POSSIBILITIES OF THE FUSIBLE CORE PROCESS.

The fusible core process permits the construction of rubber to a desired thickness, and a reinforcement of the rubber with fabric to procure a desired strength upon a core or mandrel that will fuse or melt at a desired temperature, and can be removed from the interior of a rubber article in the form of a liquid after vulcanization.

Previous to this invention, gases had to be relied upon to expand within the rubber under heat. Expansion of this kind was naturally haphazard, and the thickness of the shell of rubber necessarily an unknown quantity.

If a solid mandrel was used to secure proper compression of the rubber, it has heretofore been necessary to cut the rubber to remove the mandrel or core; and revulcanization has had to be relied upon to close up the aperture. Second vulcanization of rubber is never reliable. By this process it is possible to produce, for illustration, water bottles on a core, building them to a desired thickness, compress them with hydraulic pressure, cure from the exterior to the interior, and fuse the core and remove the same through the neck of the bottle in the form of liquid, making a one-piece article built to a proper thickness and desired strength.

A bicycle or automobile tire may be built up in layers around a fusible core, subjected to pressure, cured, and the core fused and removed through the aperture used as a valve stem, in the form of a liquid. Pneumatic recoil cushions can be constructed of any desired strength by building up rubber and canvas around a core to a thickness the strength of which can be mechanically estimated, curing the rubber, fusing, and removing the core in liquid form through the valve stem, which can be afterward used to convey air to the interior of the cushion.

Life preservers can be constructed of a desired thickness to withstand the elements to which they are subjected, and a sufficient aperture constructed in the same to admit such a quantity of air as may be necessary to produce the proper buoyancy. By this process it is possible to cast a core of any desired dimension, building rubber to any desired thickness upon the same, and so secure the exact strength required for the gas container of dirigible balloons. Navigation in the air has heretofore been made practical by the construction of balloons by a combination of silk and rubber with lapped seams. The pressure of the atmosphere is such at various altitudes as to rend the seams, and in this manner destroy the balloon.

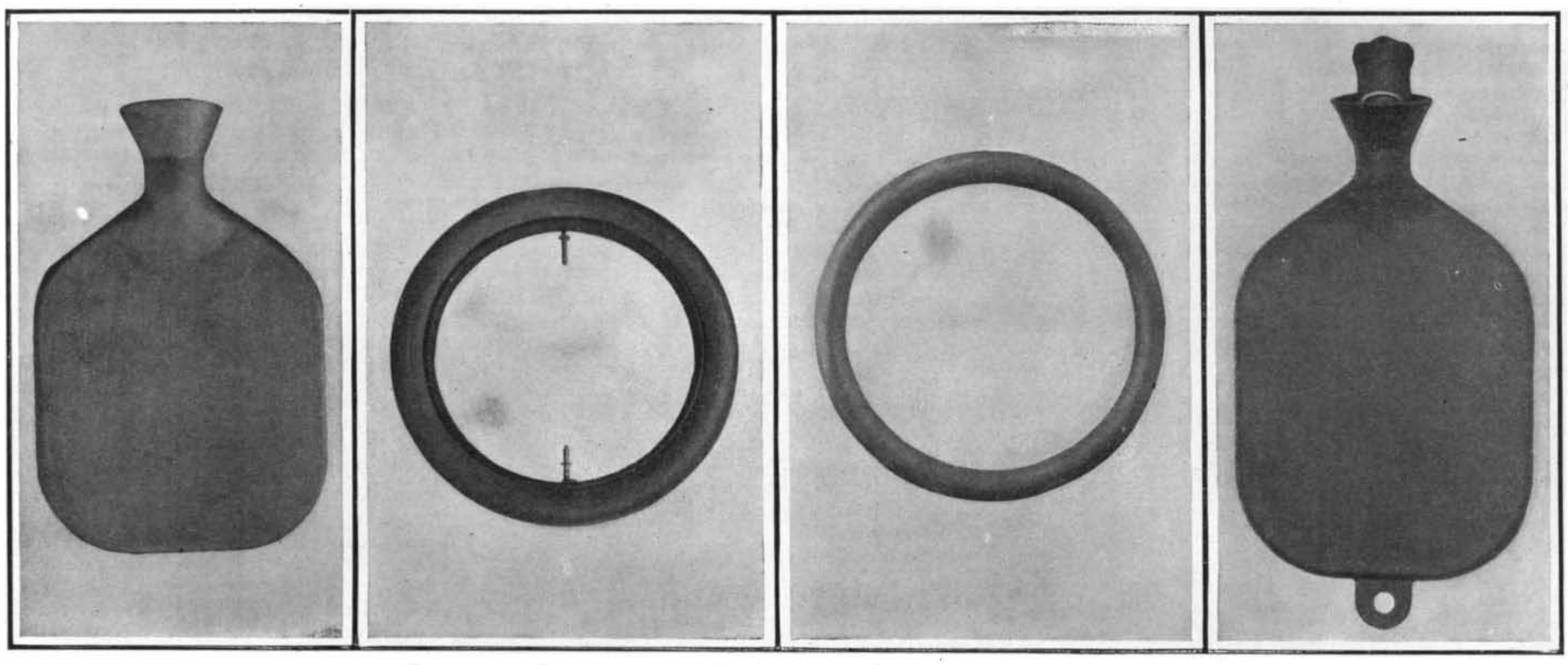
By the fusible core method a reliable thickness of rubber could be constructed over the core and molded, the rubber cured, and the core fused and removed through the valve stem, afterward used as a passage for the hydrogen gases. Construction of this nature can be made absolutely reliable.

