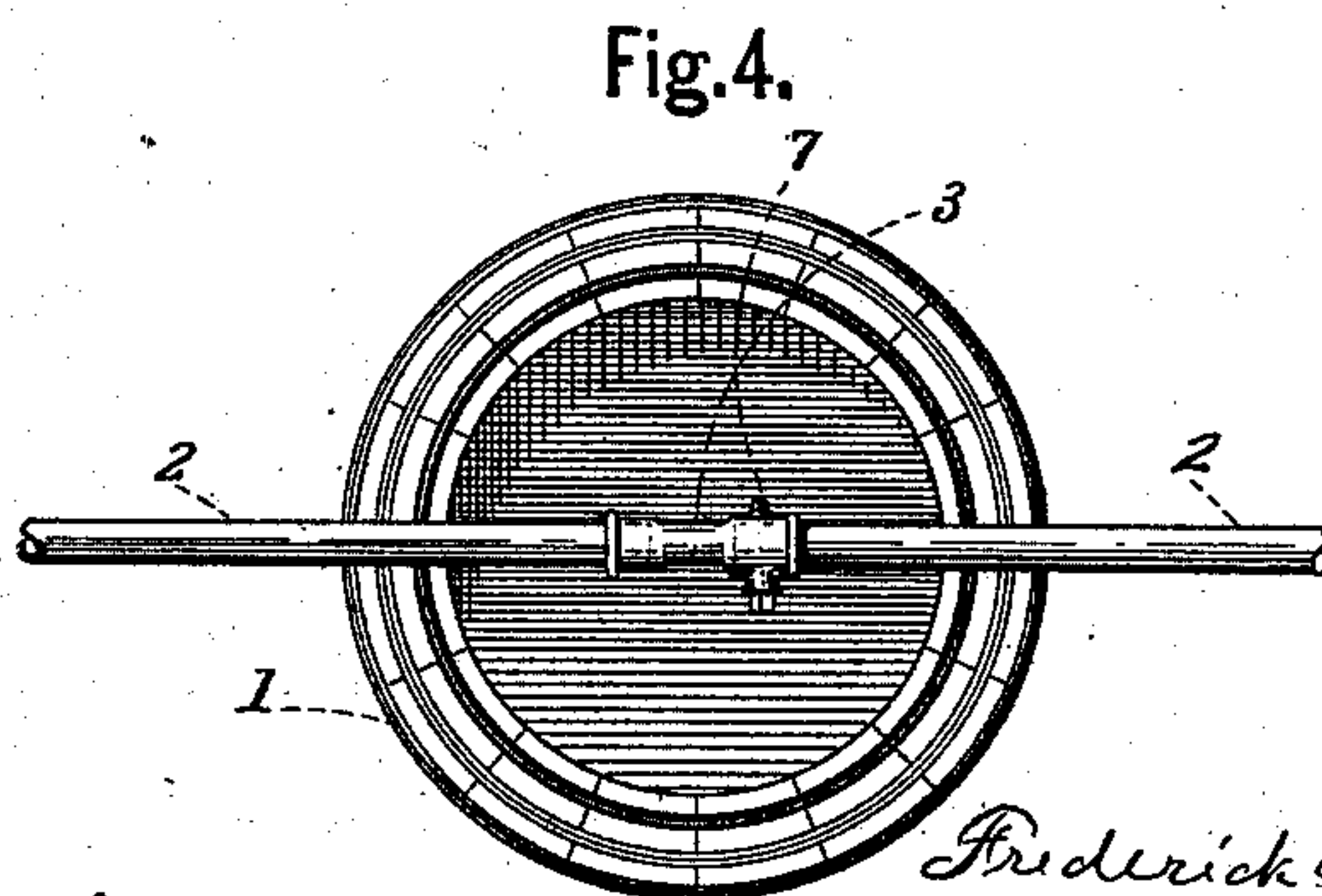
