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 MEANS FOR COOLING THE CYLINDERS OF EXPLOSIVE ENGINES.  
 APPLICATION FILED MAY 31, 1907.

913,599.

Patented Feb. 23, 1909.

Fig. 1.

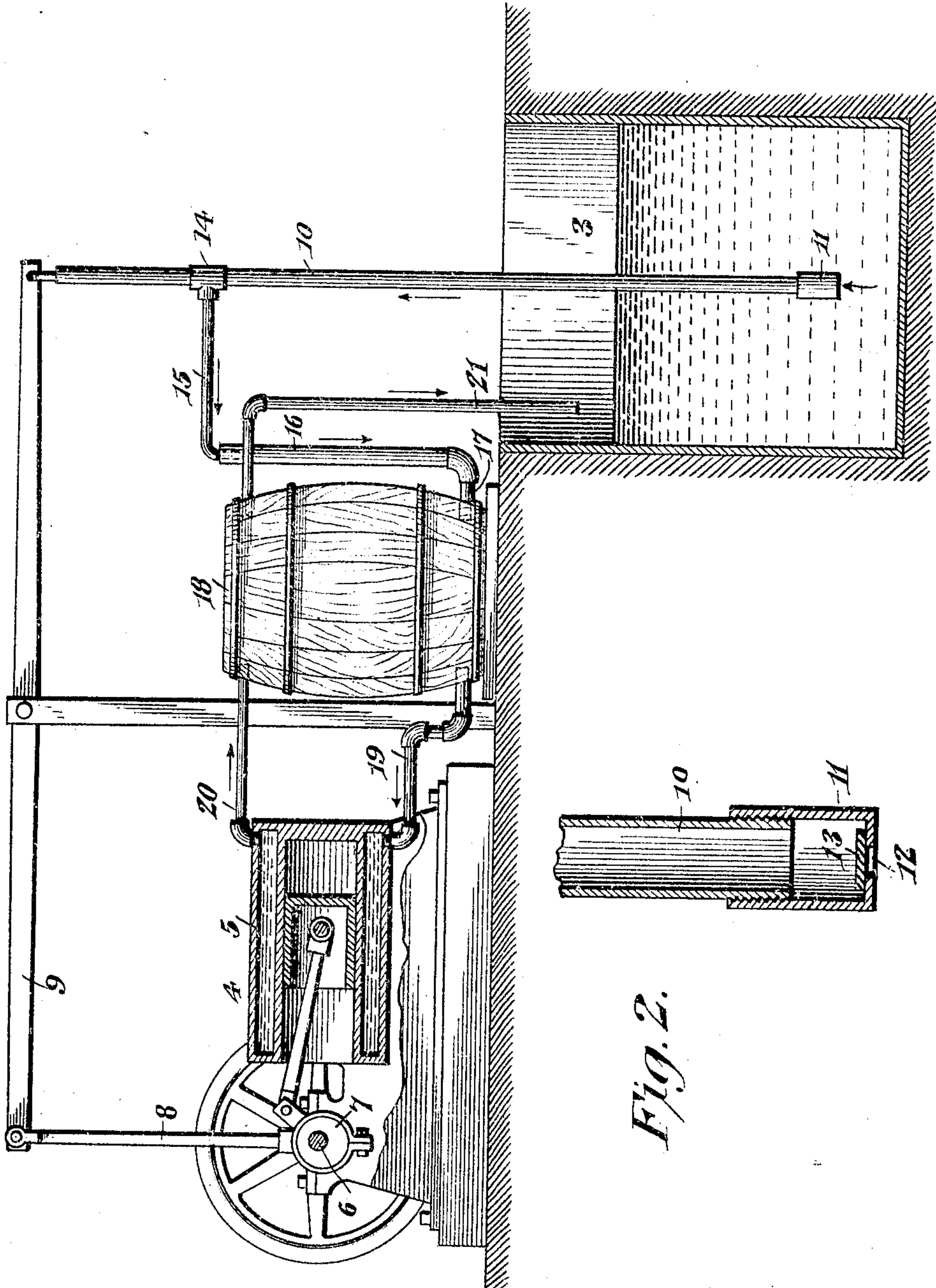
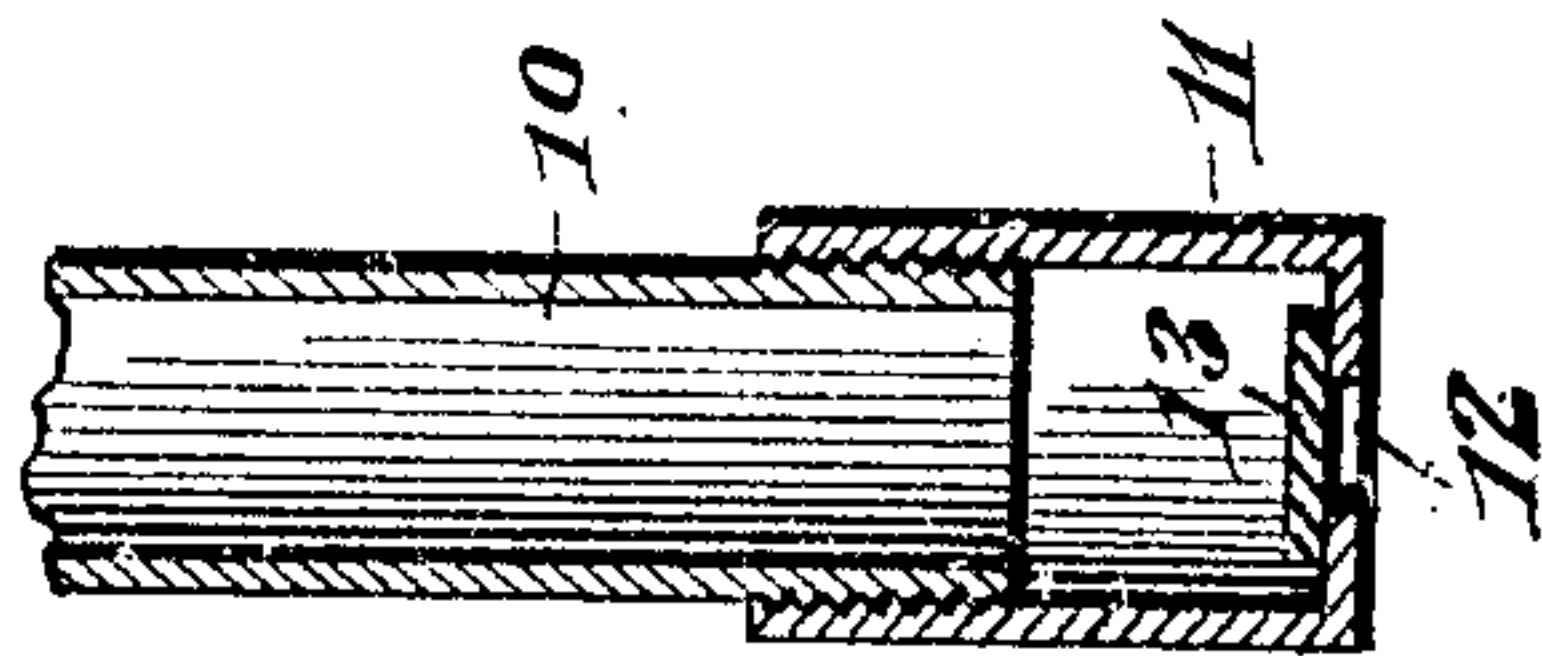