This process can be carried still further, and the fusible core cast hollow and filled with air or gases. The rubber can then be built to the desired thickness on the outside, compression used, in conjunction with heat that is not sufficient to soften the core, to compact the rubber by external pressure, and the temperature then raised to a heat necessary to cure the rubber. This heat, radiating as it will to the inside of the core, expands the gases in the core, and when the core liquefies the gases continue their expansion, and assist the external pressure by pressing outward.

Articles cured in this manner have been subjected in the laboratory of the Massachusetts Chemical Company's Walpole Rubber Works to an external pressure of 2,000 pounds to the square inch, and internal gas pressure of 200 pounds per square inch. In this manner the rubber is compressed from all directions into one solid mass. Compression from all directions is as essential to procure perfect rubber goods as curing is.

Some of the large manufacturers of pneumatic tires have discovered this fact, and at the present day many tires or auto shoes are semi-cured on a solid mandrel, the said mandrel removed from the shoe, and a gas bag replaced where the mandrel is removed, and curing continued, so as to get external pressure followed by internal pressure to compact the rubber.

The fusible core process, as worked out and perfected by Mr. F. J. Gleason, vice-president and general superintendent of the Massachusetts Chemical Company's Walpole Rubber Works, bids fair to revolutionize not only many articles of everyday use, like hot-water bottles, rubber goods of every description, automobile and bicycle tires, but those of a more limited use as well, such as balloons, life preservers, etc.



Fusible core upon which water bottle is molded.

The core is melted and discharged through the air valves.

Core upon which adjoining tire was molded.

Bottle after fusible core has been melted and run out.

