

(No Model.)

3 Sheets—Sheet 1.

W. M. BROWN.

DEVICE FOR HEATING COILS AND PIPES BY GAS.

No. 377,015.

Patented Jan. 31, 1888.

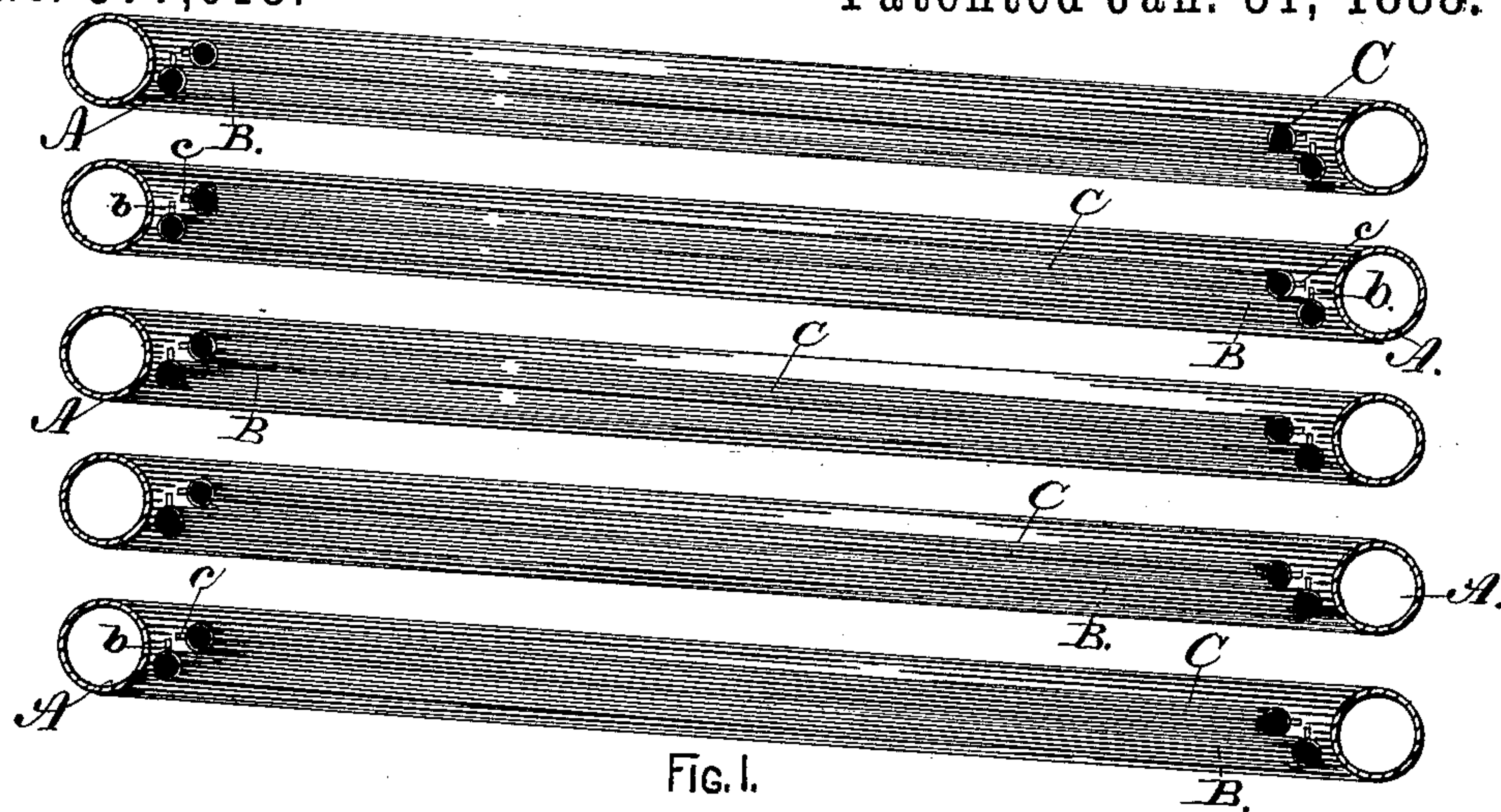


FIG. 1.

