H. D. AND F. F. KORS.

PIPE SECTION.

APPLICATION FILED FEB. 8, 1918.

1,366,694.

Patented Jan. 25, 1921.

2 SHEETS—SHEET 1.

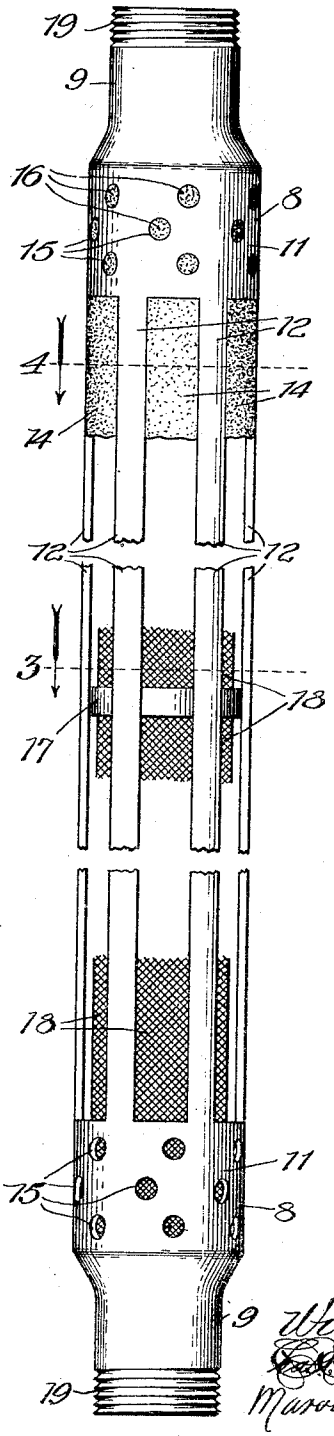


Fig. 1.



Fig. 2.

Fig. 3.

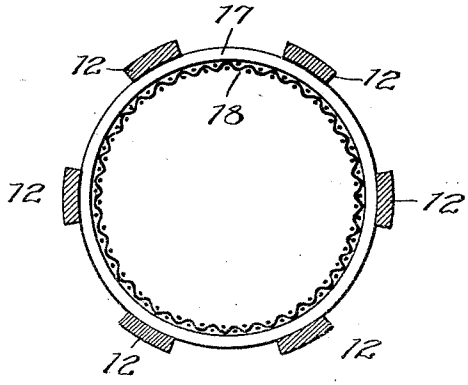
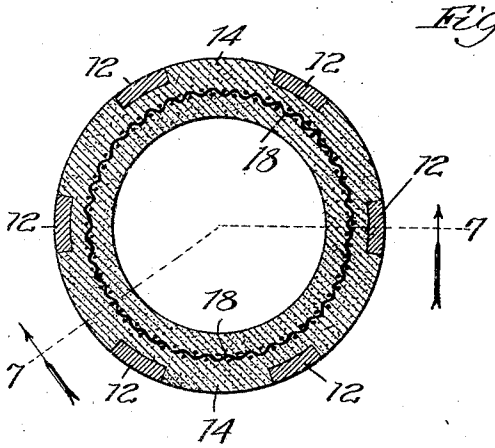


Fig. 4.



Witnesses:
Earl Gaylord.
Marvin Kahl

Inventors:
Harry D. Kors (and)
Frank F. Kors,
By Dyrenforth, Lee, Chritton & Wiles,
Attys.

H. D. AND F. F. KORS.

PIPE SECTION.

APPLICATION FILED FEB. 8, 1918.

1,366,694.

Patented Jan. 25, 1921.

