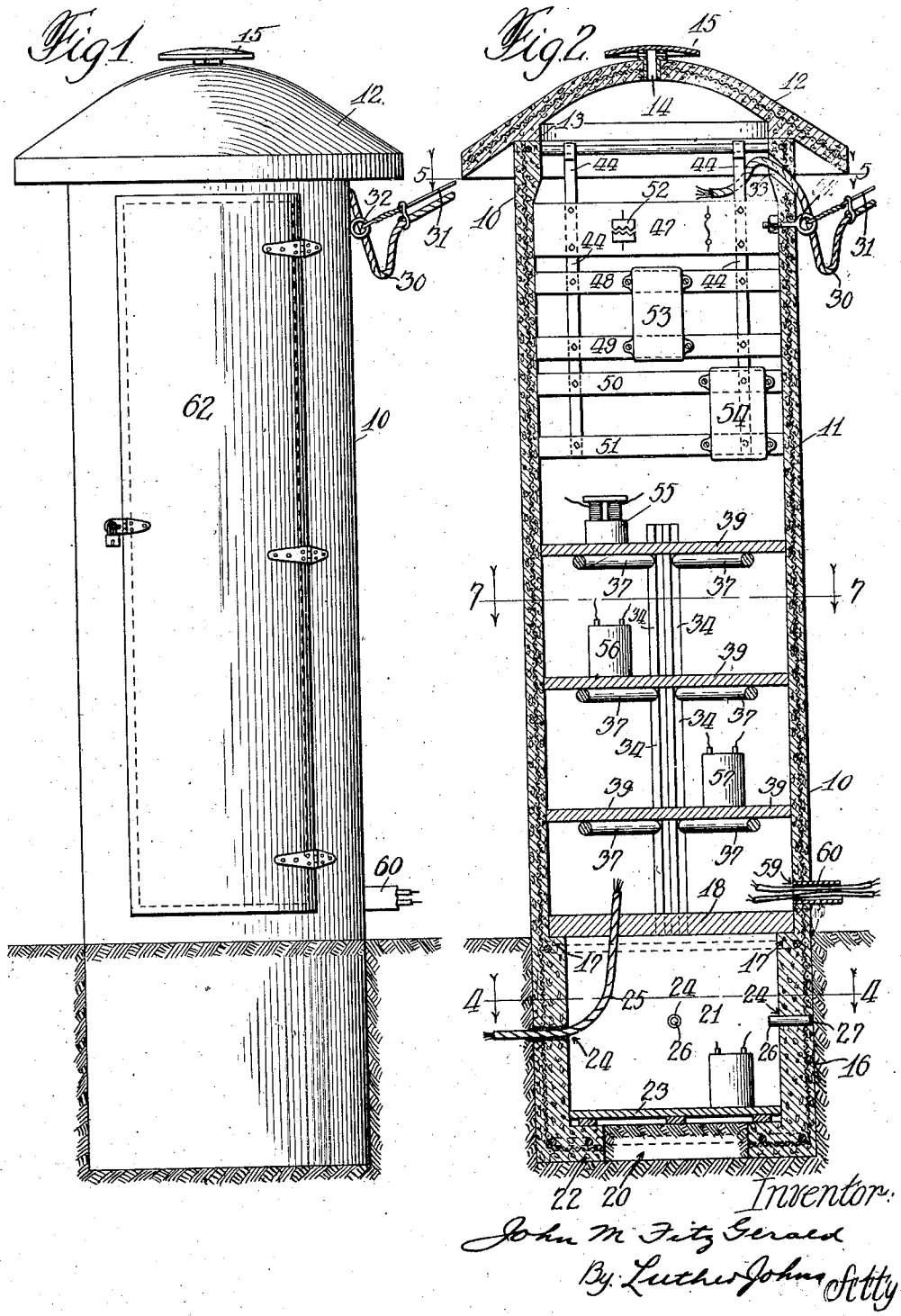
Feb. 15, 1927. 1,617,626

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HOUSING STRUCTURE

Filed July 23, 1923 2 Sheets-Sheet 1



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HOUSING STRUCTURE

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Fig. 3

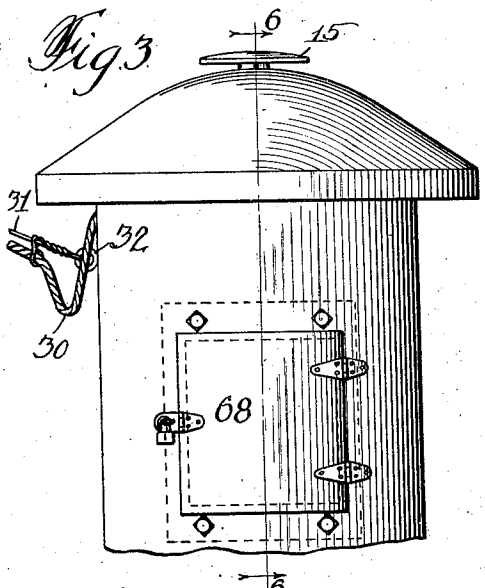


Fig. 6.