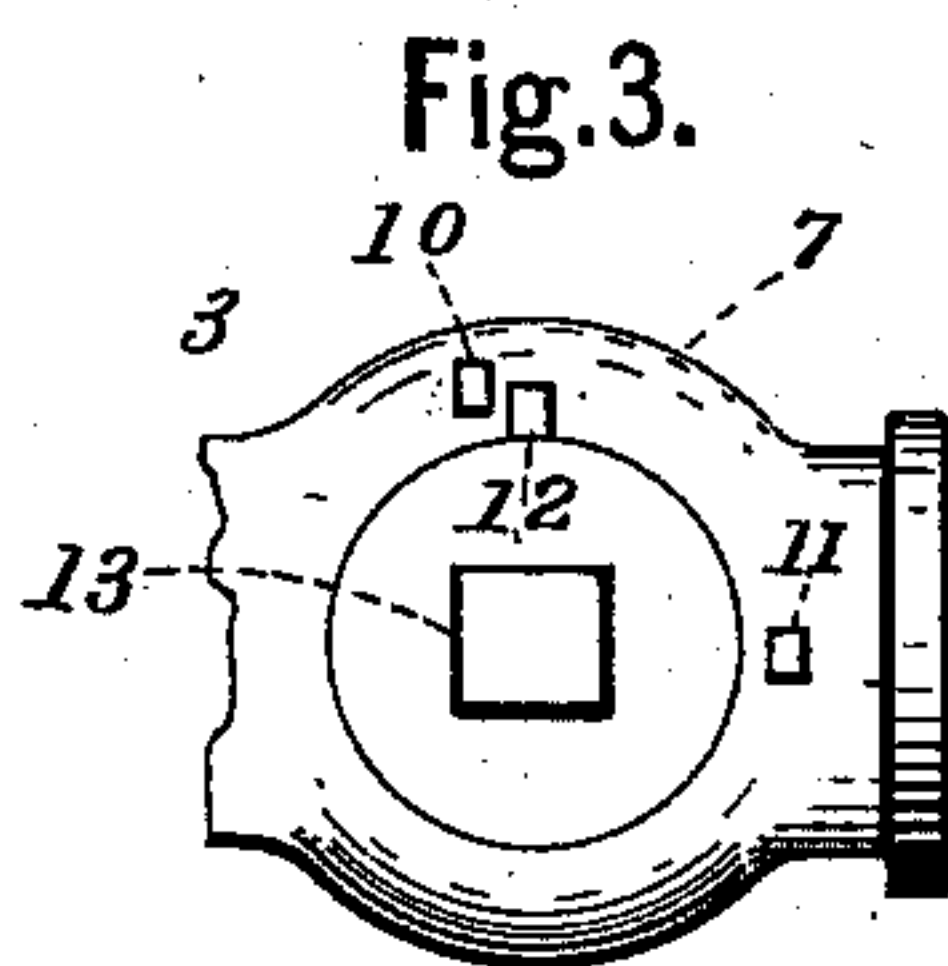
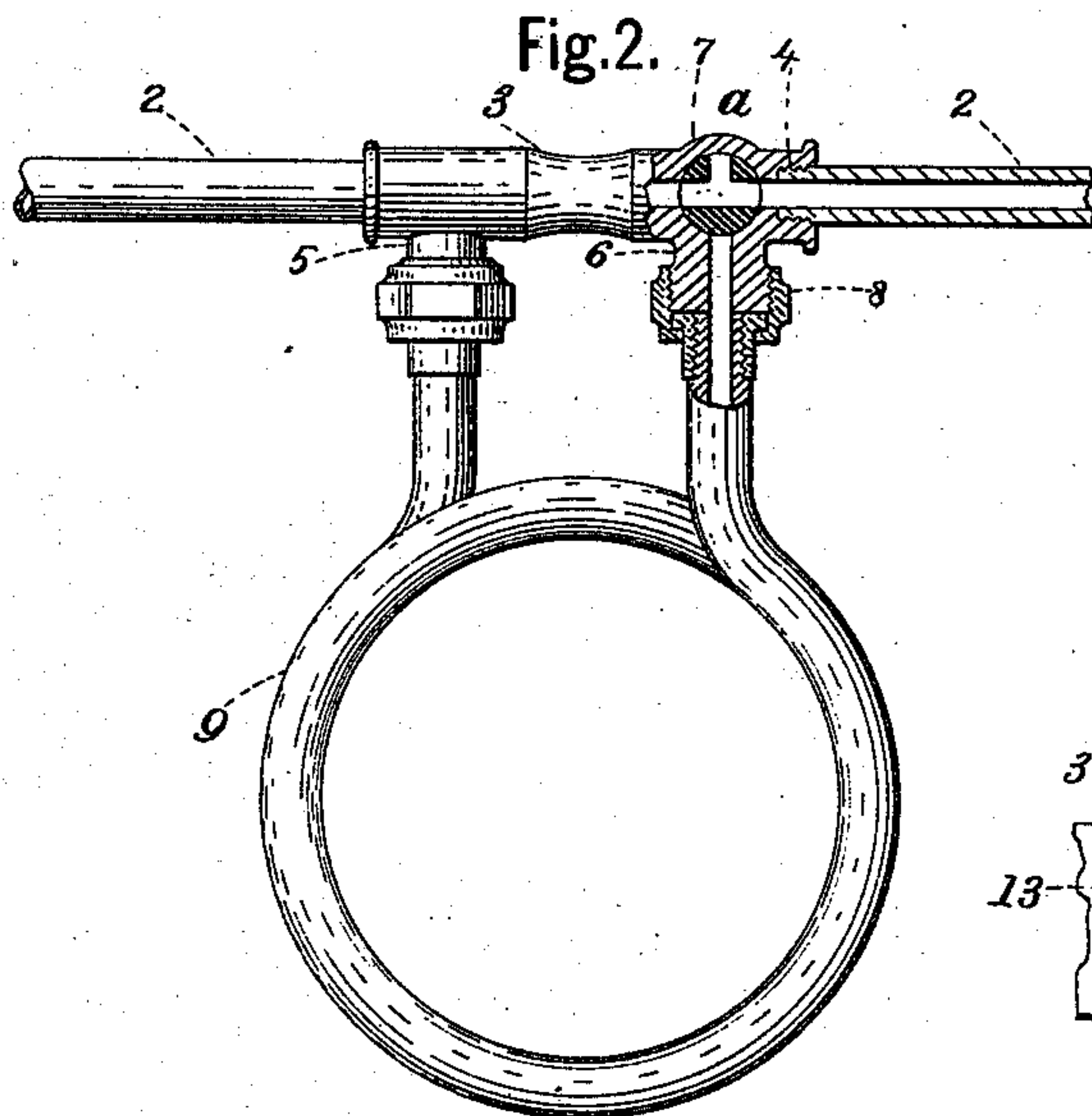
