

No. 612,175.

Patented Oct. 11, 1898.

F. A. PHELPS, JR.  
MULTIPLE PIPE COIL.

(Application filed Jan. 18, 1898.)

(No Model.)

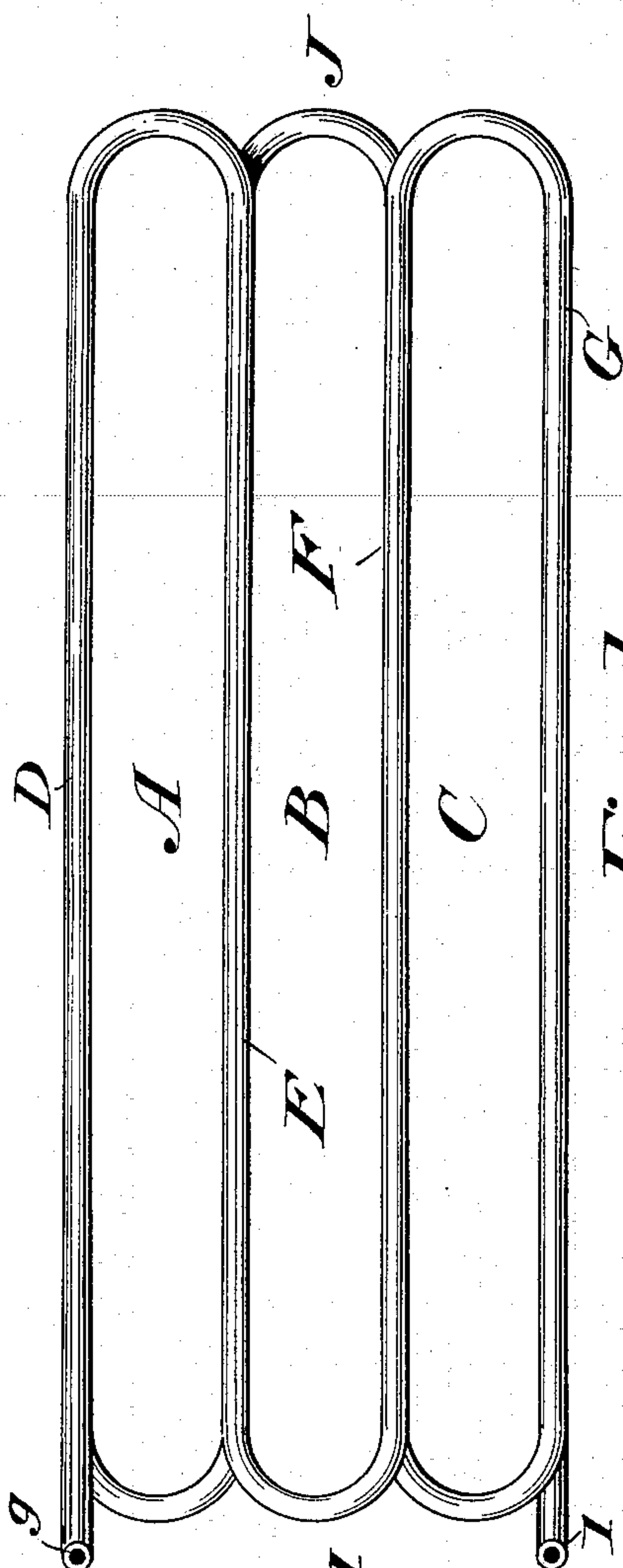


Fig. 1.

