

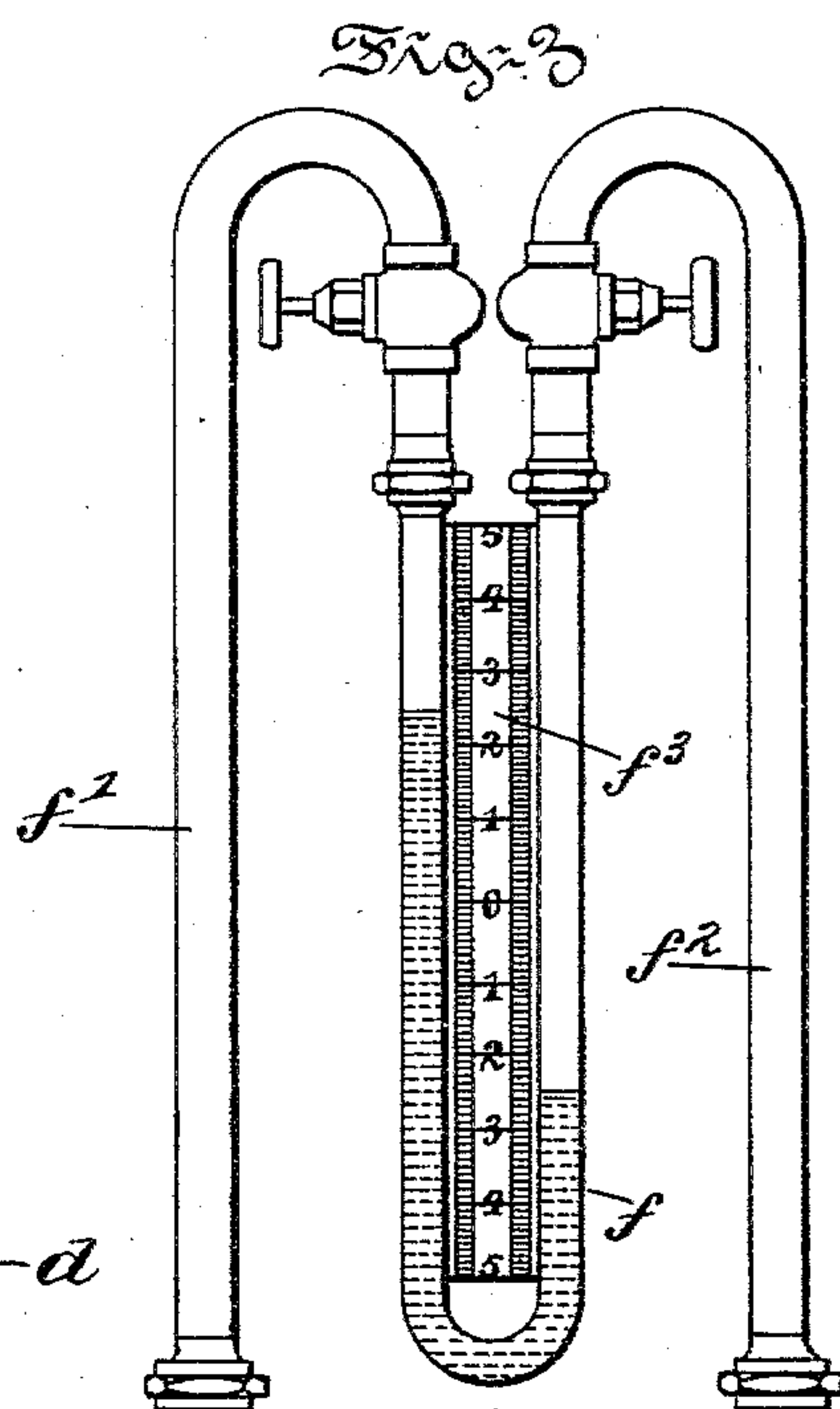