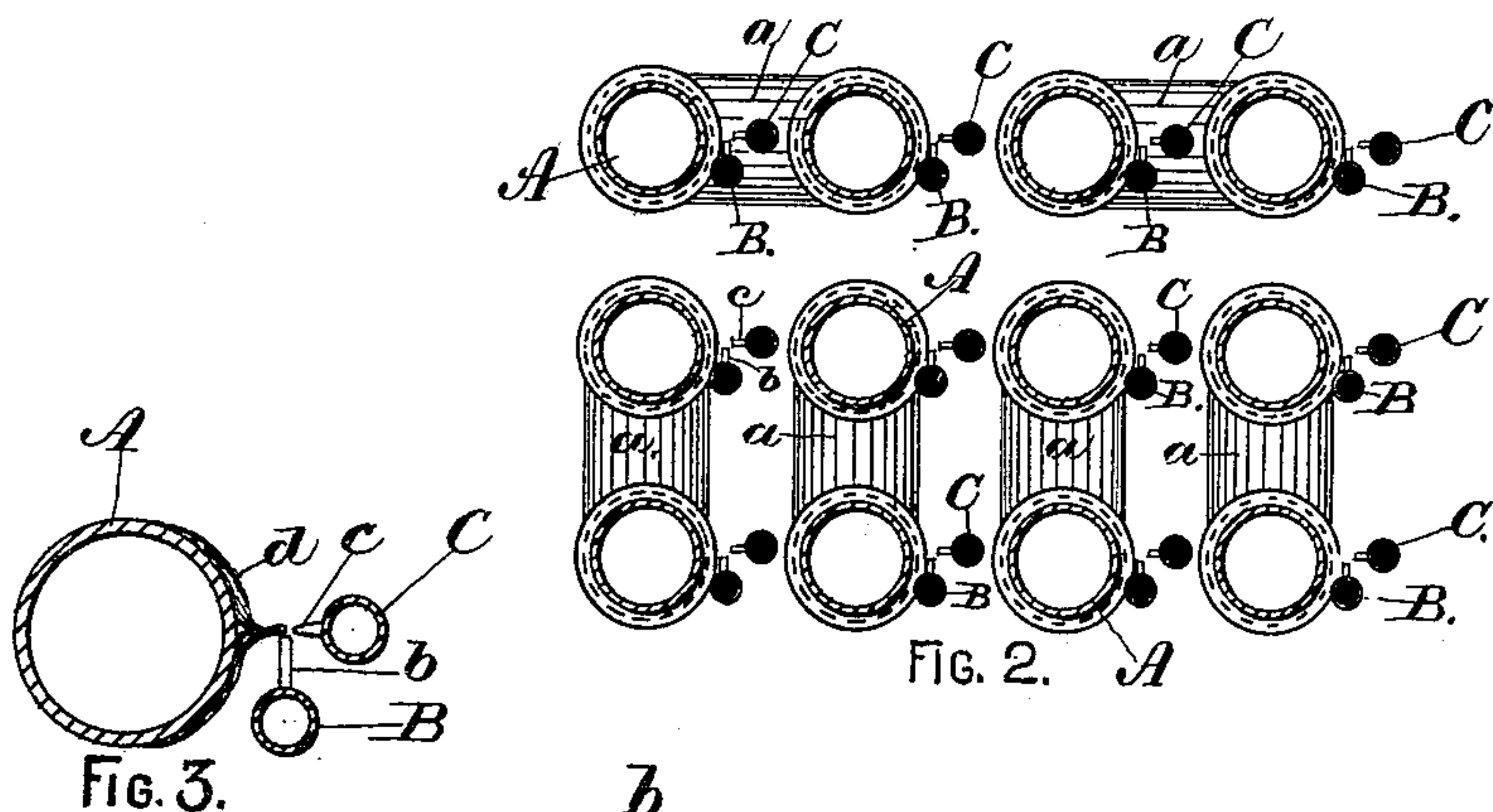


FIG. 2.

FIG. 3.

FIG. 5.