2 SHEETS—SHEET 2.

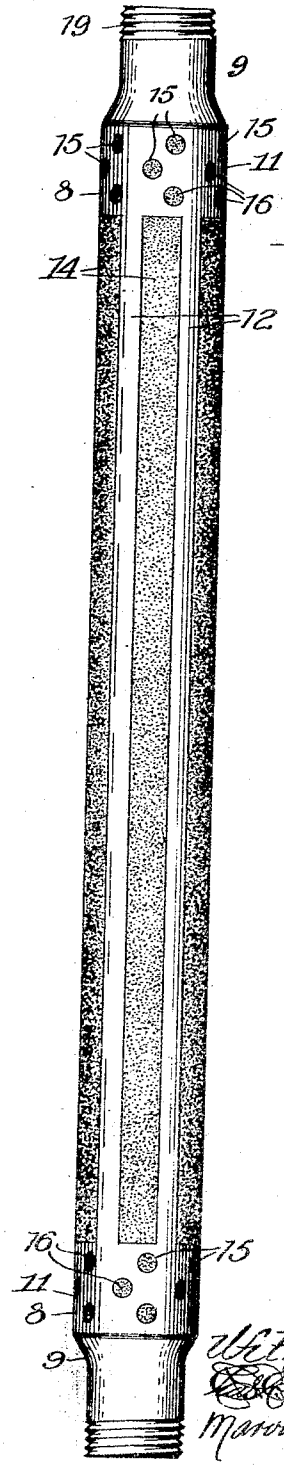


Fig. 5.

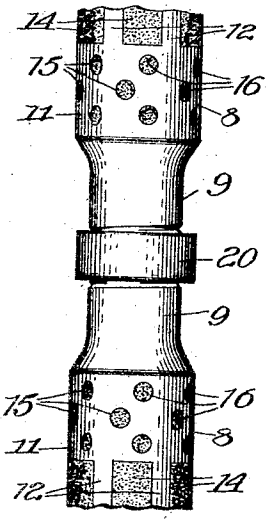


Fig. 6.

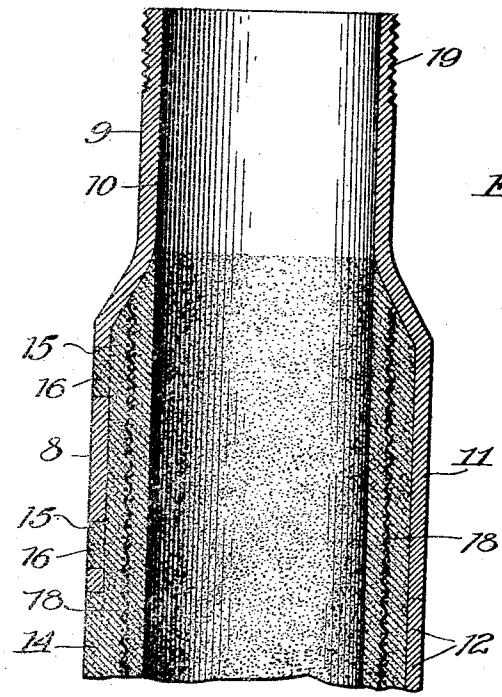


Fig. 7.

Witnesses:
E. E. Gaylord.
Marvin J. Kahl

Inventor:
Harry D. Kors
Frank F. Kors
By Dyrenforth, Lee, Chritton & Wells,
Attys.

UNITED STATES PATENT OFFICE.

HARRY D. KORS AND FRANK F. KORS, OF INDEPENDENCE, KANSAS.

PIPE-SECTION.

1,366,694. Specification of Letters Patent. Patented Jan. 25, 1921.

Application filed February 8, 1918. Serial No. 216,101.

To all whom it may concern:

Be it known that we, HARRY D. KORS and FRANK F. KORS, citizens of the United States, residing at Independence, in the county of Montgomery, and State of Kansas, have invented a new and useful Improvement in Pipe-Sections, of which the following is a specification.

Our invention relates, more particularly, to pipe sections for forming the casings of deep wells, such as gas, oil or water wells. As a preface to the following description, it may be stated that it is common practice in the art of sinking wells to provide as a lining for the wells, a casing formed of sections supplied to the well-location and connected together to form water-tight joints, as the lowering of the casing into the well progresses. It is also common practice where a well is found to be not productive or after operation becomes non-productive, to remove the casing of the well for use in another well. Thus, it is desirable that the casing be provided of such construction that it may be sunk into the well to form a water-tight conduit, through which the contents of the well may pass, and be withdrawn from the well, as for example under the conditions above stated, and in devising our improved construction, both of the above-referred-to conditions have been taken into consideration.

Casings for wells as hitherto provided, have commonly been formed of sections of metal pipe with suitable means connecting them in end-to-end relation for the purposes above stated, but such practice presents the great objection of high costs.

Our object is to provide a simple and economical construction of casing which, in connection with our more particular object, may be sunk into a well during the sinking of the latter, or after the latter has been sunk, and which may be removed therefrom if desired for application to a new location. Another object is to provide a highly desirable construction of pipe-section formed of reinforced material presenting a relatively large degree of tensile strength, and which will withstand the stresses to which it is subjected in its introduction into, and its withdrawal from, a well; and other objects as will appear from the following.