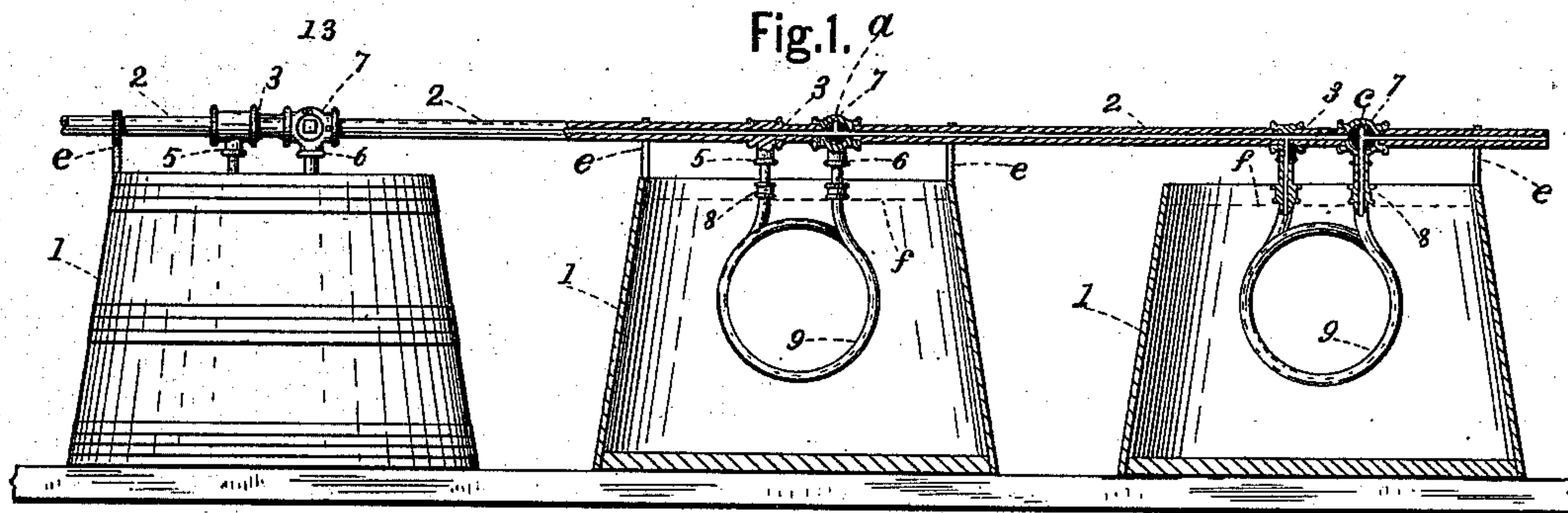