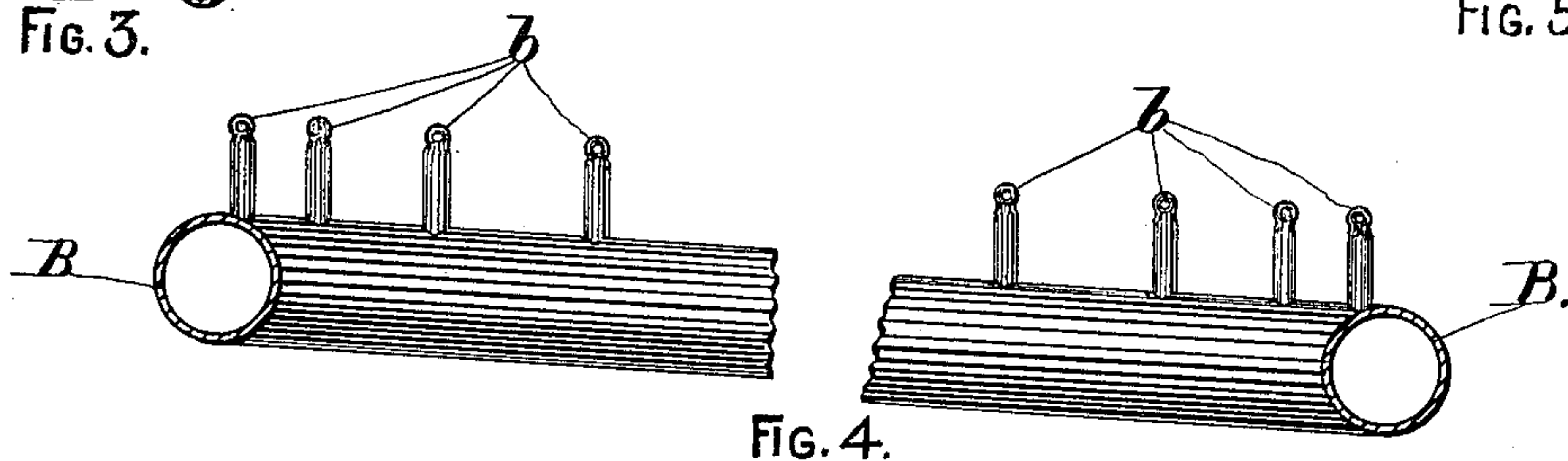


FIG. 4.