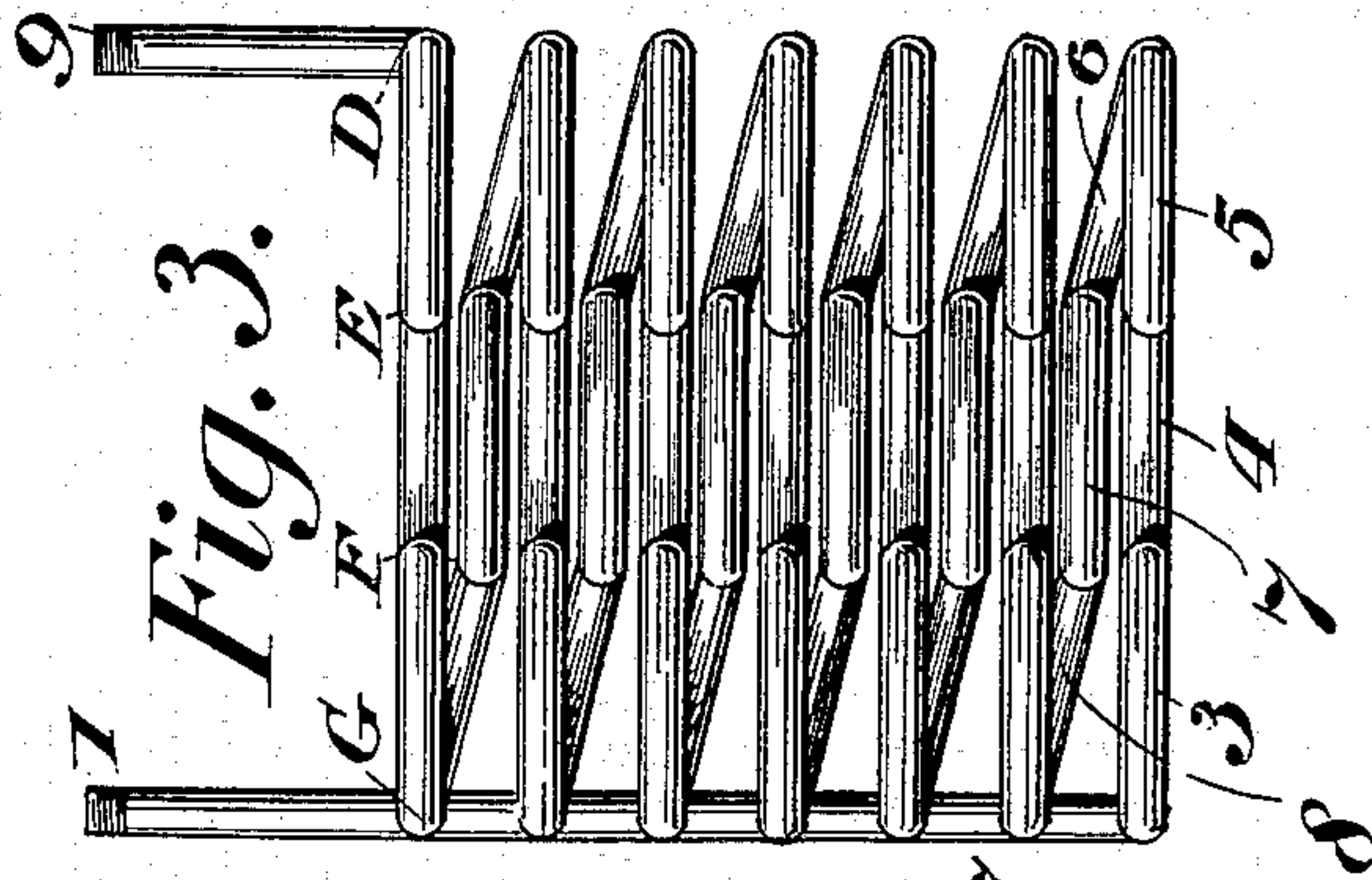


Fig. 3.