Referring to the accompanying drawings, Figure 1 is a view in side elevation of a pipe-section constructed in accordance with our invention, the structure being wholly broken away at intervals intermediate its ends and with certain parts of the portions illustrated, removed. Fig. 2 is a view in elevation, partly sectional, of a ring for connecting together the adjacent ends of the pipe-sections. Fig. 3 is an enlarged section taken at the line 3 on Fig. 1 and viewed in the direction of the arrow. Fig. 4 is an enlarged section taken at the line 4 on Fig. 1 and viewed in the direction of the arrow. Fig. 5 is a view in elevation of the completed pipe-section. Fig. 6 is a view in elevation of the two adjacent ends of alining casing-sections, showing them connected together by the ring of Fig. 2; and Fig. 7 an enlarged view in sectional elevation of one of the similar ends of the casing-section.

In constructing the casing-section in accordance with the preferred illustrated embodiment of our invention, we provide the nipples 8, which are preferably formed of steel and form the opposite ends of the finished casing-section. These nipples are of reduced internal and external diameter at their outer end portions 9 to cause the bore 10, extending therethrough, to be of less diameter than presented by their inner end portions 11. The nipples 8 are connected together by any desirable connecting medium, as for example the bars 12, preferably of steel, which extend lengthwise of the casing-section and preferably in parallel spaced relation to afford an annular series thereof, as illustrated. The bars 12 may be connected with the nipples 8 in any desirable manner, in the construction shown, the ends of these bars abutting the ends of the nipples and secured thereto as by welding.

Any desirable filler, as for example cement, may be inserted into the openings provided in the frame-work to render the wall of the casing water-tight, the filler thus provided and represented at 14, preferably extending into the enlarged portions 11 of the nipples 8 and provided of such thickness that the bore extending throughout the length of the casing will be uniformly of the diameter of the bores 10, as illustrated in Fig. 7. The portions 11 of the nipples are preferably so constructed as to provide an interlocking anchorage with the cement filler, this being accomplished preferably by aperturing the portions 11 at intervals, as represented at 15, the filler extending into these openings, as represented at 16. Where

conditions render it desirable, transverse reinforcing members may be employed, which may be in the form of rings, as for example as shown at 17 and which may be placed at any desirable intervals along the length of the casing-section, the rings 17 being shown as extending adjacent the inner sides of the bars 12 and connected therewith in any desirable manner not shown. Furthermore, it is preferred that there be associated with the reinforcing frame-work above described, relatively fine-mesh reinforcing material, as for example wire fabric, represented at 18, and which is provided in the form of a cylinder extending substantially the full length of the pipe-section and into the portions 11 of the nipples and as shown lying adjacent the inner surface of the reinforcing frame-work, as more particularly illustrated in Fig. 3.

In the formation of the casing section, the filler would be molded about the reinforcing members thereof preferably to the position as is shown and above explained, by the use of any suitable means, as by a mold having a collapsible core, as will be readily understood by those skilled in the art.

The outer ends of the nipples 8 are preferably externally screw-threaded, as represented at 19, at which portions they are adapted to screw into a connecting ring 20, which serves as means for tightly connecting together the adjacent ends of alining casing-sections, as represented in Fig. 6.

It will be understood from the foregoing that by constructing a casing-section in accordance with our invention, the minimum amount of metal is required, a casing formed of the sections is rendered watertight, and the provision of the tensile elements 12 connected with the tensile elements 8 at the ends of the casing-section, affords to the structure sufficient strength to permit of the withdrawal of the casing from a well.

While we have illustrated and described a particular construction embodying our invention, we do not wish to be understood as intending to limit it thereto, as the same may be variously modified and altered without departing from the spirit of our invention, it being our intention to claim our invention as fully and completely as the prior state of the art will permit.

What we claim as new and desire to secure by Letters Patent is—

1. A pipe section formed at its ends with hollow members having their outer ends of reduced diameter, means connected with said members and forming an open-work structure, and a filler substance filling the spaces in said open-work structure and extending into those portions of said members which are of larger diameter, with the inner surface of the mass formed of said filler substance extending substantially flush with the inner surface of those portions of said members which are of smaller diameter.