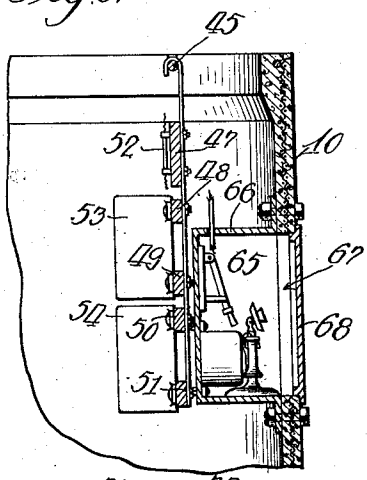


Fig. 4

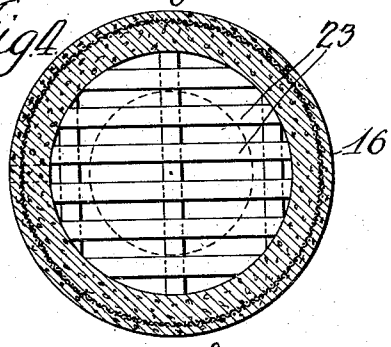


Fig. 7.

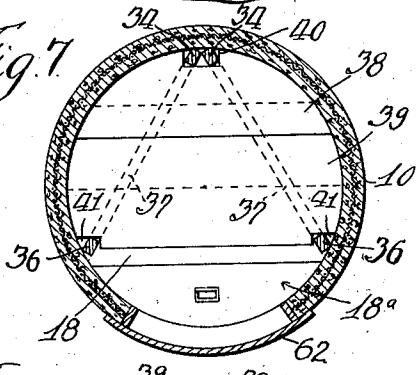


Fig. 5.

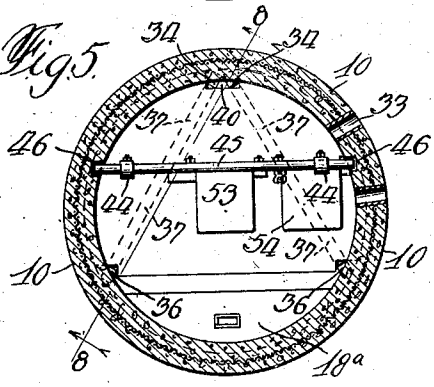
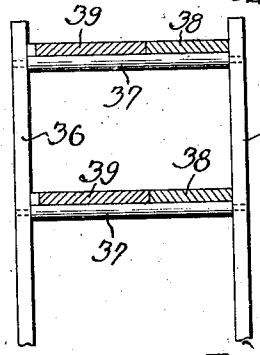


Fig. 8



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UNITED STATES PATENT OFFICE.

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HOUSING STRUCTURE.

Application filed July 23, 1923. Serial No. 653,388.

These improvements relate to housing devices. An important application thereof is in connection with electrical installations, and notably in connection with electric signal and telephone installations along the right-of-way of railroads.

Since the successful and safe operation of railroads depends upon the integrity of the signal system which, under present day conditions, is complicated and subject to many destructive influences, there is a constant and widespread search for methods and means for safeguarding and insuring the operativeness of the system, and the principal object of the present improvements is to provide means for furthering this end. More specifically it is an object to provide a housing structure in which may be consolidated a considerable number and variety of electric instruments necessary along the line in railway signal and telephone practice, and to provide a housing device of such form, arrangement and construction as to make possible the convenient installation, inspection, replacement, repair and use of the various instruments and their connections, with conditions of safety from the weather and from unauthorized or maliciously-inclined persons, and whereby through the centralization of such instruments in a relatively small space the time and labor of inspection, replacement, repair, etc. are minimized. It is an object to provide a substantially low-cost, strong and durable housing structure having such advantages and in a form which may relatively easily be installed, by comparatively few men, and without the requirement of special hoisting machinery, thus saving much expense; and also to provide such a housing device which is of neat and attractive appearance, important in such right-of-way work.

