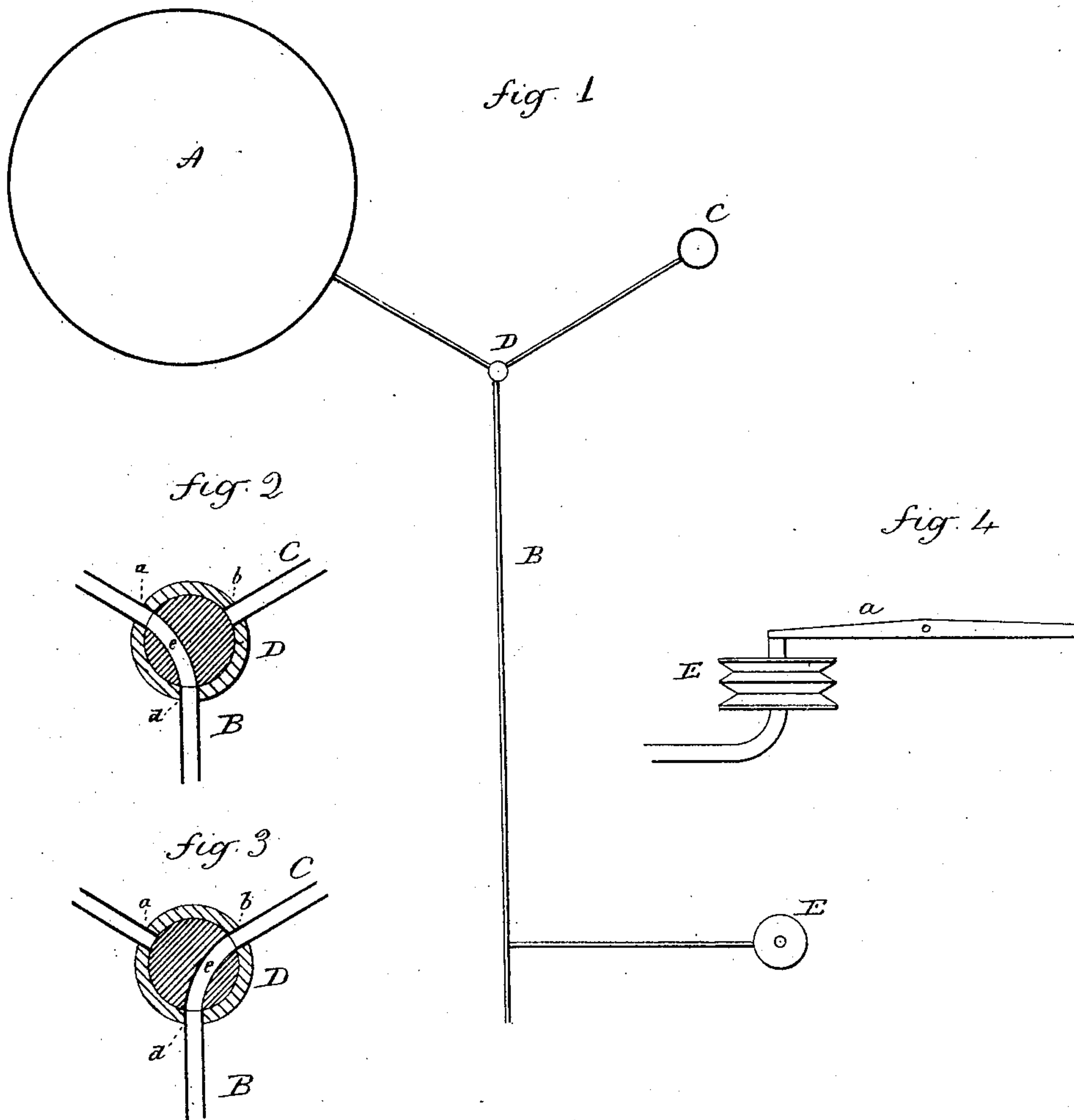


(No Model.)

L. WALDO.
SYNCHRONIZING CLOCK.

No. 268,322.

Patented Nov. 28, 1882.



Witnesses:

John H. Chumway
John D. Earle

Leonard Waldo.
Inventor

By *A. H. H.*

Amos E. H.

UNITED STATES PATENT OFFICE.

LEONARD WALDO, OF NEW HAVEN, CONNECTICUT.

SYNCHRONIZING CLOCKS.

SPECIFICATION forming part of Letters Patent No. 268,322, dated November 28, 1882.

Application filed July 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, LEONARD WALDO, of New Haven, in the county of New Haven and State of Connecticut, have invented new Improvements in Synchronizing Clocks; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view, illustrating the system; Figs. 2, 3, and 4, detached views, enlarged.