Fig. 2.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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MEANS FOR COOLING THE CYLINDERS OF EXPLOSIVE-ENGINES.

No. 913,599.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed May 31, 1907. Serial No. 376,677.

*To all whom it may concern:*

Be it known that I, DAVID B. WHITEHILL, a citizen of the United States, residing at North Clarendon, in the county of Warren and State of Pennsylvania, have invented a new and useful Means for Cooling the Cylinders of Explosive-Engines, of which the following is a specification.

The present invention relates to mechanism for circulating water or cooling medium through the jacket of an explosive engine, and the principal object is to provide a novel and simple circulating system whereby water may be conveyed from a tank or reservoir to the cylinder of an explosive engine, said water being returned from the explosive engine back to the reservoir or tank, the latter being located so that the water contained therein is in no danger of being frozen solid.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a view partly in elevation and partly in section of the novel mechanism. Fig. 2 is a detail sectional view, showing the valve of the water supplying means.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, a tank or reservoir 3 is shown, which is located in the ground in convenient relation to the engine to be cooled, and preferably outside the building containing the same. An explosive engine is shown at 4, said engine being of any suitable type, and having a water jacketed cylinder 5. The engine shaft 6 is provided with an eccentric 7. Said eccentric has a link-connection 8 with one end of a walking beam 9. The other end of the walking beam is located over the tank or reservoir 3. This water circulating system comprises a conduit leading from the tank or reservoir 3 to the engine, and a return conduit leading from the engine back to the tank or reservoir, these conduits, in the preferred form of construction, being also connected to a common receptacle. As shown, the supply conduit consists of a plurality of sections, one of which is a pipe 10 suspended from the outer end of the walking beam. The lower end of the pipe 10 is submerged in the water of the tank or reservoir, said lower end carrying a valve casing 11, having an inlet 12 controlled by an inwardly opening valve 13. The upper end of the pipe has a T-coupling 14,

from which extends an offset pipe section 15, the discharge end of this pipe being downturned in the form of a spout that is slidably engaged in the upper end of a stand pipe section 16. The stand pipe section 16 has a connection 17 at its lower end with a receptacle, as for instance a barrel 18, and a pipe section 19, leads from the lower end of the tank or receptacle 18 into the lower portion of the engine cylinder 5. The return conduit comprises a pipe 20 connected to the upper side of the cylinder 5 and having communication with the upper end of the barrel or receptacle 18, and an overflow pipe section 21 also connected to the upper end of the barrel 18 and having its outlet in the reservoir 3.

