

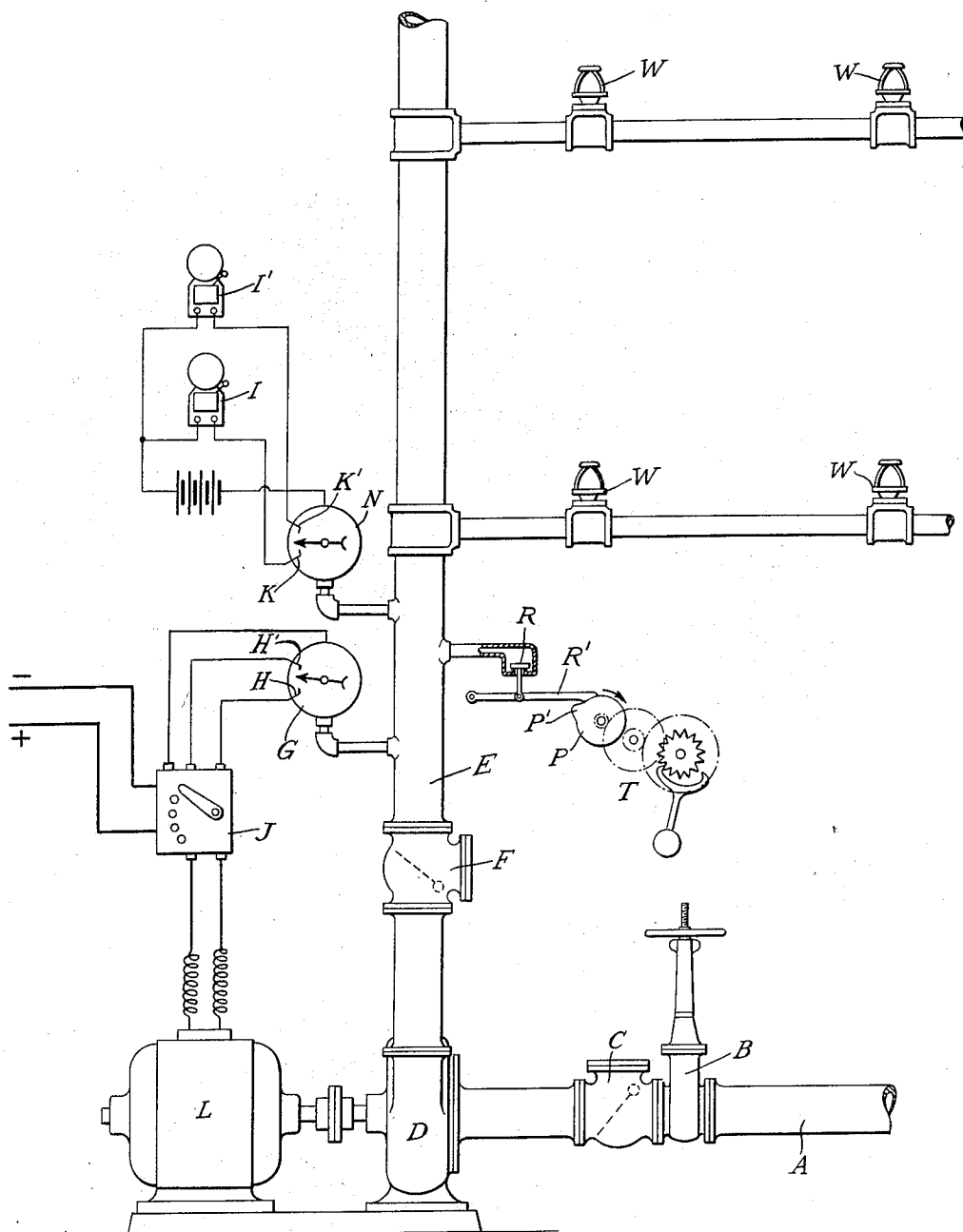
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BOOSTER PUMP APPARATUS FOR FIRE EXTINGUISHING SYSTEMS

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BOOSTER PUMP APPARATUS FOR FIRE
EXTINGUISHING SYSTEMS

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5 Claims. (Cl. 169—13)

My invention relates to automatic fire ex-
tinguisher systems wherein a fire extinguishing
fluid, like for instance water, is supplied under
head to a distributing system of piping and is dis-
charged therefrom in the area or areas to be
protected through suitable outlets, such for in-
stance as the well known fuse-controlled sprin-
kler head.

