allowing the concrete or plastic mixture to set in the mold, then raising the mold in a step by step manner and pouring in another batch of the concrete or mixture in plastic condition and allowing it to set and harden in the mold, and so on progressively until all of the walls of the structure are formed and rigidly connected or united in a one-piece body, all connected in one integral piece and forming a one-piece or monolithic structure.

The radial walls which connect the continuous annular substantially concentric walls are, by preference, formed in one integral piece with the concentric or continuous circular walls; and the annular covers or caps *k* may also be formed while the upper extremities of the walls to be covered thereby are in a plastic condition, so that the entire structure or body of the tower is in one connected or integral piece or body forming a well braced, strong and rigid one-piece structure.

It will be readily apparent to those skilled in the art, however, that it is not so important that the annular covers *k* should be formed integrally with the upright walls, and that the tower or structure will be sufficiently strong and rigid either with or without the caps or covers *k*, or whether said caps are in one integral piece with the upright walls or not. But it is important that the continuous circular or annular upright walls and the radial connecting wall or walls should be formed together and in such a manner as to form a continuous unitary or one-piece body or structure, which, in the form herein shown and described, embodies my invention and enables a tower of great height and strength in comparison with the quantity of materials used, to be economically constructed. A tower constructed as herein shown and described has the advantage of being economical in construction, strong and durable.

I claim:

1. A tower comprising in its construction a base, a series of substantially concentric upright continuous walls, all mounted on and extending upward from said base and spaced apart throughout their entire length

vertically from said base upward to the tops thereof, said series comprising an inner wall, an outer surrounding wall, an intermediate wall surrounding the inner wall and surrounded by the outer wall, each of said walls being of greater height than the adjacent wall by which it is surrounded, and connecting means forming a rigid connection between a plurality of said walls.

2. A tower comprising in its construction a base, a series of substantially concentric upright continuous walls all mounted on and extending upward from said base and spaced apart throughout their entire length vertically from said base upward to the tops thereof, and comprising an inner wall, an outer surrounding wall, an intermediate wall surrounding the inner wall and surrounded by the outer wall, each of said walls being of greater height than the adjacent wall by which it is surrounded, and a radial connecting wall formed integrally with and forming a rigid connection between a plurality of said walls.

3. A tower comprising in its construction a base, a series of upright continuous walls all mounted on and extending upward from said base and spaced apart throughout their entire length vertically from said base upward to the tops thereof, and comprising an inner wall, an outer surrounding wall, an intermediate wall surrounding the inner wall and surrounded by the outer wall, each of said walls being of greater height than the adjacent wall by which it is surrounded, and a radial connecting wall adapted to form a rigid connection between a plurality of said walls, all of said walls being formed in one integral piece and forming a unitary one-piece structure.

4. A tower comprising in its construction a base, a series of upright continuous walls all mounted on and extending upward from said base and spaced apart throughout their entire length vertically from said base upward to the tops thereof, and comprising an inner wall, an outer surrounding wall, a plurality of intermediate walls all surrounding the inner wall and surrounded by the outer wall, each of said walls being of greater height than the adjacent wall by which it is surrounded, and a radial connecting wall

connected with and adapted to form a rigid connection between said walls, all of said walls being formed in one integral piece and forming a one-piece structure.

5. A tower comprising in its construction a base, a series of continuous upright walls formed of concrete and all mounted on and extending upward from said base and spaced apart throughout their entire length vertically from said base upward to the tops thereof, and comprising an inner wall, an outer surrounding wall, a plurality of intermediate walls all surrounding the inner wall and surrounded by the outer wall, each of said walls being of greater height than the adjacent wall by which it is surrounded, and a plurality of radial connecting walls connected with and forming a rigid connection between all of said walls, all of said walls being formed in one integral piece and forming a rigid one-piece structure.

6. A tower comprising in its construction a base, a series of substantially concentric upright continuous walls formed of metal-reinforced concrete and all mounted on and extending upward from said base and spaced apart throughout their entire length vertically from said base upward to the tops thereof, said series comprising an inner wall, an outer surrounding wall, and a plurality of intermediate walls surrounding the inner wall and surrounded by the outer wall, each of said walls being of greater height than the adjacent wall by which it is surrounded, a plurality of radial connecting walls connecting all of said concentric walls, all of said walls being rigidly connected and formed in one integral body and forming a rigid one-piece structure, a cover at the top of the inner highest wall, forming a top closure for the space surrounded by said wall, and a cover at the top of each of the concentric walls surrounding said inner highest wall.

Signed at Chicago, in the county of Cook and State of Illinois, this 29th day of December, 1919.

ROBERT P. DURHAM.

Witnesses:

HARRY I. CROMER,
W. HARDING.