Dec. 10, 1940. J. W. FLUDE 2,224,565

CASING FOR BOREHOLES

Filed Aug. 31, 1937

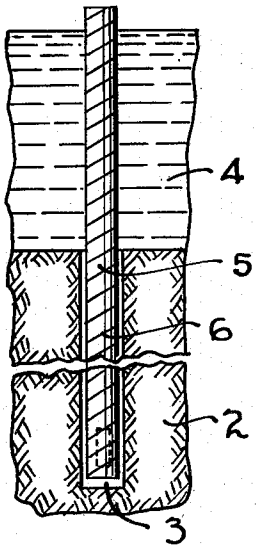

Fig. 1.

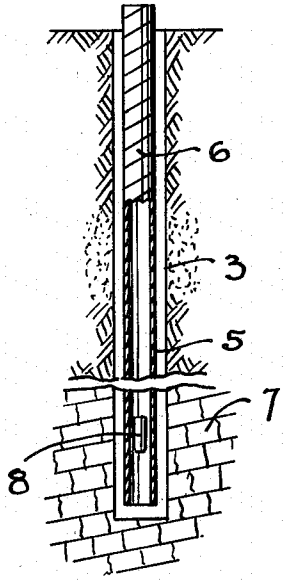

Fig. 2.

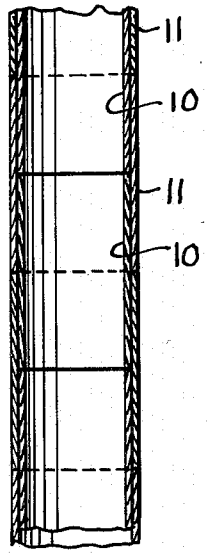

Fig. 3.

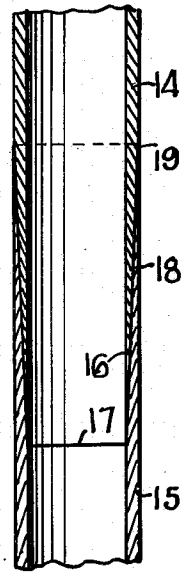

Fig. 4.

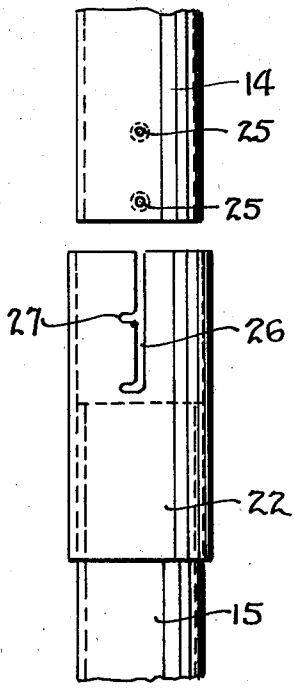

Fig. 7.

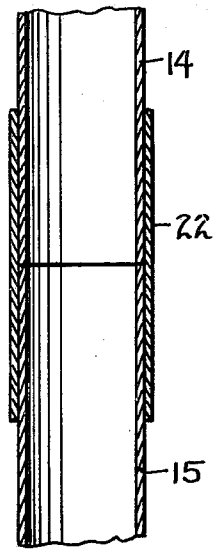

Fig. 6.

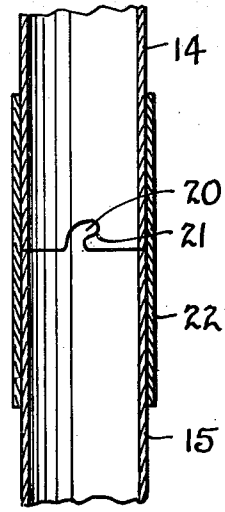

Fig. 5.

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Patented Dec. 10, 1940

2,224,565

UNITED STATES PATENT OFFICE

2,224,565

CASING FOR BOREHOLES

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Application August 31, 1937, Serial No. 161,770

3 Claims. (Cl. 166—4)

The invention relates to a casing for boreholes of the type which will provide only a temporary support for the formation through which the bore penetrates.