The invention has to do particularly with sys-
tems of the character indicated wherein, owing
to insufficiency of the head of the source of sup-
ply of the fluid, it is found necessary or desirable
to boost the head or pressure by means of a
booster pump which serves to maintain an effec-
tive pressure in the distributing piping and is
automatically started or operated when the pres-
sure in the system falls below a predetermined
amount.

In order to avoid the possibility of the booster
pump failing to act whenever a fire may happen
it is necessary to test the condition of the pump
and its readiness for operation from time to time
and in order to do this it has been heretofore
proposed to subject the pump to a supervisory
service from a central station from which a test
can be applied through the intervention of elec-
tric circuits and selective devices connecting the
said supervisory station with the starting devices
for the motor, said test being applied at the will
of the supervisor as he may determine is neces-
sary from his observation of indications of the
condition of the system as transmitted to the
central station over an electric circuit usually
provided with selective transmitting devices
which distinguish the signals or indications as
being received or transmitted from different
pumps of a system.

The principal purpose of my present invention
is to make the tests independent of the vigilance
or attention of the central station attendant
thereby avoiding possibilities of failure to test
due to inattention on his part and also avoiding
the necessity of special signalling and supervising
electric circuits.

To this end my invention consists in combin-
ing with the booster pump suitable means for
automatically and at predetermined intervals
causing the booster pump to act independently
of control or operation from a central or super-
visory station, by means of a continuously oper-
ating device such as a clockwork mechanism or
mechanism continuously driven by any suitable
motive power and provided with devices organ-
ized or adjusted to bring the booster motor into
action at recurring intervals of any predeter-
mined duration. Said automatic periodically
operating device may cause the booster motor to
start by any desired manner of control but in
the particular embodiment of my invention as
herein illustrated and described the independent

periodically operating device is caused to start
the pump by producing a fall of pressure in the
pipe to produce through a pressure responsive
device the closure of the operating circuit for
the pump driving electric motor. I do not limit
myself however to the control of the booster
pump motor from the clockwork or other mecha-
nism by the particular means referred to since,
as will be apparent, the invention might be car-
ried out by employing other driving means for
the pump motor and by controlling the action of
the same from the periodically operating clock-
work or similar apparatus through the inter-
vention of other starting and stopping means.

In the accompanying drawing I have shown in
elevation and partial vertical section and dia-
grammatic fashion an apparatus embodying my
invention.

A indicates a water main or water supply under
head or pressure furnishing water to the pipe
of the fire extinguishing system the riser or main
of which is indicated at E. B indicates the gate
valve controlling the supply of water from A
to E, and C a check valve in the connection from
the main to the riser E. D indicates the booster
pump usually of the centrifugal type and driven
by an electric motor L. A second check valve F
is sometimes interposed between the pump and
the riser. The pump takes water through check
valve C and delivers it into riser pipe E to boost
or increase the pressure above that obtainable
from the source A, thereby insuring delivery of
water for the fire extinguishing medium through
the sprinkler heads W or other outlets. G indi-
cates any self-starting electrical actuating gauge
of any of the usual types connected to the pip-
ing E. This gauge responds to decrease of the
normal pressure that it is desired to carry in the
pipe E and is provided in the case of an electric
motor L with a contact H through which a pres-
sure responsive member of the gauge closes the
circuit of the motor-starting box J to start the
motor when the pressure in E falls. It is also
provided with a contact H' whereon the pressure
responsive member makes contact when the water
pressure has been raised by the action of the
booster motor to the desired amount, thereby,
through suitable devices in the starter box J, dis-
continuing the supply of current to the motor L
whose booster action then ceases until such time
as it may again be required to function. N indi-
cates a second pressure responsive device con-
nected to the distributing piping E and respon-
sive to variation of pressure therein. This de-
vice serves to close a contact as for instance K
when the pressure in E drops to the point at
which the pump is desired to start its boosting
action and I is a suitable instrument for record-
ing or registering visibly or audibly the action
of the device N when responding to such fall

of pressure. Another contact K' for the device N or other instrument sends a recording or audible signal when the pressure rises to a point at which the boosting action of the pump D may stop. The instruments I, I' may be in the premises under protection or at a distinct or remote point.