Among the advantages and objects accomplished are the saving of much expense in installation and of much current expense in maintenance of the system and housing through the elimination of many scattered structures both above and below the surface of the ground, with their many attendant connections, thus substituting notable safety, simplicity and relatively low cost of installation and subsequent maintenance for much hitherto complexity and wastage of time and money, and in the substitution also of notably great security for notable insecurity according to prior practice.

Heretofore it has been the custom to provide battery wells under ground; to provide such devices as relays, lightning arresters, rectifiers, meters, switches, etc. on poles above ground, each encased in some sort of protective housing, the instruments usually being difficultly accessible, expensive in both installation and maintenance due to various causes, with the various apparatuses and their connections exposed to injury, either malicious or accidental, and notably to fire hazards due to conflagrations of nearby wooden structures, underbrush, etc., on the right-of-way. Telephones have been installed in relatively large booths, at great cost; and, since the telephones are required for use by the maintainer of the signal system and is frequently the best means for obtaining quick action, the location of telephone booths at widely separated intervals is particularly disadvantageous at the time of emergency. It is an object of the present improvements to overcome all such objections. It is an object to provide a housing structure which may have all of the advantages mentioned and which will not permit occupancy by a person for various other purposes than the legitimate ones for which the device is formed, thus avoiding serious objections to booths or housing structures hitherto suggested for use along the right-of-way. Still other objects and advantages will appear hereinafter.

In the accompanying drawings, which form a part of this specification, Figure 1 is a face view or elevation of my improved housing structure in a preferred and highly advantageous form; Fig. 2 is a medial vertical section of Fig. 1 showing an advantageous form of supporting means for electrical instruments, a few of which are shown merely for exemplification; Fig. 3 is a fragmentary view of the upper end of the device of Fig. 1 from the reverse or opposite side thereof showing a door leading to an auxiliary chamber within the main structure; Fig. 4 is a sectional view on the line 4—4 of Fig. 2; Fig. 5 is a sectional view as on the line 5—5 of Fig. 2; Fig. 6 is a fragmentary sectional view on the line 6—6 of Fig. 3; Fig. 7 is a sectional view as on the line 7—7 of Fig. 2; and Fig. 8 is a fragmentary sec-

tional view of a supporting frame as on the line 8—8 of Fig. 5.

My improved housing structure comprises a relatively long and narrow tubular body part which is shown as cylindrical from end to end. As made my me this body is of reinforced concrete, the metallic reinforcing 11 thereof extending from top to bottom and into the bottom and which reinforcing may be of any approved form. The body is provided with a roof or cover 12, also shown as being of reinforced concrete, the roof having an annular projection 13, Fig. 2, which seats upon the top of the body and is held in position by its own weight and its downwardly extending eaves. A ventilating duct 14 opening beneath the cover 15 provides ventilation for the hollow interior.

The body part 10 extends normally above ground while the body part 16 extends normally a materially great distance below the ground surface. The part 16 adapted to extend below ground has its annular side walls preferably thickened to provide a strong annular ledge or seat at 17 for a removable cover 18 of planking, which cover constitutes the floor of the main structure, and, according to the construction or shelving illustrated, carries the weight of a considerable number of batteries and other instruments.

The bottom of the housing structure has a materially large opening at 20, but this opening is preferably not as great in diameter as that of the hollow interior of the subterranean well 21. With an inwardly-extending bottom wall 22 a better seat is had for the structure, important when it is positioned in soft or fairly soft earth. The opening 20 permits the application of filling and tamping tools from the inside of the structure whereby after the body is positioned in a hole dug for it its seat upon the earth at the bottom may be made firm in an easy and convenient way, and this construction also facilitates the vertical positioning of the housing structure as a whole on a solid seat. Without such a provision as the opening 20 the hole in the earth in which the device is positioned would have to be relatively large, and even then the best results in seating and vertically positioning the structure could not be obtained. With such an opening as 20 in the bottom of the body the hole in the earth may be only substantially large enough to permit the device to enter it. Ordinarily the opening 20 will not be required to be sealed, but if it should happen, for instance, that an undue amount of moisture is present in the earth at a particular installation this opening 20 may be filled with concrete well grouted to the main structure. A floor 23 of strips of wood is adapted to support batteries or other instruments, and this chamber 21, having a tight cover 18 constitutes a subterranean battery well which is well protected against frost. The front plank section 18ª, Fig. 7, may readily be lifted away to provide entrance to the well 21.