During the operation of the engine, the walking beam 9 is rapidly operated, and therefore the supply conduit section 10 is rapidly reciprocated. As a result of this rapid reciprocation, the water in the tank or reservoir 3 will be elevated in said section 10, and will flow through the pipe section 15 into the stand pipe 16, and thence into the barrel or receptacle 18. In explanation of the elevating operation, it is to be noted that upon the down stroke of the section 10, the same will move downwardly with respect to the column of water contained therein because of the inertia of such column. Thus the valve 13 will be opened and admit water into the lower end of said section 10. The valve, however, will immediately close on the up-stroke so that the column will be elevated. From the receptacle 18, water will pass into the engine cylinder, and from thence backwardly into the upper portion of the receptacle, from which it returns through the return pipe section 21, into the reservoir 3. It will thus be evident that as long as the engine is in operation, cold water will be continuously supplied to the cylinder, and the warmer water returned to the reservoir, where as it cools, it will sink, and thus be again taken up by the elevating mechanism. By having the reservoir or tank 3 in the ground, there is little liability of the water therein freezing in winter, and at the same time, such water will be maintained in comparatively cool condition. The stand pipe 16 and receptacle 18 are believed to be advantageous inasmuch as a comparatively large body of water is thus disposed between the pumping mechanism and the engine, but this stand pipe and receptacle may be dis-



pened with, and direct connections made between the pipe 10 and the engine. In like manner, direct return connections may be made between the engine cylinder and the  
5 reservoir 3.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention, will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the ad-  
15 vantages of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In mechanism of the class described, the combination with an explosive engine having a water jacketed cylinder, of a reservoir, a supply conduit connected to the water jacket of the engine and having an inlet section loosely suspended and operating  
20 in the reservoir, and means operated by the engine for actuating said section, said section being suspended from and supported by said actuating means.

2. In mechanism of the class described, the combination with an open reservoir located in the ground, of an explosive engine having a water jacket and an engine shaft, a connection between the engine shaft and one end of the walking beam, a supply conduit connected to the water jacket and including a section suspended from the other end of the walking beam and having its lower end located and operating in the open reservoir, and an inwardly opening valve  
35 carried by the lower end of the reciprocatory pipe section.

3. In mechanism of the character described, the combination with a reservoir located in the ground, of an explosive engine having a water jacket and an engine shaft, a connection between the engine shaft and one end of the walking beam, a supply conduit connected to the water jacket and including a section loosely suspended from the other end of the walking beam and having its lower end submerged in the reservoir in spaced relation to the walls thereof, an inwardly opening valve carried by the lower end of the pipe section, and a return conduit  
45 connecting the engine and the reservoir.

4. In mechanism of the character described, the combination with a reservoir, of an explosive engine having a water jacket, a

receptacle located between the engine and reservoir, a supply conduit including a vertically movable section suspended from the reservoir, another section receiving liquid from the suspended section and delivering to the receptacle, and another section leading from the receptacle to the water jacket, a return conduit comprising a section leading from the water jacket to the receptacle and another section leading from the receptacle to the reservoir, and means for operating the vertically movable section of the supply conduit, said means constituting suspending means for said section.

5. In mechanism of the character described, the combination with a reservoir, of an explosive engine having a water jacket, a supply conduit section connected to the engine and having an upstanding end portion, a vertically movable supply conduit section having a valved lower end submerged in the reservoir, and having a downwardly turned upper end slidable in the upstanding end portion of the first mentioned section, and movable means from which the vertically moving section is suspended, said means being connected to and operated by the engine.

6. In mechanism of the class described, the combination with a tank or reservoir located in the ground, of an explosive engine having a water jacket, a walking beam, a connection between one end of the walking beam and engine, a supply conduit connecting the tank or reservoir and the water jacket and comprising a vertically reciprocating elevating pipe section suspended from the other end of the walking beam and having its lower portion operating in the reservoir, an inwardly opening valve carried by the lower end of the pipe, a receptacle having a lower connection with the lower portion of the water jacket of the explosive engine, a stand pipe section connected to the lower portion of the receptacle, a conveyer section for conveying water from the upper portion of the suspended pipe section to the upper portion of the stand pipe section, and a return conduit comprising sections connecting the upper portion of the water jacket and the receptacle and the upper portion of the receptacle and the reservoir.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

DAVID BROWN WHITEHILL

Witnesses:

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L. M. WILLIAMS.