As so far described the apparatus is typical of the system known as the booster pump type of automatic fire extinguishing devices.

In carrying out my invention the instruments I, I' are preferably constructed to automatically give an indication indicating visibly or audibly each of the recurring operations brought about by the use of the device now to be described for bringing the booster pump into operation automatically and at predetermined intervals independently of any control or supervision of an operator or supervisor at any point whether at a supervising station or whether in the premises to be protected.

Referring now to a form of device by which a booster pump may be operated in accordance with my present invention, T indicates a motive device constantly driven by any suitable power as for instance a spring weight or other agent and serving to impart rotation to a wheel P. When the device is spring or weight driven a suitable escapement may be employed to regulate the speed of rotation of the device in imparting rotation to the wheel P which, as indicated, may be provided with a suitable cam P' that periodically and at predetermined adjusted intervals acts on devices for starting the motor L.

In the particular embodiment of my invention illustrated the control of the motor through the action of cam P' is effected by opening a valve R which allows the escape of the fluid from the piping E and so reduces the pressure therein that the starting gauge G will start the motor L after which, as already described, the motor operates until the pressure is brought back to the desired amount when the motor automatically ceases its action through the control of the pressure device or gauge G. To actuate the valve R a lever R' connected thereto may be employed, which lever rides on wheel P and is periodically lifted by the action of the cam to open the valve and hold it open until, through lowering of the pressure in E, the booster pump is brought into action. When the cam has passed to the point that will permit the lever R' to lower under the action of spring or gravity, or other force as for instance the pressure of the water in pipe E, the lever will drop and the valve R will close and remain closed until, after a predetermined interval, through rotation of the wheel P, it is again operated to cause recurring operation of the booster motor L. As will be seen, through the action of the device N and the associated devices I, I', the action of the automatically operating device T in periodically and automatically causing the booster pump to act, will be indicated thereby giving an audible record of the fact that it operates in the normal or intended manner.

As will be seen, the regularly recurring automatic action of the device T takes place independently of any supervision or act on the part of the central or supervising station operator who, in previous systems, is required to first observe an instrument indicating the state of pressure in the system and then as the result

of such observation, to apply a test by operating the booster motor should the conditions as observed by him require such operation.

What I claim as my invention is:

1. In a fire extinguishing system provided with a booster pump, the combination with said pump of automatic testing means comprising means for bringing the pump into operation automatically at predetermined intervals and independent of any supervisory act on the part of an operator or attendant at a central or supervising station said pump being thrown out of action automatically upon the attainment of a predetermined pressure due to the action thereof and indicating means responsive to increase of pressure produced by said pump.

2. In a fire extinguishing system provided with a booster pump and means responsive to a lowering of pressure in the system and thermostatically controlled for bringing the pump into action, of automatic testing means comprising means for automatically lowering the pressure in the system independently of thermostatic action and at predetermined recurring intervals and means for indicating attainment of predetermined pressure due to the action of the pump when brought into operation at each of said intervals as and for the purpose described.

3. In a fire extinguishing system provided with a booster pump for maintaining effective pressure in the distributing piping, and with means responsive to a thermostatically controlled decrease of pressure in the system for bringing the pump into operation, automatic and periodically operating testing means therefor comprising a valve connected with the system and normally closed and means acting automatically and independently of any supervisory act on the part of an attendant for periodically or at regularly recurring intervals opening and then closing said valve said means acting independently of the pressure conditions in the distributing piping and means responsive to increase of pressure due to the operation of the pump thus brought about for indicating the operation thereof.

4. In a fire extinguishing system provided with a booster pump and motor therefor operating automatically upon diminution of pressure in the system, testing means therefor comprising a valve for permitting escape of fluid from the system to lower the pressure and means for operating said valve comprising a constantly driven motive device adapted to periodically and at regularly recurring intervals cause said valve to open and then close independently of fluid pressure condition in the system and means for indicating the attainment of increased pressure due to operation of the testing means.

5. In a fire extinguishing system having a booster pump and motor therefor and means for automatically bringing the same into operation on diminution of pressure in the system thermostatically controlled, of testing means therefor comprising a valve for permitting escape of fluid from the system, means for periodically and automatically causing said valve to open to bring about the operation of the motor and then close and an indicator responsive to increase of pressure produced by the booster pump when brought into action by the operation of said valve.

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