(No Model.)

# R. L. HARRIS.

## TUBE FOR CEMENT FOUNDATIONS OR UNDERGROUND STRUCTURES.

No. 528,368. Patented Oct. 30, 1894.

Fig. 2.

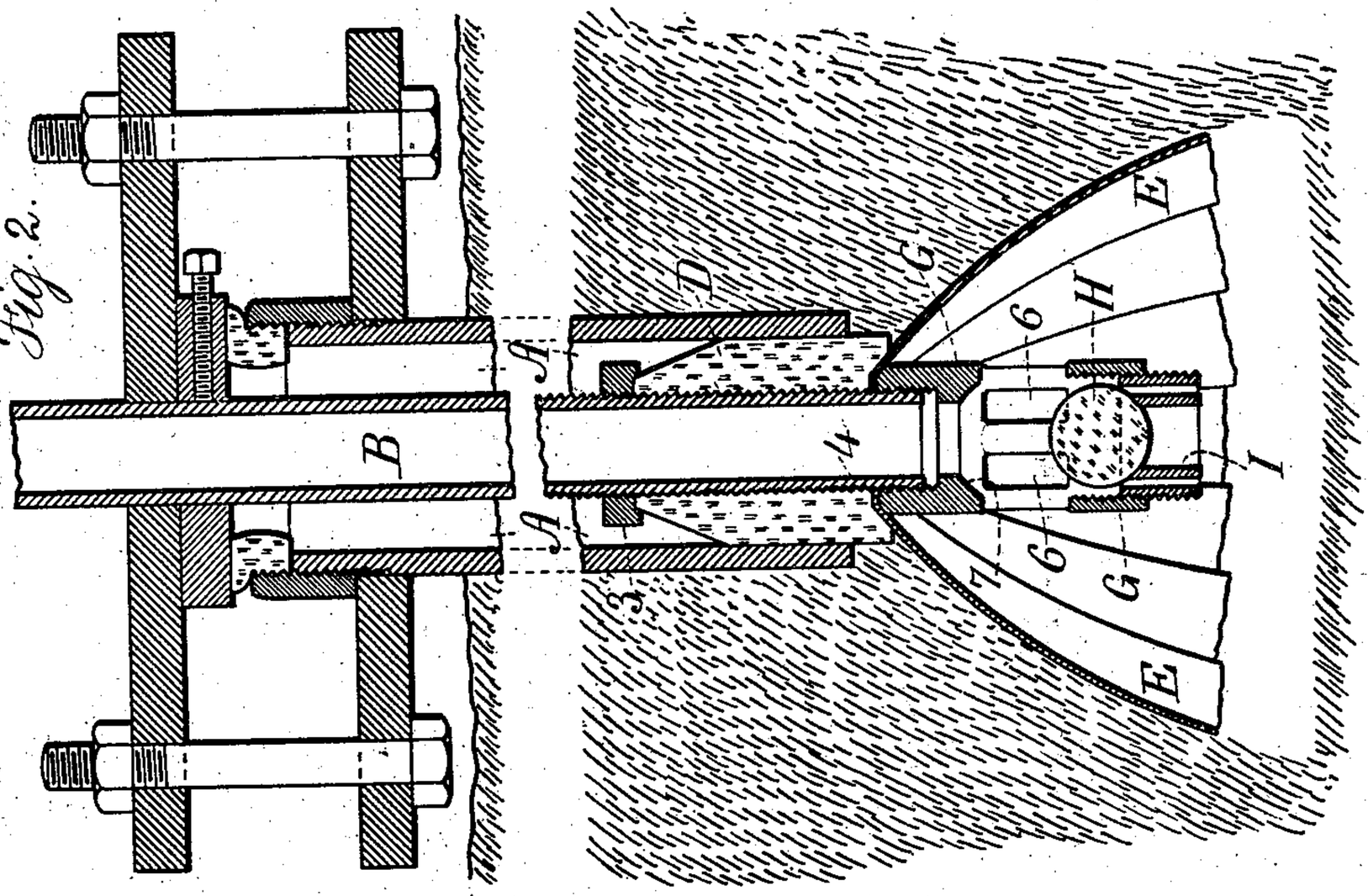
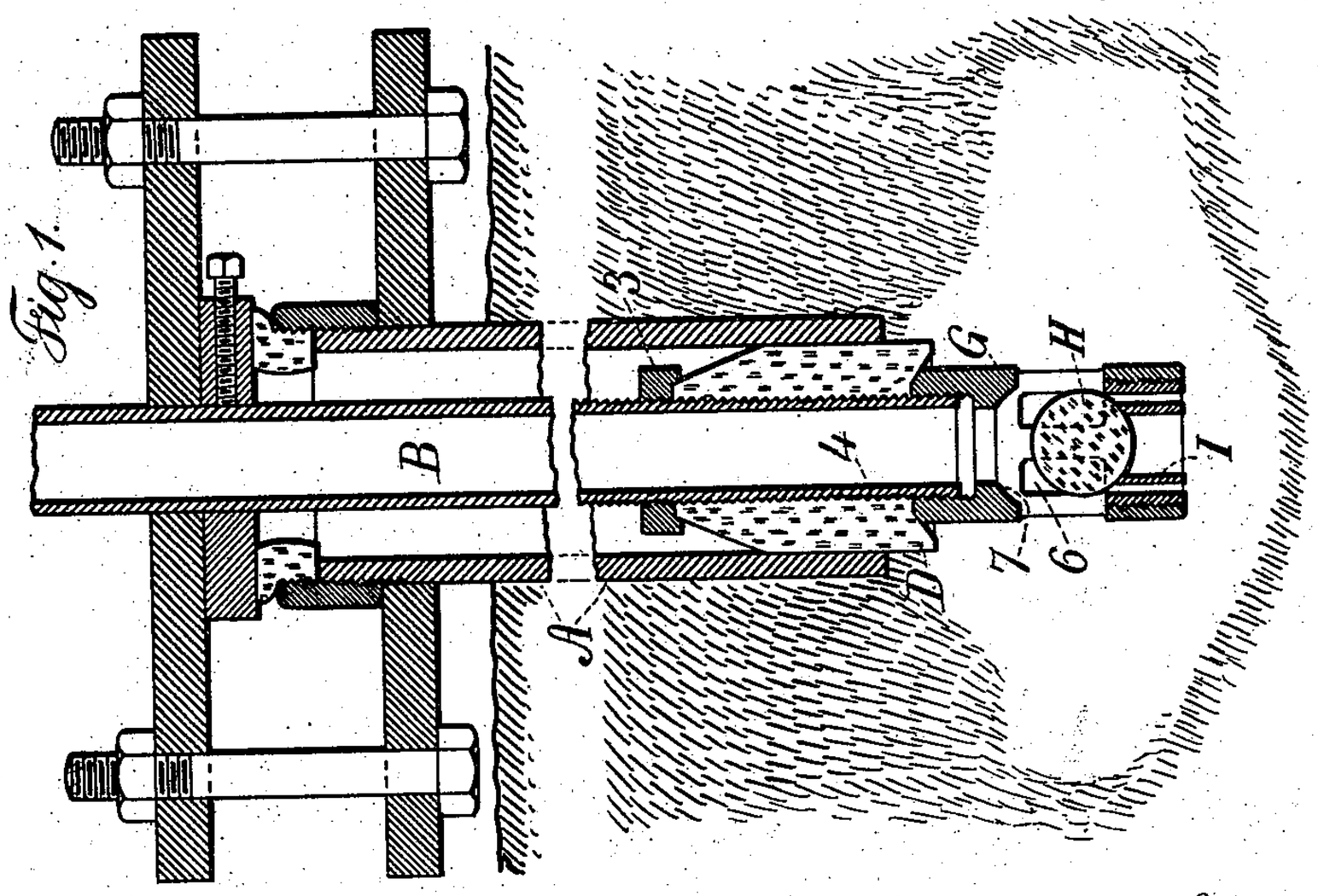