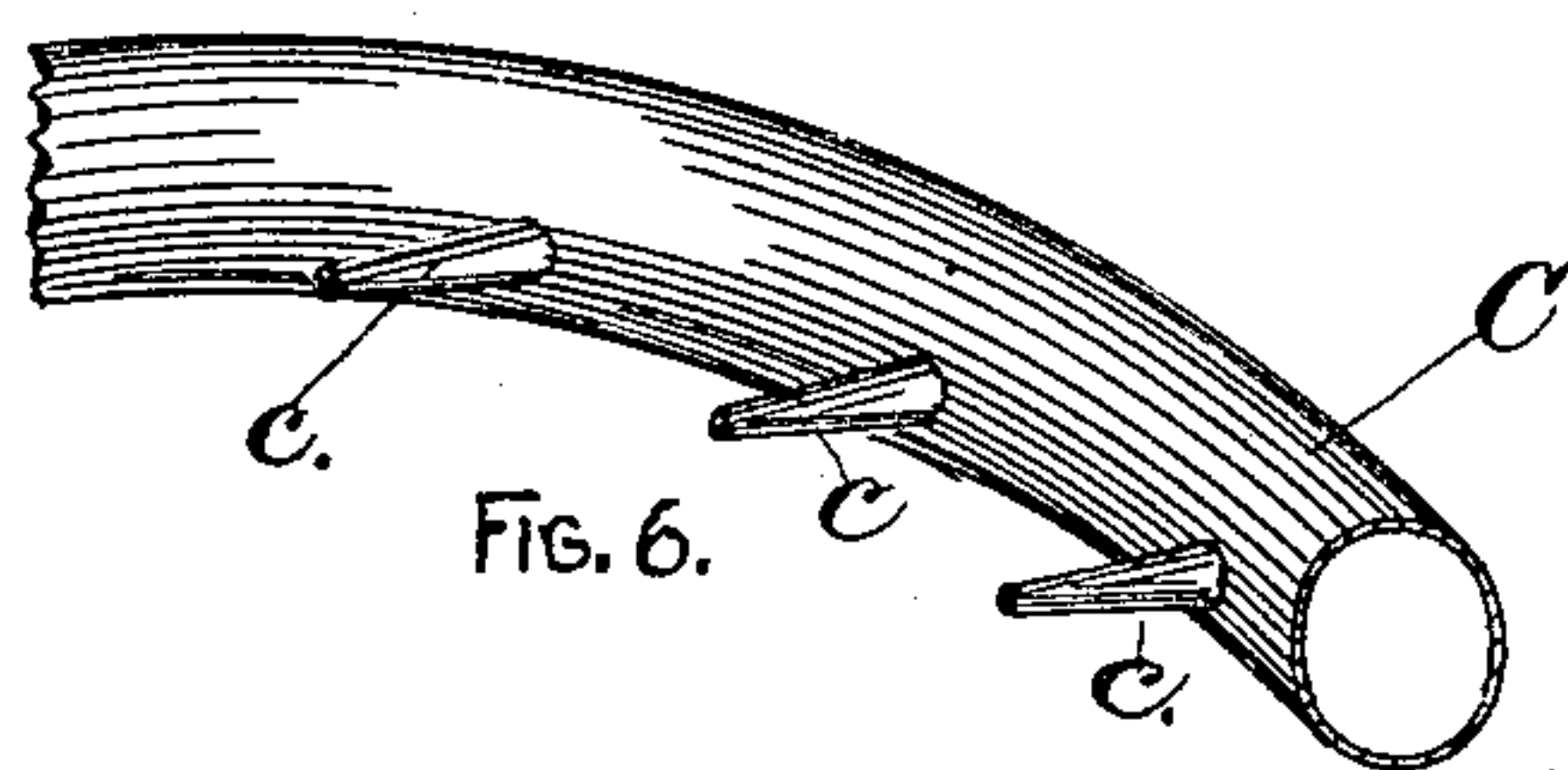


FIG. 6.

Witnesses:

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S. B. Brewer.

Inventor:

Walter M. Brown.

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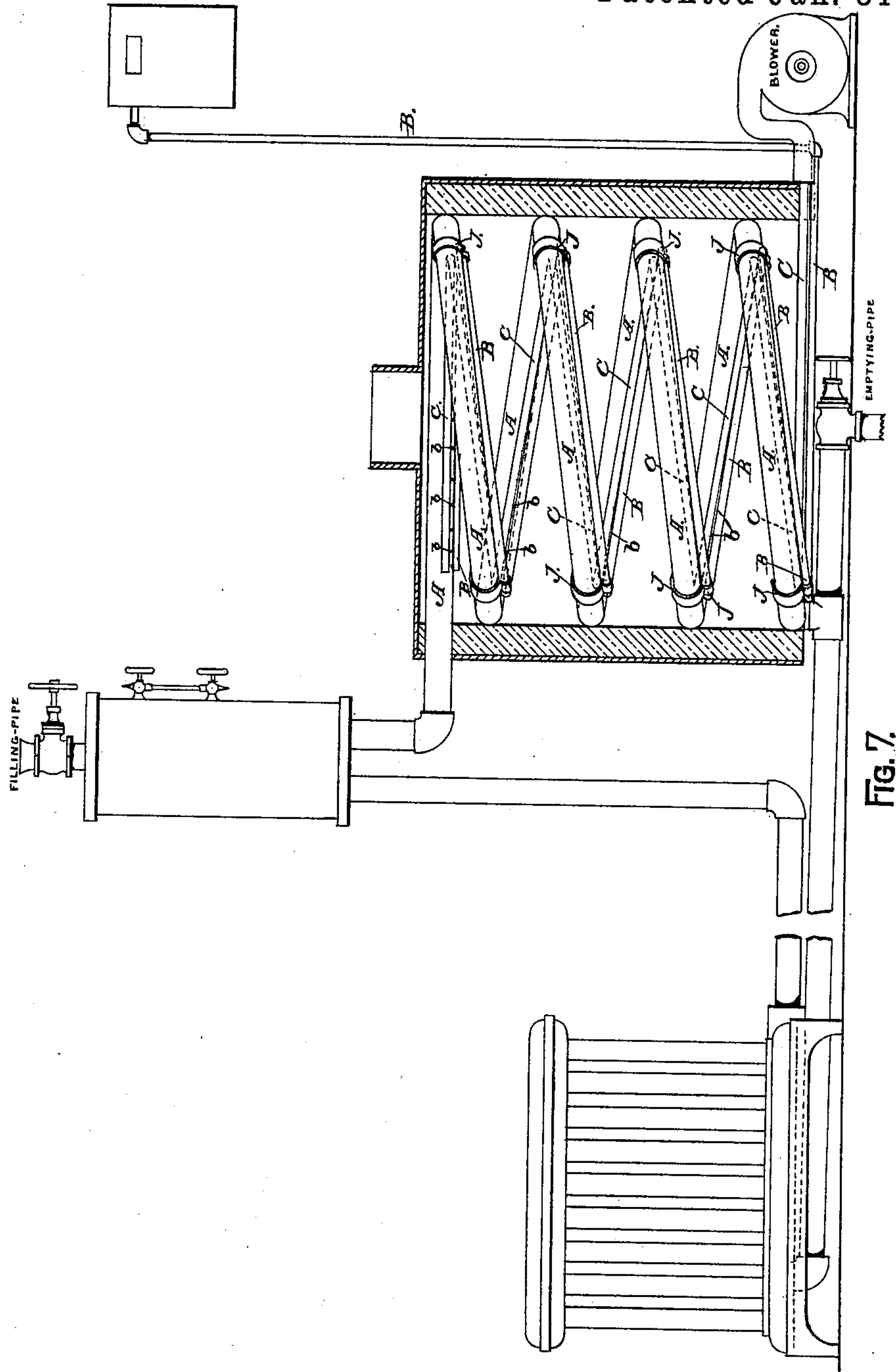