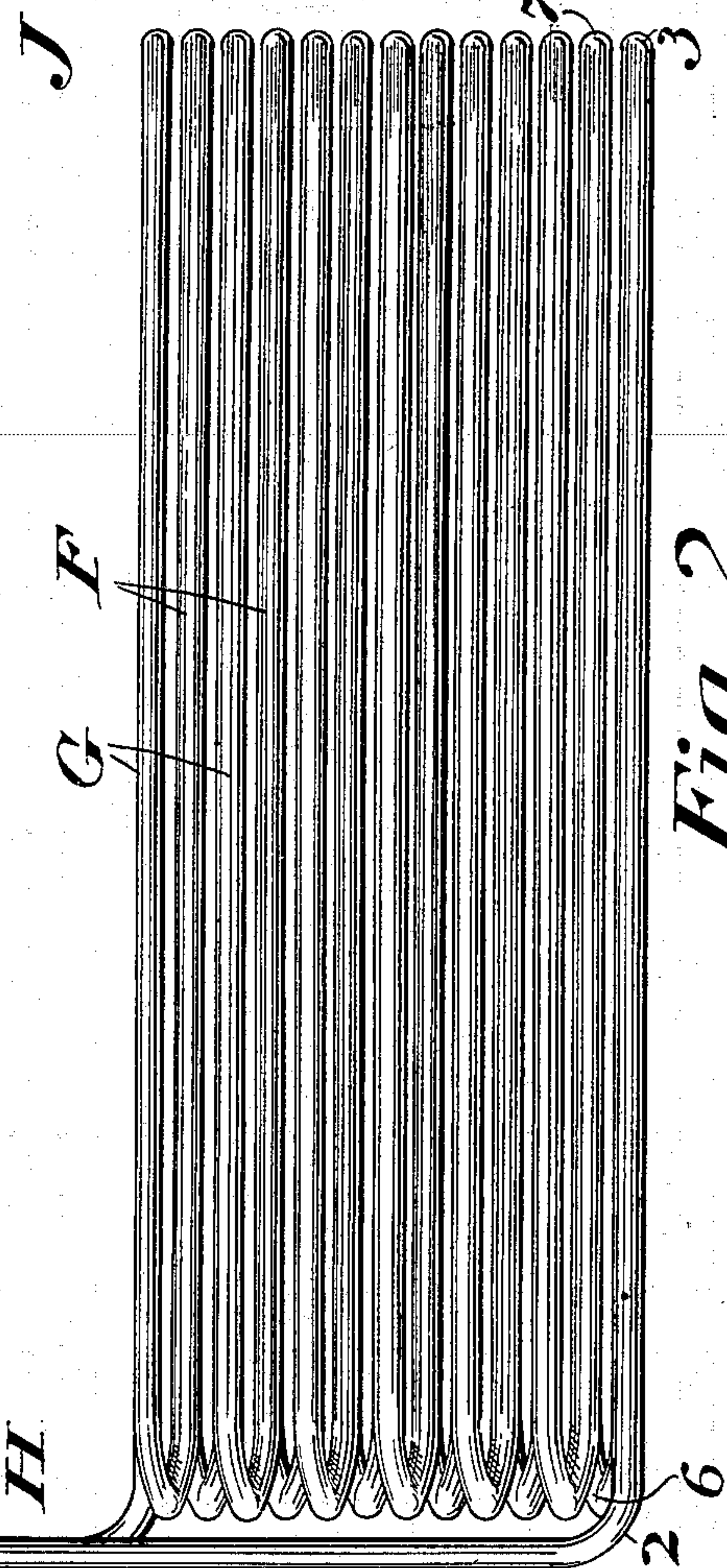


Fig. 2.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## MULTIPLE PIPE-COIL.

SPECIFICATION forming part of Letters Patent No. 612,175, dated October 11, 1898.

Application filed January 18, 1898. Serial No. 667,104. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK A. PHELPS, Jr., of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Multiple Pipe-Coil, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to pipe-coils such as are suited for the freezing-coil of a refrigerating system or for kindred purposes.

The object of my invention is to provide a coil adapted to inclose a plurality of separated chambers in which ice-making cans may be placed and having the lines of the coil so disposed that a uniform heat-absorbing efficiency will be obtained for each portion of the coil.

A further object of my invention is to provide a coil composed of a single pipe, thus avoiding a multiplicity of joints, fittings, &c.

These objects I attain by the means to be hereinafter described.

Referring to the drawings, Figures 1, 2, and 3 represent, respectively, plan, side, and end views of a refrigerating-coil embodying the features of my invention.