Fig. 1.




Witnesses:
J. Stair
Chas. A. Smith

Inventor:
Robert L. Harris
per Lemuel W. Serrell Atty

# UNITED STATES PATENT OFFICE.

ROBERT L. HARRIS, OF NEW YORK, N. Y.

## TUBE FOR CEMENT FOUNDATIONS OR UNDERGROUND STRUCTURES.

SPECIFICATION forming part of Letters Patent No. 528,268, dated October 30, 1894.

Application filed February 12, 1894. Serial No. 499,870. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT L. HARRIS, a citizen of the United States, residing in the city, county, and State of New York, have invented an Improvement in Tubes for Cement Foundations or Underground Structures, of which the following is a specification.

In Letters Patent No. 464,771, granted to me December 8, 1891, a tube is represented as adapted to being forced down into the earth and to receive within it a secondary tube through which water may be forced to establish a circulation between one tube and a distant tube or tubes and also through which cementing material may be forced in forming the underground structure or foundation, and a rubber packing between the outer and the secondary tube is also represented and an annular flap to lessen the tendency of the water or cement to pass up immediately around the outer pipe,

In my present invention I have combined with the inlet pipe for water or cementing material a combined valve and deflector together with a support for the valve and deflector, whereby the same can be raised or lowered to the desired point and will either direct the water or cement laterally and approximately horizontally or allow such water or cement to pass downwardly below the pipe, and this deflector acts as a valve to prevent any cementing material flowing upwardly into the inlet pipe when such cementing material is forced down through some other pipe into the subsoil where the foundation or other cement structure is being made.