FIG. 7.

WITNESSES:

S. B. Brewer.
H. V. Scattergood.

INVENTOR:

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(No Model.)

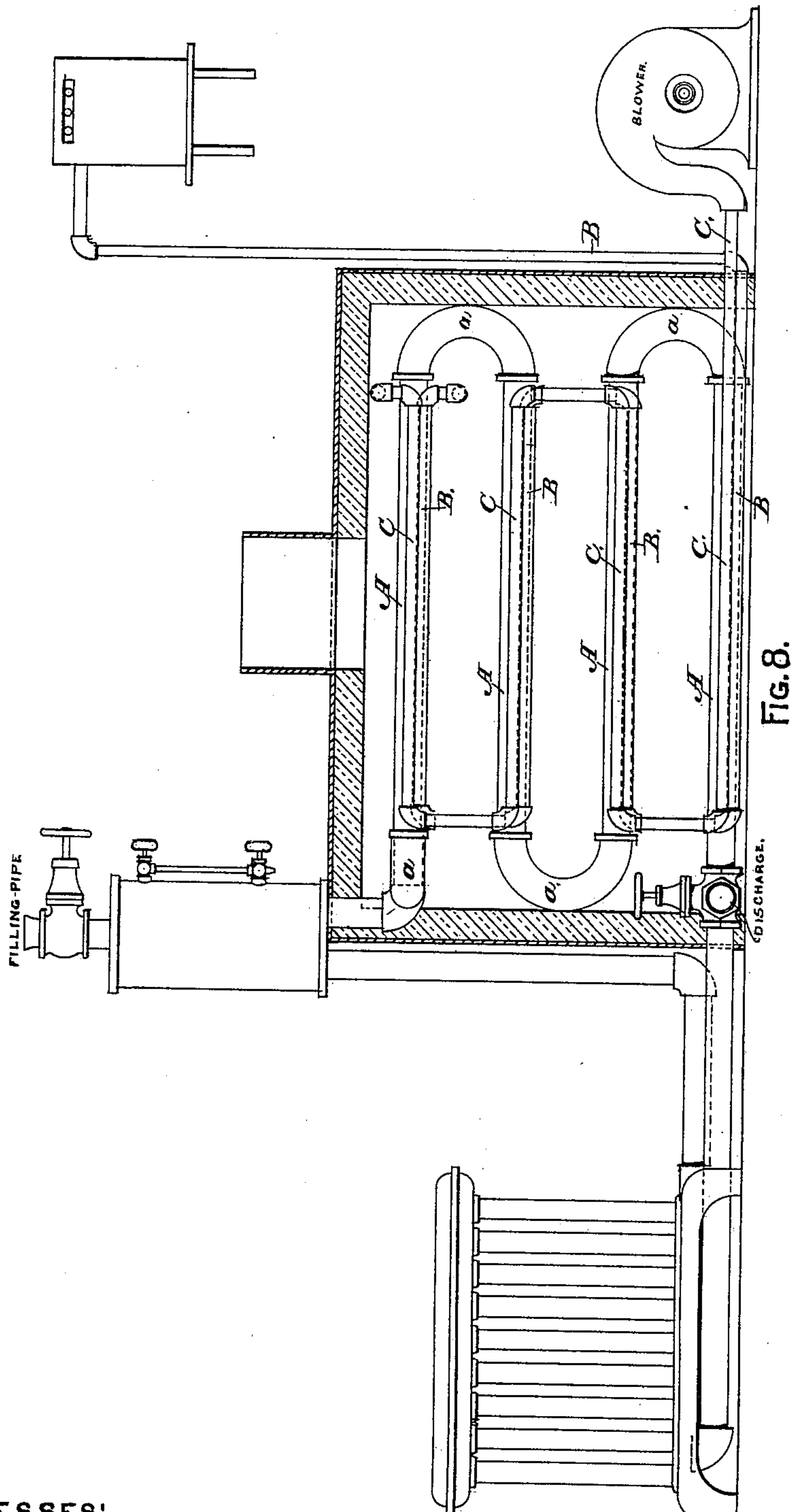
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WITNESSES:

S. B. Brewer.
H. V. Scattergood.

INVENTOR:

Walter M. Brown.

UNITED STATES PATENT OFFICE.

WALTER M. BROWN, OF ALBANY, NEW YORK.

DEVICE FOR HEATING COILS AND PIPES BY GAS.

SPECIFICATION forming part of Letters Patent No. 377,015, dated January 31, 1888.

Application filed February 18, 1887. Serial No. 228,027. (No model.)

To all whom it may concern:

Be it known that I, WALTER M. BROWN, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented new and useful Improvements in Devices for Heating Coils and Pipes by the Use of Gas or Inflammable Vapor as a Fuel; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to heat the pipes of a heating-coil or system of heating-pipes and their contents by the use of gas or inflammable vapor as a fuel, the flame of the burning gas or vapor being caused to impinge upon the surface of said heating-pipes and to heat their contents by directing a current of air or steam upon or into the flame of the burning gas or vapor. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of a circular heating-coil, showing an open coil, together with a gas-pipe coil and an air, steam, or vapor coil. Fig. 2 is a transverse section of a system of heating-pipes, commonly called a "flat coil," showing accompanying gas-pipe coil at B and accompanying air or steam coil at C. *a* shows the return-bends of the heating-coil. Fig. 3 is an enlarged view of a cross-section of one of the pipes of a coil or system of heating-pipes, with accompanying pipes B and C, showing the flame of the burning gas or inflammable vapor, *d*, burning at the burner *b*, said flame *d* being caused to impinge upon the pipe A by the current of air or steam forced through the pipe C and out of the tip *c*. Fig. 4 is an enlarged view of a broken section of the gas-pipe B, showing the arrangement of the burners *b* more in detail. Fig. 5 is an enlarged transverse section of the gas-pipe B, showing a burner, *b*, having an opening, *e*, for the admittance of air into the gas or vapor before it is ignited, forming what is known as a "Bunsen" burner. Fig. 6 is an enlarged perspective view of a portion of the air or steam pipe C, used to convey air or steam, with adjunct tips *c*, whereat to discharge the contents of said pipe C upon or into the flame

of the burning gas or inflammable vapor as it burns from the burners *b* of the pipe B. Fig. 7 shows a spiral coil with its gas-pipe coil and air-pipe coil, showing the apparatus in complete operative construction. Fig. 8 shows a flat coil with its gas-pipe coil and air-pipe coil, showing the apparatus in complete operative construction.

Similar letters refer to similar parts throughout the several views.

To enable others skilled in the art to which my invention appertains to make and use the same, I make the following detailed description of my invention.

A shows the pipes of a heating-coil or system of heating-pipes; B, the gas-pipe coil or system of gas-pipes having adjunct burners *b*, whereat to burn the gas or inflammable vapor conveyed by said pipes B, and C a coil of pipe or system of pipes having adjunct tips *c*, whereat to discharge the air or steam conveyed through the pipes C upon or into the flame of the burning gas or inflammable vapor burning at the burners *b*.

