METHOD OF PRODUCING A SEISMOGRAPH DRILL HOLE CASING

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Fig. 1.

Fig. 2.

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METHOD OF PRODUCING A SEISMOGRAPH DRILL HOLE CASING

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The present invention relates to cases designed to line the walls of seismograph drill holes or shallow wells, and is concerned primarily with such a casing which will fulfill the conditions of service usage and yet may be produced at a relatively low cost.

Hitherto, it has been the practice not to line or case seismograph drill holes because of the cost and expense attending the provision of metallic casings for such holes. However, when these holes are left uncased they are subject to caving, plugging, and similar action on the part of the geological formations in which they are formed, with the ultimate result in a practical embodiment, it will be difficult if not impossible to introduce explosives thereinto. Thus it has been necessary to clear the holes, which is an expensive operation and something to be avoided.

Any casing provided for a seismograph drill hole must, as an essential requirement, be a low-cost casing. Yet, at the same time it must be water and moisture resistant and of sufficient strength to withstand the pressures ordinarily created by the tendency of the walls to cave. Moreover, the casing must be susceptible of being manufactured in sections of standard length and which sections are provided with coupling means for assembling a plurality of the sections into a continuous casing.

With the foregoing conditions in mind, the invention has in view as an important object the provision of a casing of the character indicated which is made of spirally wound or wrapped paper impregnated with wax, and which is particularly adapted to being cut into sections, with the sections being susceptible of being connected by light sheet-metal couplings which are in themselves the epitome of simplicity.

More in detail, the invention has an object the provision of a method of producing a seismograph-drill-hole casing of the character aforesaid which consists in the steps of first cutting a spirally wrapped paper tube of appropriate diameter and wall thickness into sections of standard length. These paper-tube sections are then saturated in a bath of molten microcrystalline wax at a temperature low enough to make the first bath. The ends of the tubes are then reamed out to adapt them for insertion thereinto of portions of internal couplings.

Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the conventional ideas in a practical embodiment, will in part become apparent and in part be hereinafter stated as the description of the invention proceeds.

The invention comprises a seismograph-drill-hole casing consisting essentially of a spirally wound paper tube saturated with wax and divided into standard sections, with the several sections connected by internal sheet-metal coupling elements each having a central bead and outwardly extending projections or tans on the opposite sides of the bead, together with the method of producing the tube.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawing, wherein:

FIGURE 1 is a perspective view depicting one of the coupling elements and the end portions of two tube sections to be connected thereby in exploded relation; and

FIGURE 2 is a longitudinal section through the tube elements with a portion of the coupling being broken away.

Before referring to the drawings, it is to be noted that the present invention was evolved primarily with seismograph drill holes in mind. However, the casing hereinafter is also susceptible of use in other places where the service conditions are comparable, and among which might be noted shallow wells, water wells, conduits, and the like.

In producing the seismograph-drill-hole casing of this invention, paper is first spirally wound or wrapped into a tube. Thus, by way of example, it will be noted that the tube so formed has a wall thickness of 0.09 inch and an internal diameter of approximately 3 inches. Such a tube is cut into sections of standard length such as 10 feet. Thus, in one embodiment of the invention, each section will be 10 feet long, have an internal diameter of 3 inches, and a wall thickness of 0.09 inch.

These paper-tube sections are now immersed in a bath of molten microcrystalline wax at a temperature of 230°F. and for a time period of approximately 2½ hours. This time period and temperature are, of course, susceptible of some variation, although they may be considered as optimum.

At the expiration of this saturation period, they are removed and permitted to cool to ambient or room temperature. They are then redipped in a bath of the same molten microcrystalline wax at a temperature of 170°F. This is a pure dipping operation, and the tubes do not remain immersed in the bath for any prolonged period. The ends of the tubes are then reamed out for a distance and to a depth sufficient to accommodate the metallic coupling elements, to be described. What is desired, if not actually required, is that after the sections are joined by the coupling elements the internal bore will be substantially uniform and constant throughout the casing.

Referring now to the drawings, a coupling element is referred to in its entirety by the reference character C; and portions of two tube sections which are to be joined by the coupling element are shown at T and T'.

The assembled relation is depicted in FIGURE 2, and it will be noted that the tube sections T and T' are substantially alike. Each of these sections has an internal bore 10 which extends throughout the main body portion but which is slightly enlarged into a countercore at 11 which is produced by the reaming-out operation above described. Between the bore 10 and countercore 11 there is a slight shoulder 12. The free-end edge of each tube section is designated 13.

The coupling member C is formed from galvanized sheet metal, such as galvanized iron, which is quite thin and fashioned into the cylindrical formation illustrated. The ends of the piece of sheet metal overlap and are secured together in any preferred manner, such as by the spot welding depicted at 14.

The coupling member C is formed with a comparatively slight external bead 15 which functions as a tube stop. Thus, in the position depicted in FIGURE 2, the ends 13 of the tube sections T and T' meet at the bead 15.

On each side of this bead 15, and preferably more closely adjacent to the ends of the coupling element C, the latter is formed with external tans or projections 16 which are struck from the sheet metal from which the coupling member is formed. It will be noted that these tans or projections 16 extend radially outwardly but axially inwardly towards the bead 15 and away from the free ends of the coupling member.

The assembly of the coupling member C with the adjacent ends of the tube sections T and T' is a simple
stabbing operation; that is, the ends of the tube sections are simply forced over the respective end portions of the coupling elements and the operation continued until the free-end edges of the tube sections 13 meet over the bead 15 as shown in FIGURE 2. In this position, the free ends of the coupling will lie substantially at the shoulders 12. This stabbing operation is accommodated by the inclined disposition of the tangs or projections 16. However, should the tube sections T and T', or either of them, exhibit any tendency to be withdrawn or pulled from the coupling element, the tendency will be resisted by the edges of the tangs 16 biting into the wax-impregnated paper from which the tube sections are formed.

While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact specifications, steps, and materials illustrated and described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

What is claimed is:

1. In the production of seismograph-drill-hole casings, the method comprising the steps of (a) spirally wrapping paper into a tube, (b) cutting the tube into sections of standard length, (c) saturating said sections in a bath of microcrystalline wax at a temperature of 250° F., and for a time period of 2½ hours, (d) removing said sections from said bath and cooling to room temperature, (e) redipping said tube sections in a bath of said wax at a temperature of 170° F., and (f) then reaming out end portions of said tube.

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