2. A pipe-section formed at its ends with hollow members having their outer ends of reduced diameter, a series of bars connected with said members and forming an open-work structure, and a filler substance filling the spaces in said open-work structure and extending into those portions of said members which are of larger diameter, with the inner surface of the mass formed of said filler material extending substantially flush with the inner surfaces of those portions of said members which are of smaller diameter.

3. A pipe section formed at its ends with hollow members having their outer ends of reduced internal diameter, and a body portion interposed between said members and extending at its ends into those portions of said members which are of larger internal diameter, with the inner surface of said body portion extending substantially flush with the inner surfaces of those portions of said members which are of smaller diameter.

4. A pipe-section formed at its ends with hollow members having their outer ends of reduced internal diameter and containing recesses in their inner ends, and a body portion interposed between said members and extending at its ends into those portions of said members which are of greater internal diameter and interlocking with said members at said recesses, the inner surface of said body portion extending substantially flush with the inner surface of those portions of said members which are of smaller diameter.

5. A pipe-section formed at its ends with hollow members in the form of nipples with their outer ends of reduced internal diameter and provided with threads, an annular series of bars spaced apart and extending lengthwise of said section and rigidly connected at their opposite ends with those portions of said nipples which are of larger diameter, and a body of filler located between said nipples and extending into the spaces between said bars and extending into those portions of said nipples which are of greater diameter, the inner surface of the cement portion of the section extending substantially flush with the inner surface of those portions of the nipples which are of smaller diameter.

6. A pipe section formed at its ends with means adapting it to be connected with a similar section, tension elements extending between said means and forming an open-work structure and operatively engaging said means to cause forces tending to move said means in a direction away each other to be resisted by said elements, and a filler substance extending between and underneath said tension elements, with the outer

surface of said substance flush with the outer surface of said tension elements.

7. A pipe section formed at its ends with means adapting it to be connected with a similar section, a plurality of bars extending lengthwise of the section and between said means and forming an open-work structure, said bars operatively engaging said means to cause forces tending to move said means in a direction away from each other to be resisted by said bars, and a filler substance extending between and underneath said bars with the outer surface of said substance flush with the outer surface of said bars.

8. A pipe section formed at its ends with hollow members with means adapting them to be connected with similar sections, tension elements extending between said hollow members and forming an open-work structure and operatively engaging said hollow members to cause forces tending to move said hollow members in a direction away from each other to be resisted by said elements, and a filler substance extending between and underneath said tension elements, with the outer surface of said substance flush with the outer surface of said elements.

9. A pipe section formed at its ends with hollow members, tension elements extending from one to the other of said hollow members and forming an open-work structure, said elements operatively engaging said hollow members to cause forces tending to move the latter in a direction away from each other to be resisted by said elements, reinforcing fabric, a filler substance extending between and underneath said tension elements and inclosing said fabric, with the outer surface of said substance flush with the outer surface of said tension elements, the whole constituting a unitary structure, and means independent of said elements, adapting said section to be connected at its ends with similar sections.

10. A pipe section formed at its ends with hollow members, tension elements extending from one to the other of said hollow members and forming an open-work structure, said elements operatively engaging said hollow members to cause forces tending to move the latter in a direction away from each other to be resisted by said elements, a reinforcing fabric, a reinforcing ring extending transversely of said pipe section, a filler substance extending between and underneath said tension elements and inclosing said ring and fabric, with the outer surface of said substance flush with the outer surface of said tension elements, the whole constituting a unitary structure, and means independent of said elements adapting said section to be connected at its ends with similar sections.

11. A pipe section formed at its ends with hollow members, tension elements extending from one to the other of said hollow members and forming an open-work structure, said elements operatively engaging said hollow members to cause forces tending to move the latter in a direction away from each other to be resisted by said elements, a filler substance extending between and underneath said tension elements, with the outer surface of said substance flush with the outer surface of said elements, the whole constituting a unitary structure, and means independent of said elements adapting said section to be connected at its ends with similar sections.

12. A pipe section formed at its ends with hollow members, tension elements extending from one to the other of said hollow members and rigidly connected therewith and forming an open-work structure, said elements operatively engaging said hollow members to cause forces tending to move the latter in a direction away from each other to be resisted by said elements, a filler substance extending between and underneath said tension elements, with the outer surface of said substance flush with the outer surface of said tension elements, the whole constituting a unitary structure, and means independent of said elements adapting said section to be connected at its ends with similar sections.

HARRY D. KORS.
FRANK F. KORS.