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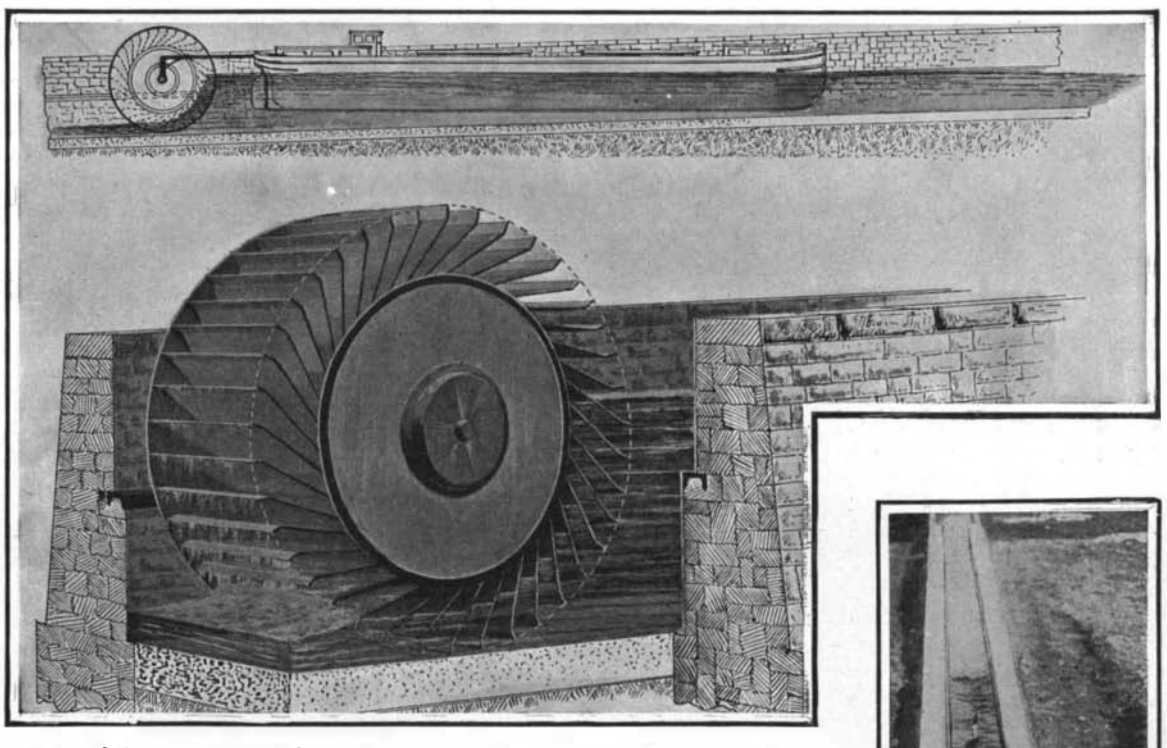
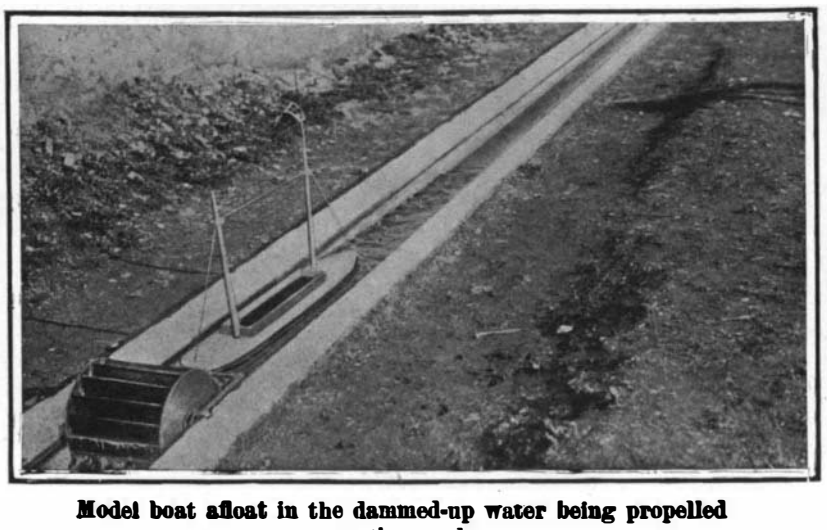
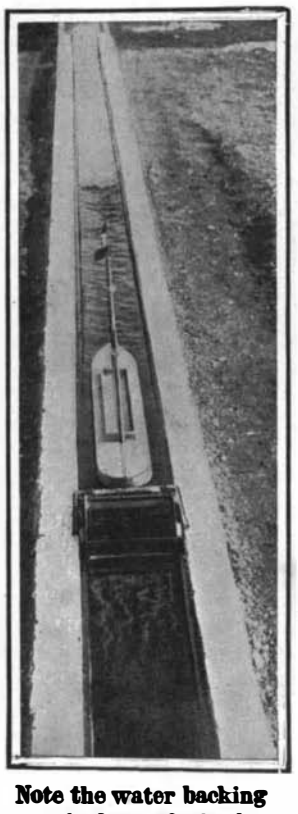


The paddle wheel which dams the water and pushes the boat up grade.



Model boat afloat in the dammed-up water being propelled up the canal.



Note the water backing up in front of wheel.

A MOVABLE LOCK FOR INCLINED CANALS.

A MOVABLE LOCK FOR INCLINED CANALS

BY H. PRIME KIEFFER, C.E.

Engineer Giuseppe Bartolomei of Rome, Italy, has recently invented a movable self-propelled canal lock, which forms one of the cleverest and most ingenious advances since the employment of canals for transportation purposes was begun.