Openings 24 (Fig. 2) are preferably formed, by coring the concrete, for the admission of underground cables as 25, and after a cable is inserted the space between the cable and the wall at 24 is preferably packed, as with waste and asphaltum, to exclude moisture. Wooden plugs 26 are initially driven tightly into these holes 24, and beyond the outer surface of the structure wall, and the space at 27, Fig. 2, filled either with concrete or some other moisture-excluding substance, the construction being such that a plug or plugs 26 may be knocked out from the inside of the structure should such an underground cable or cables be desired to be used.

In the form and construction adopted by me, and as illustrated, the main structure has an interior diameter in the main body part of thirty-six inches, the concrete wall thereof being one and one-half inches thick, the wall of the subterranean well part being three inches thick. The cylindrical shape provides the least resistance to the wind, and it also greatly facilitates handling since the structure may be rolled about by a few workmen and may be installed without special hoisting apparatus. It also makes for a neat and attractive appearance. It is also a simple form to produce.

The present housing device is designed to accommodate a considerable variety of electrical instruments in communication with signal wires carried by poles along the right-of-way and also connected in some instances to the track rails and with instruments otherwise positioned. The most convenient and advantageous way for leading wires from a considerable number of such instruments to the aerial line wires is by means of an aerial cable, such as 30. The length of such cable may be materially great and ordinarily it would be supported by a messenger wire 31 which is shown as being secured to an eye bolt 32 passing through the wall 10 near the top thereof. A downwardly-and-outwardly slanting hole 33 admits the cable to the interior of the structure near the top thereof and under the eaves of the roof, this construction providing against the objectionable entrance of rain and snow at the opening 33. This opening 33 may be packed if desired. The weight of the cable 30 and messenger wire 31, together with accumulations of snow and ice thereon and the force of the wind upon them, tend to draw the structure out of its vertical position. A highly important feature of the construction in this connection is the provision of that materially large part which extends below the surface

of the ground which is tightly embedded in the ground, and which thereby secures and maintains the structure strongly in its established position, and gives the structure as a whole the character of a firmly-imbedded post.

This arrangement enables me in simple, cheap and otherwise highly advantageous ways to provide means for housing a large number and variety of instruments for connection with line wires according to established and preferred usage, namely by leading a cable or cables or single wires from an elevated position aerially to their respective places of connection with other aerial wires or devices.

Convenient means for supporting batteries and instruments within the main housing structure are shown as a pair of frames, Fig. 7, each having uprights 34 and 36 and connecting pieces 37 with two boards 38 and 39 resting on the cross pieces 37. I have shown three tiers of such shelving (Fig. 2). It will be noted from Fig. 7 that the board 38 is notched at 40 to accommodate and form a lock for the two frame uprights 34, holding them in place, and that the board 39 fits against the board 38 and also against the uprights 36, and that the board 39 is notched at 41 to form a lock which prevents the uprights 36 from moving toward each other. The construction is such that the separate frames and shelving boards may readily be assembled and locked in their desired positions, and may be readily removed from time to time as may be desired.

I also provide an instrument board comprising a pair of straps 44 each formed with a hook at the top and hanging thereby upon a rod 45 resting at its ends in open seats 46 recessed downwardly in the side wall 10 of the main structure. Boards 47, 48, 49, 50 and 51 are shown as being secured in spaced-apart relation upon the straps or hangers 44, as by bolts. These boards, extending to the curving sides of the body, hold the instrument board or panel as a whole in vertical position. The panel as a whole may be unhooked and thus be readily removed bodily for work upon the instruments and their connections. It may also be swung upward and toward the doorway to some extent to provide access to the rear thereof. The shelving may also be readily removed for any purpose. I have shown a few instruments such as a lighting arrester 52 and rectifiers 43 and 54 mounted on this instrument board. A relay 55 and batteries 56 and 57 are shown as resting on the shelving.

An opening 59 adapted to accommodate a trunking box 60 is cored in the side wall 10 near the ground line for wires customarily carried in such conduits.