This invention relates to a means for regulating numerous clocks from a single clock or regulator. Communication between a regulating-clock and other clocks, or between some point of regulation and the clocks, has been made by means of wires and electric currents, the circuit being made and broken at certain predetermined times to bring the pointers of the clock to the exact position at such predetermined time, and such communication has also been made through pneumatic tubes arranged between the point of regulation and the clocks to be regulated, by giving to the air in the tubes that impulse at said predetermined time or times. The first is expensive and liable to derangement. The second is expensive and inconvenient, because it requires the laying of pipes specially for the purpose.

The object of my invention is to make this communication at a trifling expense and without the possibility of derangement; and it consists in combining with the gas-holder and gas-mains of a common gas-lighting system a second gas-holder, which may be of small capacity, and in which common gas or its equivalent shall be held under a pressure greater than the natural or regular pressure in the gas-mains, communication being made between the said high-pressure holder and the mains by mechanism to be operated at a predetermined time to open communication from said high-pressure gas-holder to the mains, at the same time cutting off the said mains from the principal gas-holder, whereby the high pressure which is let into the mains will communicate to the gas in the mains an impulse which will

be felt throughout the entire extent of the system and communicated to the synchronizing mechanism of clocks which may be put into connection with the gas in the mains, and, so soon as the impulse has been given, operates to cut off the high pressure and reopen communication with the principal holder, and as more fully hereinafter described.

A represents the principal gas holder, and in which the pressure is the regular working pressure of the system, and from which the main B receives its gas in the usual manner.

C is a small gas-holder, in which the pressure of gas is considerably greater than that in the principal holder, but is in communication with the main by means of a three-way cock—one, *a*, opening toward the principal holder, the second, *b*, toward the high-pressure holder, the other, *d*, into the main. Through the plug of the cock is an opening, *e*, which in one direction, as in Fig. 2, makes communication between the principal holder and the main and cuts off the high-pressure holder. In the second position, as seen in Fig. 3, communication is opened between the high-pressure holder and the main and cut off from the principal holder. Now, if at any time the plug of the cock be turned from the position seen in Fig. 2 to that in Fig. 3, pressure in the mains will be instantly increased to the extent of the pressure of the high-pressure holder C. Then, if returned to the position seen in Fig. 2, the high pressure is cut off, communication opened with the principal holder, and the pressure in the pipes reduced to the pressure of the principal holder. There is therefore by the turning of the plug of the cock an impulse given to the gas in the main which will be felt throughout the entire extent of the system. This impulse may be imparted to the regulating or synchronizing mechanism by various appliances.

The receiver E may be made in bellows-like form, as seen in Fig. 4, into which gas is led, and which will expand according to the impulse given to the gas in the main. To one of the heads of the receiver one arm, *a*, of a lever bears, the other arm in connection with any device for communicating the impulse. When the impulse is imparted to the gas, as before

described, it will cause an instant expansion of the bellows, which expansion will turn the lever, as seen in broken lines.

It is unnecessary in this specification to describe the various regulating mechanisms for clocks to which the impulse may be imparted. These are too well known to require description, the essential feature of my invention being the imparting to the regulating mechanism an impulse through the gas in the pipes of a gas system.

The cock D may be in connection, say, with an observatory or other point from which the predetermined impulse is to be given by means of wires or otherwise, so that the impulse may be instantly given and so quickly cut off that the increased pressure will not materially affect any burners which may be in operation at that instant. Thus I utilize the gas already in the mains, thereby avoiding all expense of communication between different points. No gas is consumed by the operation, that which is employed to give the impulse being returned to the principal holder, which avoids the expense of the necessary plant for pneumatic or electrical connection and without the same liability of derangement of communication.

What I claim is—

1. The combination of the principal gas-holder, its mains and branches, an auxiliary

holder charged with a higher pressure than that of the principal holder, mechanism, substantially such as described, to open communication between said high-pressure holder and the gas-mains and to cut off the same, with mechanism, substantially such as described, in communication with the gas from the mains, whereby the impulse imparted to the gas in the mains from said high-pressure holder will be imparted through the gas in the mains to the said receiving mechanism, substantially as described.

2. The combination of the principal gas-holder, its mains and branches, a second holder, the pressure of which is greater than that of the principal holder, and in connection with the mains, and mechanism, substantially such as described, for applying the pressure of the said second holder to the mains, at the same time cutting off the principal holder from the mains, and then to cut off the said second holder and restore the connection between the principal holder and the mains, whereby an impulse will be imparted to the gas in the mains and then the normal pressure restored, substantially as described.

LEONARD WALDO.

Witnesses:

GEO. D. MILLER,
JOHN B. REDDAN.