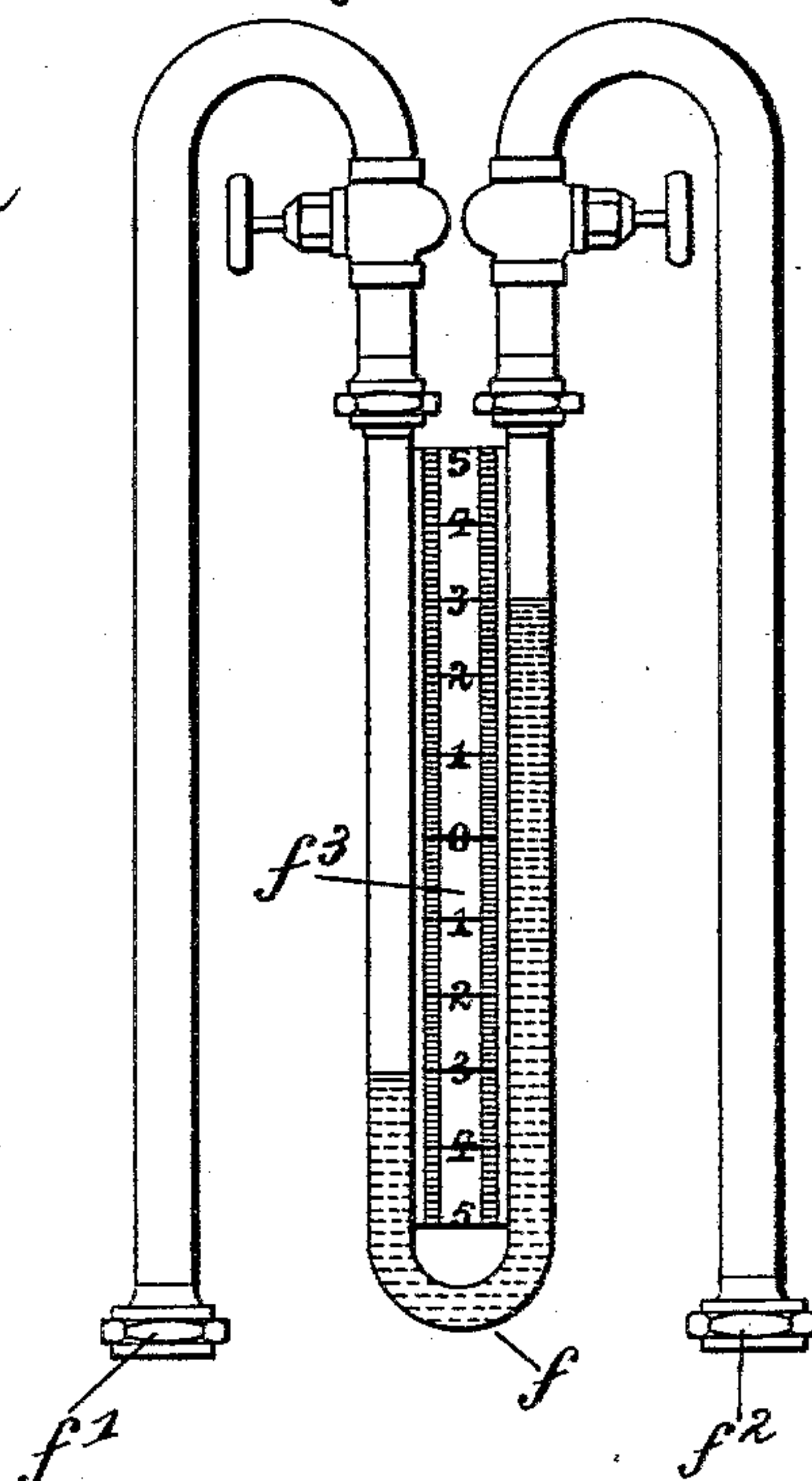