In the art of geophysical prospecting it is the practice to provide a more or less shallow borehole which may vary from 30 to 100 feet in depth so that a charge of explosive may be deposited in the borehole. The shock of this explosion sets up vibrations in the earth formation and it is the practice to detect and record these vibrations.

The borehole is only used for this temporary operation but even for such a short period of time it is desirable in many instances to provide a casing in the borehole or a support for the formation during this operation so that the explosive may be properly positioned.

It has been the practice in the past to provide a metal casing for these boreholes, but a casing of this sort forms an obstruction after its utility has been served if it is left in the borehole. The operation of pulling this metal casing from the hole is expensive and requires equipment so that in many instances the metal pipe thus used for casing remains in the hole, forms an obstruction in the field and in the event it is in a submerged area will form an obstruction to navigation.

It is the object of the present invention to provide a casing which will serve the temporary purpose and will thereafter become disintegrated to such an extent that it will not form an obstruction and need not therefore be removed.

It is one of the objects of the present invention to provide a fibre casing for boreholes.

Another object of the invention is to provide a borehole casing which is made of fibre. Still another object of the invention is to provide a paper casing for well bores.

Still another object of the invention is to provide a casing for bore wells which is made up of fibre sections adapted to be connected to each other as the sections are lowered into the well bore in order to form a continuous casing.

Still another object of the invention is to provide an interlocking connection for paper tubes so that they may be connected together to be used as a well casing.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawing, wherein:

Figure 1 is a vertical sectional view of a submerged earth formation in which a borehole has been formed and the temporary casing of this invention inserted therein.

Fig. 2 is a vertical sectional view of an earth formation showing the casing in position and a portion thereof illustrated in section to show the position of the explosive in the casing.

Fig. 3 shows a broken sectional view of a connection or coupling for joining adjacent sections of the casing together.

Fig. 4 shows a sectional view of another form of coupling or connection.

Figs. 5, 6 and 7 show three other modifications of the joint or coupling for connecting the sections of tubing together.

As seen in Fig. 1, an earth formation 2 has been penetrated by a borehole 3. In this particular instance the formation 2 is surmounted by a body of water. With this condition existing it is obvious that it is necessary to guide the explosive charge downwardly through the water and into the opening of the borehole 3 and that it is also necessary to avoid caving within the borehole until the charge of explosive is desirably positioned therein. It is likewise desirable to guide the charge past any obstructions that may protrude into the borehole from the walls thereof. To satisfy these requirements a casing 5 has been passed downwardly through the body of water 4 into the borehole 3. This casing is shown as having been made up by spirally wrapping a strip 6 of paper, cardboard or fabric so as to provide a tubular member or casing 5. In the view shown in Fig. 1 the casing has been made as a single integral unitary tube of the desired length so that it will extend to the surface of the liquid 4.

These tubes or sections could be waterproofed to some extent so that it would remain intact for a short period of time but would eventually absorb sufficient water to cause it to disintegrate and in this manner it would not form an obstruction to navigation after its purpose as a casing had been served. It would not need to be removed and within a very short period it would become water-soaked.

It is to be understood that any desired fibre or fabric or other suitable material may be used to construct tubes of this sort, the essential feature of the invention being to provide a tube which will not form a rigid obstruction after having been used, but, on the other hand, which will be sufficiently rigid for a short period of time to withstand the pressures encountered and to hold back the formation so as to maintain the borehole open until after the shot or explosion has occurred.

Fig. 2 shows a sectional view somewhat similar to Fig. 1 wherein the casing 6 passes into a solid formation 7 and the charge of explosive 8 is shown as being deposited in the formation. Where the borehole is on a farm or cultivated area the tube will not interfere with the tilling of the soil and need not be removed.

