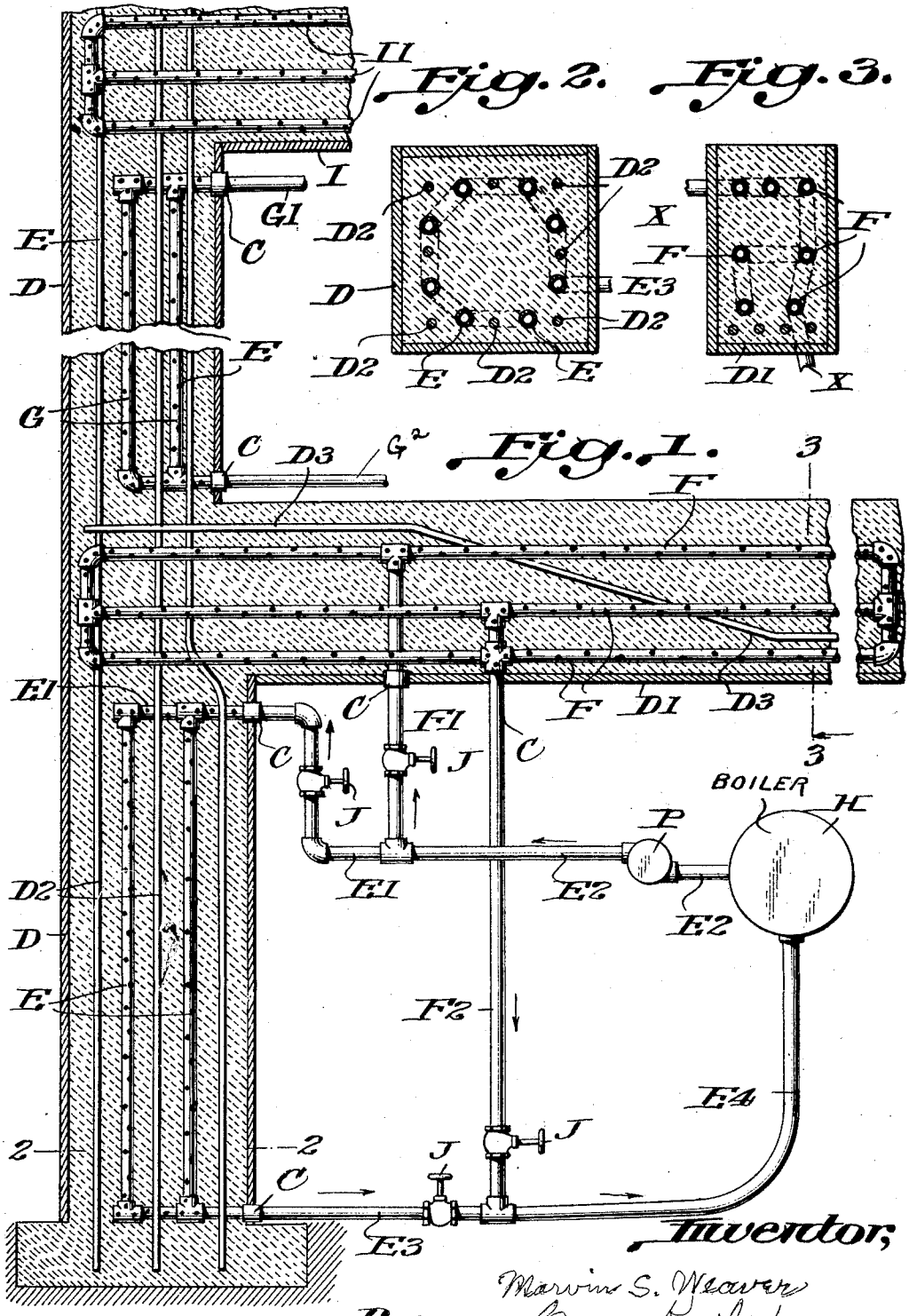
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ART OF MAKING CONCRETE

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ART OF MAKING CONCRETE.

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This invention relates to the making of concrete and particularly to the treating of the concrete mixture with water while the mixture is setting or hardening.

The chief object of the invention is to provide for delivering water into the interior of a mass of concrete mixture placed for setting, the water permeating outward through the mass of mixture and delivery of water into the mass being made while such outward permeation or flow proceeds.

Water-conducting means will extend from a source of water supply under pressure into the mixture mass which has been placed for setting, the part or parts of the conducting means within the mass being perforated or otherwise formed for permitting movement of the water outward into and through the mass. The water may be in the form of liquid or vapor or steam. If liquid or vapor, the temperature may be suited to the weather. During cold weather, heated water and steam will prevent freezing.

In the accompanying drawings,

Fig. 1 is a diagrammatic sectional elevation showing a mold structure and water delivery pipes leading into the structure and to a source of water supply under pressure;

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1;

Fig. 3 is an upright section on the line 3—3 of Fig. 1.