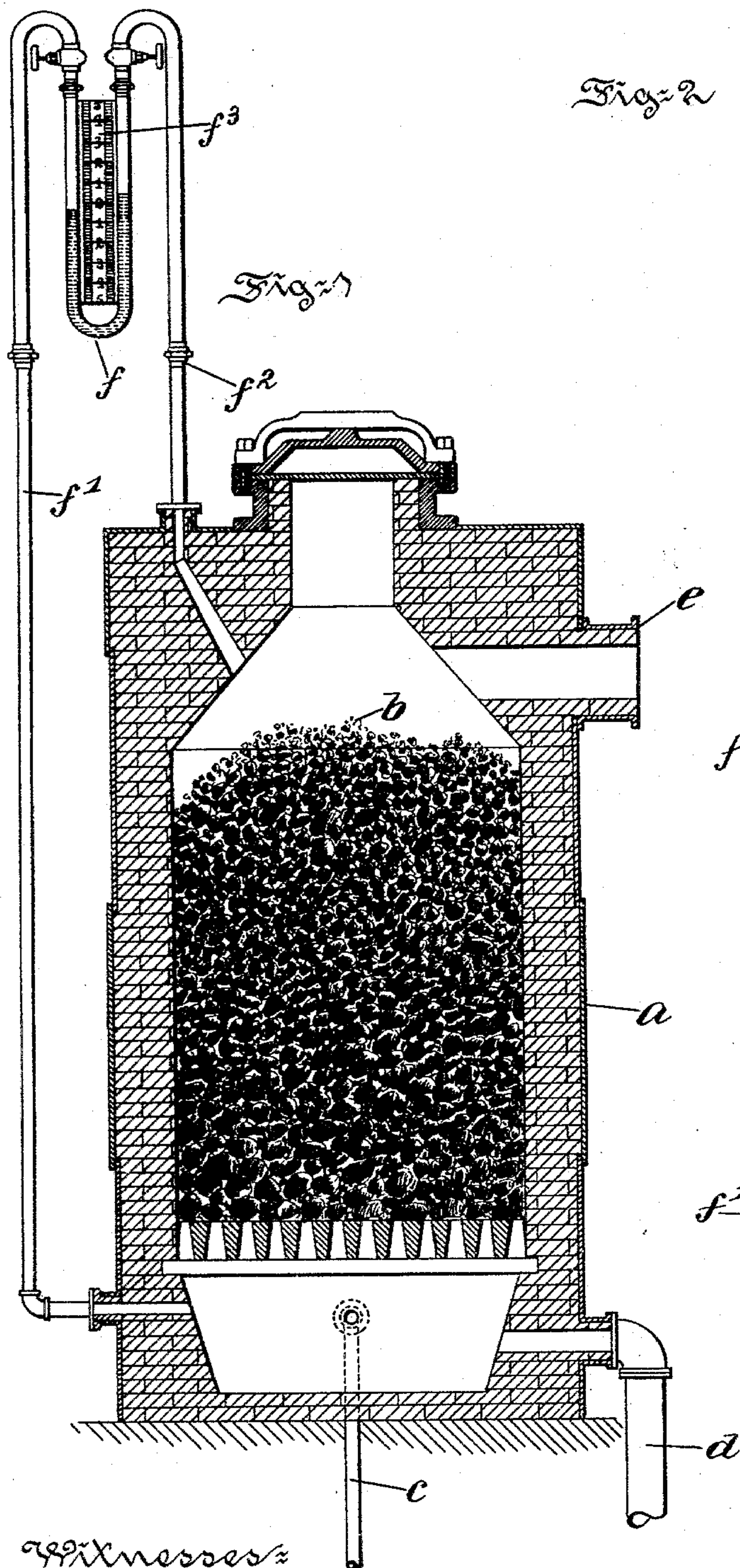
(No Model.)