The heating-coil or system of heating-pipes may be constructed as shown in Fig. 1, each coil of the pipe thereof lying at any desired distance from the other; or it may be constructed so as to form a close coil, each pipe of the coil lying close to or against the others. I preferably construct it as shown in Fig. 1. When a flat coil or system of heating-pipes is used, a transverse section of which is shown in Fig. 2, the pipes composing it are preferably set sufficiently far apart to leave room for placing the gas-pipe B and the air or steam pipe C in position to cause the air or steam escaping under pressure from the tips *c* to impinge upon or enter into the flame of the burning gas or inflammable vapor burning at the burners *b*, thus causing the flame to impinge upon the pipes of the heating-coil or system of heating-pipes A.

I preferably lay or coil the gas-pipe B and the air or steam pipe C in relation to the pipes of the heating-coil or system of heating-pipes A and in relation to each other so that the flame of the burning gas or inflammable vapor burning at the burners *b* shall be impinged upon by the current of air or steam flowing under pressure from the tips *c* of the pipe C

at right angles, thus causing the flame of the burning gas or vapor to impinge upon the surface of the pipes of the heating-coil or system of heating-pipes A, as shown in Fig. 3; but
 5 said pipes B and C may be arranged and placed so as to cause the flame of the burning gas or vapor to impinge upon any portion of the surface of the pipes of the heating-coil or system of heating-pipes, and may be so placed as to
 10 cause the air or steam escaping from the tips *c* of the pipe C to impinge upon the flame burning at the burners *b* of the pipe B at any desired angle.

Common gas-burners may be used; but I
 15 preferably make use of Bunsen burners, as shown in Fig. 5, wherein *e* shows the opening for the air to enter and mix with the gas.

Perforations whereat to burn the gas may be used, if desired, instead of gas-burners, and
 20 perforations whereat to discharge the air or steam conveyed by the pipes C may be used, if preferred, instead of tips. I make use of either as circumstances may seem to dictate.

The gas-pipe B and the air or steam pipe C
 25 may be attached to the pipes of the heating-coil or system of heating-pipes by any suitable fastening, or may be left without such fastenings, as may be desired; but I preferably fasten said pipes to the pipes of the heating-coil by means of a metal strap, which strap
 30 encircles said pipes and is riveted together, as shown in Fig. 7 at J.

In heating a flat coil or system of heating-pipes, I preferably lay the gas-pipe B and the
 35 air or steam pipe C at the side of each pipe of the heating-coil or system of heating-pipes, as shown at B and C in Fig. 2, and either bend the gas-pipe B and air-pipe C near the return-bends of the system of heating-pipes or cause
 40 them to pass from pipe to pipe of the system of heating-pipes by use of elbows or other suitable appliances. The gas pipe B and the air-pipe C may, however, be placed in position, so that the flame of the burning gas or vapor,
 45 *d*, as it is impinged upon by the current of air or steam escaping under pressure from the tips of the pipe C, shall be caused to impinge upon the pipes of the heating-coil or system of heat-

ing-pipes at any desired point on its surface and at any desired angle.

If desired, any gas or gaseous compound other
 50 than that flowing through pipe B may be allowed to flow through pipe C and into or upon the flame *d*.

The operation of my invention is as follows: When the gas is turned on and ignited at the burners *b* of the gas-pipe B and the air or steam is forced through the pipe C and out of the tips *c*, the air or steam flowing from the tips *c* will impinge upon and mingle
 55 with the flame *d*, forming what is commonly known as a "blow-pipe" flame by supplying an extra amount of air and greater impetuosity to said flame, producing thereby an intense heat, without causing an extra consumption of the
 60 gas or inflammable vapor supplied by the gas-pipe B. The flame, being thus impinged upon by the current of air or steam, will be caused to impinge upon the surface of the heating-pipes A, and will partly or wholly encircle
 70 said heating-pipes.

Having fully described my invention and its operation, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a heating-pipe with a
 75 gas-pipe and an air or steam pipe running parallel with said heating-pipe, said gas-pipe and air-pipe being provided with correspondingly-located apertures throughout their length, arranged so that the jets of air and gas from said
 80 pipes will converge on said heating-pipe throughout its length, substantially as set forth.

2. A coil of heating-pipe, in combination with a corresponding coil of gas-pipe, provided at intervals with burners discharging against
 85 said heating-pipe, and an air or steam pipe coiled parallel with said gas-pipe and heating-pipe and perforated at points corresponding to said burners, in order that a jet of air or steam may converge with the flame from each
 90 burner on said heating-pipe, substantially as set forth.

WALTER M. BROWN.

Witnesses:

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 JULIUS F. HARRIS.