(No Model.)

F. X. KUHN.
LIQUID COOLER.

No. 413,806.

Patented Oct. 29, 1889.



Witnesses.
Arthur J. Sangster
Judson B. Rose

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UNITED STATES PATENT OFFICE.

FREDERICK X. KUHN, OF BUFFALO, NEW YORK.

LIQUID-COOLER.

SPECIFICATION forming part of Letters Patent No. 413,806, dated October 29, 1889.

Application filed August 27, 1888. Serial No. 283,907. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK X. KUHN, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Temperators for Adjusting the Temperature of Liquids, of which the following is a specification.

My invention relates to certain new and useful improvements in liquid-coolers, whereby a series of vats may be operated upon one at a time, or any single vat or any intermediate vat in the series may be operated upon to the exclusion of the rest, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation showing a series of vats and my invention connected therewith, a portion of the vats being in section, so as to show more clearly the invention as applied thereto. Fig. 2 is an enlarged detached side elevation of one of the coils, a portion being in section or broken away, so as to show the construction of the two-way cock for operating it. Fig. 3 is an enlarged front elevation of a portion of the two-way cock or valve. Fig. 4 is a plan or top view of a single vat and the liquid-cooler connected with it.

Directly over the series of vats 1 is a horizontal, or a series of horizontal, pipes 2, having intermediate portions 3, connected with the pipes 2 by the well-known screw-joints 4. (See Fig. 2.) These horizontal pipes are mounted on vertical bars *e*, but may be supported in any well-known way. The portions 3, as shown in Figs. 1, 2, and 4, are each provided with T connecting portions 5 and 6 and with a two-way cock or valve 7. To the T portions 5 and 6 is connected by the usual screw-couplings 8 a downwardly-projecting coil 9, made, preferably, of wrought-iron covered with a good hard varnish to protect it from rust; but it may be covered with zinc, tin, or other protecting material. The two-way cock 7 is provided with the usual projecting stops 10 11 and a projecting stop 12 on the valve or key (best shown in Fig. 3) for limiting its movement either way.

When it is desired to cut off all communication with the coils 9 and open a straight

way through the horizontal pipe or pipes 2, the valve is turned into the position shown at *a*, Figs. 1 and 2, and when it is necessary to open a passage through the pipe or pipes 2 down through any one or all of the coils the valve or valves should be turned into the position shown at *c* in Fig. 1.

The temperature of the liquid is regulated in the vats by forcing the cooling-liquid (ice-water, for instance) through the coils, which, as will be seen, are immersed below the surface of the liquid, the level of which is shown by the dotted lines *f* in Fig. 1. From this construction it will be seen that should the liquid in any of the vats be reduced to the temperature required the cooling-liquid may be shut off from the vat and permitted to pass through the horizontal pipes or to the coil in the next vat, if necessary; or the coils in the several vats may all be shut off and all the cooling-liquid allowed to pass through the horizontal pipes.

The valve-keys are each provided with a square head or wrench section 13, and an ordinary square socket-wrench is used having sufficient length to enable an operator to reach across a large vat to operate it.

These coils may be made of copper or brass, if desired, or lead or tin for some purposes. For some materials copper may be better than iron; but in the manufacture of beer iron answers a very good purpose.

An equivalent for the two-way cock 7 would be a common cock or valve of any kind in the pipe between the coil and the coupling 8, and another stop-cock of any well-known construction located in the horizontal pipe at or about the point shown by the numeral 3 in Fig. 2, so that by closing the stop-cock in the vertical portion of the pipe forming part of the coil and opening the one in the horizontal portion the liquid would pass directly through the horizontal pipe, or by closing the stop-cock in the horizontal pipe and opening the one in the vertical pipe a free passage-way would be opened through the coil; but this construction, although it could be made to operate by moving the valves carefully and simultaneously, would not operate so well as the two-way cock, because when the pressure is great, if one should be opened first, there

would be danger of bursting the pipes, whereas by the two-way cock both passages may be opened or closed exactly at the same time.

I claim as my invention—

- 5 1. In a liquid-cooler, the combination, with a series of vats, of a series of tubular coils suspended therein from a horizontal or substantially horizontal pipe, each coil having an open passage at one end thereof leading to
10 and through the pipe and at the other end a two-way cock for opening or closing the passage either through the coil or through the pipe, whereby any coil in the series or the
15 whole number of coils may be brought into action, or any one coil may be shut off without interfering with the action of the other coils, substantially as described.

2. A liquid-cooling device consisting of a coil of pipe having its two vertical ends connected to and communicating with a horizontal pipe, and a means consisting of a stop cock or valve for opening the passage through the coil and closing it through the horizontal pipe at the same point, so that the fluid may pass around through the coil and through the horizontal pipe beyond the valve, or closing
25 the passage in the coil and opening the passage through the horizontal pipe, substantially as described.

FREDERICK X. KUHN.

Witnesses:

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