H. K. MORRISON.

FIRE CONDITION INDICATOR FOR GAS GENERATORS.

No. 563,786.

Patented July 14, 1896.



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UNITED STATES PATENT OFFICE.

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FIRE-CONDITION INDICATOR FOR GAS-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 563,786, dated July 14, 1896.

Application filed February 12, 1896. Serial No. 579,098. (No model.)

To all whom it may concern:

Be it known that I, HENRY K. MORRISON, a citizen of the United States, residing at Concord, in the county of Merrimac and State of New Hampshire, have invented a new and useful Fire-Condition Indicator for Gas-Generators, of which the following is a specification.

According to the well-known Lowe process of producing carbureted water-gas, air is admitted to a generator either above or below a bed of fuel, the resulting gaseous products being permitted to escape after being in part or in whole utilized for the purpose of preheating the apparatus. Subsequently the supply of air is cut off and steam is admitted to the generator and traverses the fire for the production of water-gas, which may be subsequently carbureted. In such process, as well as in others, it is important that the fire should be kept properly freed from dirt, cinders, clinker, and the like, or, in other words, should be clean; otherwise the best results cannot be attained.

It is the object of my invention to provide simple, reliable, and efficient means for indicating the condition of the fire within the generator; and to this end my invention consists of the improvements hereinafter described and claimed.

The nature, characteristic features, and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a sectional view illustrating a fire-condition indicator and a water-gas generator embodying features of my invention, and Figs. 2 and 3 are detached views illustrative of the mode of operation of my invention and hereinafter referred to.

In the drawings, *a* is a generator adapted to contain a bed of fuel *b* and provided with connections for introducing air or steam either above or below the fuel, and with an offtake for gas. As shown in the drawings, the air and steam inlet connections *c* and *d* discharge into the generator beneath the bed of fuel *b*, and the gas offtake *e* is disposed above the bed of fuel *b*.

Having thus described one type of generator suitable for application in connection with my invention, I will now proceed to describe the latter, although it must be borne in mind that other types of generators may be employed in connection therewith.

f is a differential pressure-gage communicating with the interior of the generator *a*, above and below the bed of fuel *b*. The type of differential gage shown in the drawings comprises a U-shaped tube containing a suitable fluid, as mercury or water, and having pipe connections, as *f'* and *f''*, from its respective legs to the interior of the generator at points above and below the bed of fuel. These pipes may be provided with valves intended for use in case of accident and are normally open.

f''' is a scale that may be supplied for convenience of observation of the position of the fluid in the tube of the differential pressure-gage *f*.

The mode of operation of apparatus embodying features of my invention may be described with reference to the accompanying drawings as follows: Assuming that air is being introduced through the inlet-pipe *d*, the pressure above the fuel will depend upon its freedom from dirt, cinders, clinker, and the like, or, in other words, upon its condition. The pressure beneath the fuel is transmitted, by way of the pipe *f'*, to one side of the differential pressure-gage *f*, and the pressure above the fuel is transmitted, by way of the pipe *f''*, to the other side thereof, so that the pressure-gage indicates the difference in pressure above and below the bed of fuel. If the bed of fuel is clean, it may be assumed that the pressure-gage would stand as shown in Fig. 1. If the bed of fuel is not clean, air may not readily traverse it, so that the relative difference in pressure above and beneath it will change, and this change will be indicated by the differential gage, which will stand, for example, as represented in Fig. 2, and would thus indicate by its changed position to the attendant in charge that the fire or bed of fuel in the generator was not clean and required attention before the process of gas-making could be advantageously proceeded

with. If the generator were constructed in such manner that air or steam was introduced above the fire or bed of fuel, then the differential gage would stand (subject to variations in the height of the fluid) substantially as shown in Fig. 3, so that under these circumstances the attendant in charge would be able to ascertain by reference to the differential gage the condition of the fire within the generator.

It will be obvious to those skilled in the art to which my invention appertains that modifications may be made in details without departing from the spirit thereof. Hence I do not limit myself to the precise construction and arrangement of parts hereinabove set forth and illustrated in the accompanying drawings; but,

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A fire-condition indicator for gas-gener-

ators comprising the combination of a generator adapted to support a bed of fuel intermediate of its ends and of air-inlet and gas-outlet connections, with, pressure-pipe connections communicating respectively with the interior of the generator near its ends and with a differential pressure-gage, substantially as described.

2. A fire-condition indicator for gas-generators comprising the combination with a generator adapted to support a bed of fuel intermediate of its ends, of pressure-pipe connections communicating respectively with the end portions of the interior of the generator and with a differential pressure-gage, substantially as described.

In testimony whereof I have hereunto signed my name.

HENRY K. MORRISON.

In presence of—

I. W. HILL,

H. P. HAMMOND.