In the drawings, Figure 1 is a vertical section representing the tubes made use of by me without the annular flap and with the deflector in a position to direct the water or cementing material laterally. Fig. 2 is a similar view with the flap in position and the deflecting valve lowered so that the material introduced through the pipe is free to pass down as the same may be directed.

The outer tube A is preferably sunk to the desired depth through the earth, sand or other material, and the rubber plug D which surrounds the lower part of the secondary tube B, is of a size to fit into the tube A, and there is a nut 3 by which the rubber plug D can be compressed endwise and spread laterally to a greater or less extent, so as to fit sufficiently tight within said tube A; and it is advantageous to screw-thread the lower portion 4 of the tube B so as to screw upon the same the plug D and the nut 3 and also to screw upon the lower end of the tube B the deflector case G which is similar to a tubular coupling with vertical slots 6 therein which give a free lateral escape to water or cementing material forced down through the tube B; and in this case G there is a seat 7 above the valve and deflector H, and below such valve and deflector is a support I, preferably in the form of a ring, that is screwed into the lower end of the case G and can be adjusted vertically to raise the valve and deflector H into near proximity to the seat 7 or to lower such valve and deflector to or below the lower ends of the slots 6, and the annular flap E is similar to that in the aforesaid patent and is introduced between the upper end of the deflector case G and the rubber plug D.

When the annular flap E is not attached in place and the ring support I is screwed to raise the deflector valve H into near proximity to the seat 7, the water or the cement which may be introduced through the pipe B is deflected outwardly and more nearly horizontal so as to be spread, and when water is used to wash the loose materials and form channels, as in Patent No. 464,771, a space is obtained between one pipe and another for the insertion of the cementing material, or where cementing material is to be directed horizontally or nearly so between loose stones or rubble, this deflector H is raised or lowered to a greater or less extent so as to direct the materials as they issue from the lower end of the pipe B.

If the cementing materials are to be forced downwardly or beyond the lower end of the pipe B, the ring support I is unscrewed sufficiently to allow the deflector valve H to descend toward or below the lower ends of the slots 6, so that the water or cementing materials that may be forced down the pipe B receive a downward direction, and the annular flap E is advantageously applied around and above the case G to prevent the materials passing up around the pipe.

When the pipe B is not used in forcing down water or cementing material, the ball H

which is preferably lighter than the water will rise or be forced up against the seat 7 by any upflowing current or pressure acting through the opening of the ring or support, so as to prevent water flowing up through the pipe B and to prevent cementing material passing into the pipe B when such cementing material may be forced down some adjacent or more distant pipe. I find that this valve is convenient for preventing the upflow of cementing material, but in cases where it is desired to use the pipe B for an upflow of water it is not necessary to withdraw the pipe B and take out the valve H, because the same may be held down in any suitable manner such as by a small rod introduced through the pipe B which will rest upon the valve without materially obstructing the upward flow of the water; and I remark that the ring or support for the valve may have several openings through the ring in addition to or in place of the central opening.

I claim as my invention—

1. In an apparatus for making foundations or inclosures by cementing material, the pipe B, in combination with the deflector case screwed upon the lower end thereof and having lateral openings, the deflector valve within the case and an adjustable ring support below the valve, substantially as set forth.

2. The combination in an apparatus for making foundations or inclosures by cementing material, of the pipe B extending to the surface of the earth, the deflector case secured to the end of the pipe and provided with lateral openings, a valve and deflector within the case, a ring support screwed into the end of the case, and an annular flap connected at the upper end of the case, substantially as set forth.

3. The combination in an apparatus for making foundations or inclosures by cementing material, of the pipe A and the pipe B within the same and extending to the surface of the earth, the deflector case secured to the end of the pipe and provided with lateral openings, a valve and deflector within the case, a support in the end of the case, an annular flap connected at the upper end of the case, and a rubber plug around the pipe B and within the pipe A, substantially as set forth.

4. In an apparatus for making foundations or inclosures by cementing materials, the pipe B, in combination with the deflector case screwed upon the lower end thereof and having lateral openings, the deflector valve within the case, and a support below the valve, substantially as set forth.

5. In an apparatus for making foundations or inclosures by cementing material, pipes through which water or cementing material may be forced down into the earth, and a valve at the lower end of each pipe to prevent the cementing material forced down through one pipe rising into either of the other pipes, substantially as set forth.

Signed by me this 6th day of February, 1894.

ROBERT L. HARRIS.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.