The coil which I have shown is adapted for submersion in brine or similar liquid and incloses the three freezing-chambers A, B, and C, in which may be placed the vessels containing the water to be frozen. These three chambers are inclosed by the walls D, E, F, and G, the two outer of which, D and G, form the boundary of but one chamber, while the two inner walls E and F each form the boundaries for two chambers. As hitherto constructed the outer walls D and G of refrigerating-coils expose substantially the same amount of cooling-surface as is exposed by their inner walls E and F. This is obviously disadvantageous, for the inner walls absorb heat from twice as many ice-chambers. A reference to Fig. 3 will show that in my improved coil the inner walls E and F have nearly twice the number of pipe members as the outer walls D and G. This is one of the most important advantages of my improved invention. I have represented one end of my

coil by the letter H and the other end by the letter J.

My improved multiple coil is formed of a single piece of pipe, which is wound in the following manner: The end 1 of the pipe passes down vertically to the bottom of the coil and makes a quarter-turn at 2. Thence it extends horizontally to the J end of the coil, forming one of the members of the wall G. At the J end of the coil it makes a half-turn 3 and returns to the H end of the coil, thus forming the lower member of the wall F. Thence by a half-turn 4 it returns to the J end of the coil, forming the lower member of the wall E. Thence by taking a half-turn 5 it returns once more to the H end of the coil, forming the lower member of the wall D. At this point it takes an upwardly-inclined half-turn 6 and returns to the J side of the coil, forming the second member of the wall E. Thence after taking half-turn 7 and returning to the H end of the coil it forms the second member of the wall F. Thence by an upwardly-inclined half-turn 8 it becomes the second member of the wall G. It is not believed to be necessary to follow the detail of the winding any further, for the same principle is followed throughout, as will be readily noted, until the other end of the pipe is reached at 9. It will be seen by this arrangement I am enabled to provide a coil formed of a single continuous piece of pipe which is adapted to surround separate freezing-chambers and in which the cooling-walls which must absorb substantially double the amount of heat are formed of substantially double the number of individual members. Besides this advantage, it is clear that my improved coil, being composed of a single continuous pipe member, is much lighter and is less liable to leak than the built-up coils now used for this and kindred purposes.

I do not desire to limit myself to the exact details herein shown and described or to the use of my improved coil for the exact purpose set forth. It is obvious that in view of what I have shown and described it would be a matter of no difficulty to provide a coil which will surround a smaller or larger num-



ber of freezing-chambers than the one which I have shown.

Having thus described my invention, what I claim, and desire to protect by Letters Patent, is—

1. A coil having vertical walls of pipe inclosing a plurality of separated chambers, each pipe of an outer wall being connected to the neighboring wall by an inclined half-turn at one end and a horizontal half-turn at the other end.

2. A single piece of pipe wound so as to have a plurality of vertical walls of pipe, each wall being connected to its neighbor by end loops, the outer walls being composed of about half as many individual members as the remaining walls.

3. A single piece of pipe wound into a coil having a pair of parallel outer walls, and inner walls between the same, each wall being connected to the adjacent walls by end loops, the said inner walls being composed of substantially double the number of individual members which comprise the outer walls.

4. A coil comprising a single piece of pipe wound to form a plurality of horizontal layers, each layer being composed of a plurality of

parallel lines connected by end loops, every alternate layer being composed of two less individual lines than its neighbors and each layer being connected to its neighbors by an inclined half-turn.

5. A coil comprising a single piece of pipe inclosing separated chambers and composed of horizontal layers, that portion of the coil inclosing the outer portion of each outer chamber being composed of substantially half as many layers as the balance of the coil.

6. A refrigerating-coil composed of a single piece of pipe wound substantially in the following manner, viz., from its end in a vertical line, thence through a quarter-turn, thence horizontally, thence through a half-turn, thence horizontally in a reverse direction, the last operation being repeated as often as desired, thence by an upwardly-inclined half-turn, thence horizontally, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

FREDERICK A. PHELPS, JR.

Witnesses:

MYRTLE E. SHARPE,  
RICHARD EYRE.