A sheet metal main door 62 is securely hinged to the side wall 10 and is provided with a hasp and staple connection for a padlock by which the door may be locked. The relatively long and narrow door 62 covers the doorway shown by dotted lines in Fig. 1 and this entrance is sufficiently high to permit a person to stand at the doorway and inspect or work upon with ease the various instruments before him. From Figs. 5 and 7 it will be noted that the shelving occupies most of the space in lines straight back from the doorway and that there is but small space within the housing for the body or part of the body of the inspector or other person. It would be very inconvenient to enter the structure and close the door. There is thus provided a substantial check against the commission of serious and common nuisances within the booth by persons having access into it.

In the construction illustrated I have made a special provision for various instruments whereby the same may be examined and used without opening the main door 62 or otherwise gaining entrance to the main compartment. After the instruments in the main compartment are installed they will ordinarily require only occasional attention or inspection, and by special employees. It is highly desirable to preserve the instruments in the main compartment from all possible interference, as well as from the weather, which is best accomplished by making unnecessary the opening of that compartment for other purposes than actual attention to the instruments and their connections therein, and according to the present invention in this respect these instruments are securely locked in the main compartment and in the subterranean well not only against all unauthorized persons, but means are provided whereby even authorized employees have only an occasional reason for opening the main door 62. To accomplish this I have provided, for meters, telephone, switches, etc., an auxiliary compartment 65 within the main compartment and formed by a metallic box-like structure 66 bolted to the inside of the side wall 10, which side wall is provided with an opening 67 closed by the hinged and pad-locked metallic door 68. The sightliness of the structure as a whole is preserved by placing the auxiliary compartment within the main structure, and these other instruments are thus also more securely housed.

I have thus shown means for consolidating a large number and variety of electrical instruments in a relatively small space, and so positioned as to be readily accessible, with the advantages of a subterranean battery well, and with all the instruments unusually securely and strongly housed against interference, with convenient means for leading cables or other wires from the structure, with the structure maintained rigidly

against tilting strains due to the weight of aerial line wires leading from the upper part of the device, with provisions for current inspection and use of certain instruments without opening the main compartment, together with advantages in cost, installation and maintenance of an unusual kind, providing means for simplifying all features of practice in connection with the installation and maintenance of the electric system, greatly improving the safety of the system, and reducing the number of installations along the right-of-way, and in many other ways well to be appreciated by those skilled in the art simplifying and improving what is perhaps the most delicate and important features of railroad practice.

I contemplate as being within this invention such changes, modifications and departures from what is herein specifically illustrated and described as fall within the scope of the appended claims.

I claim:

1. A relatively long and narrow tubular housing device of the character described having a roof and adapted to be positioned vertically and to extend upward from the ground to a materially great height, a side wall of the device having a relatively long and narrow upwardly extending doorway, a door for said doorway adapted to close the same tightly, the device having means near the top thereof for holding aerial electric wires, means for supporting electrical instruments within the device for ready accessibility through said doorway, walls forming an auxiliary compartment within the hollow interior of said housing above the ground, said auxiliary compartment having a doorway through a wall thereof, and a door and door-locking means for said last-mentioned doorway, a portion of said housing being adapted to extend a materially great distance below the surface of the ground and to constitute a subterranean well when the device is normally in use.

2. A relatively long tubular housing structure body of the character described formed as a unit, and having a roof formed as a unit and adapted to be applied after the body unit is erected, said body being adapted to be positioned vertically and comprising a part which extends upward from the ground a materially great distance and having a rigidly attached part adapted to extend a material distance below the surface of the ground, the part below the ground surface being adapted to constitute a subterranean well, a readily removable cover for said well, the walls forming said well being open to the earth at the bottom of the device, the side wall of the device having a doorway and a door therefor, and means for holding electrical instruments in that part of the device normally above the ground surface.

3. A combined battery well and instrument housing device of the character described having a relatively long tubular body part extending normally above ground a materially great distance, and a hollow part extending normally below the surface of the ground, a partition between said compartments, said partition being formed to provide access from the upper compartment to the lower compartment, the upper compartment having a doorway and a door therefor, means within the hollow interior for holding electrical instruments readily accessible through said doorway when open, the upper compartment having an opening for an aerial cable or the like in the upper portion thereof, the bottom wall of the device being open to a materially large extent for tamping when the structure is being positioned in the earth, walls forming an auxiliary housing within the tubular body part and having an opening through a wall of said body part, and a door for said last-mentioned doorway.

4. A housing device comprising a relatively long and narrow tubular structure adapted to be installed vertically in a hole in the ground and having a doorway and a door therefor, said structure having a bottom with a materially large opening therein for filling and tamping through said doorway.

JOHN M. FITZ GERALD.