Fig. 3 shows an assembly of short sections 10 of paper or fabric tubing which are alternatively telescoped into similar sections 11, which are of slightly greater diameter. These short sections are alternated as seen in Fig. 3, in order to provide a tube or casing which will have sufficient strength to support itself and to prevent caving of the formation. These short sections may be telescoped together and held in place by suitable adhesive or they may be closely fitted together so that they will maintain a frictional grip upon each other.

Fig. 4 shows an arrangement where one section of casing 14 is telescoped into another section 15 where the interfitting parts are each provided with a tapered end. The section 14 has its outer surface tapered at 16 to a thin edge at 17, while the section 15 has its inner surface 18 tapered to a thin edge at 19. These two parts can in this manner be wedged together to form a connection between the sections of tubing which when assembled together make up the casing.

Fig. 5 shows a form of connecting the sections 14 and 15 by providing an interfitting tongue 20 on the section 15 and a groove or recess 21 in the section 14 which is arranged to receive the tongue 20. When these two parts are in this manner interlocked a sleeve or coupling 22 may be passed over the parts so as to hold them securely together.

In Fig. 6 the sections 14 and 15 have been abutted under the end and the coupling 22 passed thereover so as to hold the parts firmly in position.

It has been found that a heavy type of tube similar to heavy duty mailing tubes or tubing of cardboard or fibre board can be used to advantage because the diameter of such tubing will usually vary from two to six inches.

In Fig. 7 the section 14 has been provided with a plurality of pins or lugs 25 on its periphery and these are arranged to be received in the slot 26 in coupling 22 which is fixed to the section 15. Lateral pockets 27 are arranged to receive the pin 25 in the form of a bayonet joint so that when the section 14 is passed into the coupling and slightly rotated it cannot thereafter be withdrawn.

It is intended that these sections of tubing may be coupled together in any desired manner and may be merely wrapped with wide adhesive tape or they may be roughly threaded so that a solid joint or connection will be provided which will have sufficient strength to support the adjoining sections as the casing is lowered into the well bore.

Broadly the invention contemplates a casing made up of a material which will readily deteriorate so as to avoid the objection that it will remain as an obstruction after its utility has been served.

What is claimed is:

1. A borehole casing for geophysical prospecting, consisting of a tubular casing of a length suitable for supporting the walls of a borehole for seismic blasting, said casing being formed of a partially waterproofed, fibrous composition having a stiffness capable of withstanding the exterior pressure exerted by the walls of a borehole, being capable of suspending its own weight when lowered into a borehole, and being adapted to temporarily maintain the borehole open to permit the explosion of a plurality of seismic blasting charges before collapsing, but being capable of slowly absorbing water and becoming water-soaked so that it disintegrates to such an extent that it ceases to be an obstruction and need not be removed from the borehole.

2. A borehole casing for geophysical prospecting, consisting of a tubular casing of a length suitable for supporting the walls of a borehole for seismic blasting, said casing being formed of partially waterproofed cardboard having a stiffness capable of withstanding the exterior pressure exerted by the walls of a borehole, being capable of suspending its own weight when lowered into a borehole, and being adapted to temporarily maintain the borehole open to permit the explosion of a plurality of seismic blasting charges before collapsing, but being capable of slowly absorbing water and becoming water-soaked so that it disintegrates to such an extent that it ceases to be an obstruction and need not be removed from the borehole.

3. A borehole casing for geophysical prospecting consisting of a plurality of connected tubular members providing a casing of a length suitable for supporting the walls of a borehole for seismic blasting, said members being formed of partially waterproofed cardboard having a stiffness capable of withstanding the exterior pressure exerted by the walls of a borehole, being capable of suspending their own weight when lowered into a bore hole, and being adapted to temporarily maintain the borehole open to permit the explosion of a plurality of seismic blasting charges before collapsing, but being capable of slowly absorbing water and becoming water-soaked so that they disintegrate to such an extent that they cease to be obstructions and need not be removed from the borehole.

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