Referring to the drawings, D is an upright mold for forming a column which is to form part of a building and D^1 is a mold for forming a beam having one end joined to said column. D^2 are ordinary reinforcing rods placed in the mold, D, and D^3 are ordinary reinforcing rods placed in the mold D^1. Perforated pipes E, are placed upright in the part of the column below the beam mold, D^1. The upper ends of said pipes are connected by a pipe E^1, which is connected to a delivery pipe E^2, leading from a source of water supply, which may be a container in the form of a tank or boiler H. On the pipe E^2, is a pump, P, for driving water toward the pipe E^1. A pipe E^3, connects the lower ends of the pipes E, and is connected with the return pipe E^4, which leads to the tank or boiler H.

In the beam mold are horizontal perforated pipes F. These pipes also extend into the column mold. A pipe F^1 is connected with the pipes, F, and with the pipe, E^2. A return pipe F^2 is connected with the pipes, F, and the return pipe, E^4.

Above the pipes, F, perforated pipes G, are placed upright in the column mold, D. A delivery pipe G^1 connects the upper ends of the pipes, G, and leads to a source of water supply, which may be the tank or boiler, H. A return pipe, G^2, is joined to the lower ends of the pipes, G, and leads to the source of water supply.

Above the pipes, G, is a beam mold, I, in which are perforated pipes I^1, similar to the pipes F, and connected to the source of water supply by delivery and return pipes not shown.

For the control of flow, any number of valves, J, may be placed on the delivery pipes and the return pipes. When this column mold and the beam molds have been filled with the concrete mixture, preferably including water, the water is to be delivered from the container H, through the pipe, E^2, and pump, P, into the pipes E, F, G and I, the water flow being varied as the setting of the mixture mass progresses, the pressure being slight while the mixture is still soft and not adapted to resist pressure exerted by the water in the perforated pipes, and the flow being appropriately regulated, if the water is in the form of hot liquid or is steam. Thus it is feasible to keep the concrete mixture at a temperature suited to best physical and chemical action in the concrete in any kind of weather and to prevent freezing of the concrete during cold weather.

It will be noted that two sets of upright pipes are put into the column mold. That aids equalizing pressure. If high pipes were used, the water pressure in the upper and the lower parts of the pipes would be unequal to an objectionable degree, the pressure in the lower ends of the pipes being excessive.

Couplings, C, allow detaching the delivery and return pipes at the molds. Thus the perforated pipes remain in the concrete and serve as reinforcing members, said pipes and the rods, D^2, and D^3, together constituting reinforcing means for the concrete.

By trial I have found that, as the end of the setting period approaches, the water pressure may be much increased. I have also found by trial that giving the mixture this ample supply of water during the greater part of the setting period causes greater and more uniform hardening, and consequent strengthening of the concrete, than can be attained by the ordinary means of slowly setting with water applied externally. In other

words, the superior quality of the concrete obtained by my method amply compensates for the use of the mechanism required. Furthermore, by this method, any concrete job can be put through the setting period with practically no labor. When the water connection has been made with the pipes in the molds, the job can be left to itself excepting for occasional adjustment of water flow and heat, if heat is used. Columns, beams, pillars, abutments, slabs, paving, etc., may be thus constructed without the labor of external water treatment and protection against premature drying. The use of heat will be advantageous, especially during cold weather. Thus concrete construction during cold weather will be facilitated. That will tend toward continuous operation by builders and their employees.

It will be understood that if water in the form of steam is used, there will be enough condensation in the mixture mass to provide liquid water for permeating the mass.

I claim as my invention,

1. The herein described method of making a concrete structure, which method consists in mixing the constituents, including water, and placing the wet mixture for setting and enclosing water conducting means in the mass thus formed, the conducting means having an inlet and an outlet, the conducting means permitting lateral movement of water, and then circulating heated water through said conducting means, whereby water permeates outward from the conducting means through said mass.

2. The herein described method of making a concrete structure, which method consists in mixing the constituents, including water, and placing the wet mixture for setting and then passing a heated water stream into and out of the mass thus formed, and allowing water from said stream to permeate said mass.

3. The herein described method of making a concrete structure, which method consists in mixing the constituents, including water, and placing them for setting and then circulating heated water in the interior of the mixture at different elevations and allowing said water to permeate outward through the mixture.

4. In a concrete molding apparatus, the combination of retaining walls forming a chamber, and means extending through said chamber for conducting water into, through and out of said chamber and permitting permeation toward said walls, and piping joined to the inlet and outlet ends of said conducting means to form a flow circuit.

5. In a concrete molding apparatus, the combination of retaining walls, a perforated pipe between said walls, a heating means, and piping intervening the heating means and the perforated pipe and a pump on said piping.

6. In a concrete molding apparatus, the combination of retaining walls, a perforated pipe between said walls, a heating means, piping intervening the heating means and the perforated pipe and communicating with the exterior, and flow-controlling means on the intervening piping.

7. In a concrete molding apparatus, the combination of retaining walls, a water receptacle in the space enclosed by said walls and permitting flow toward said walls, a pump, a heating means, and piping leading from the heating means and the pump to the receptacle.

In testimony whereof I have signed my name, this 12th day of February, in the year one thousand nine hundred and twenty-six.

MARVIN S. WEAVER.