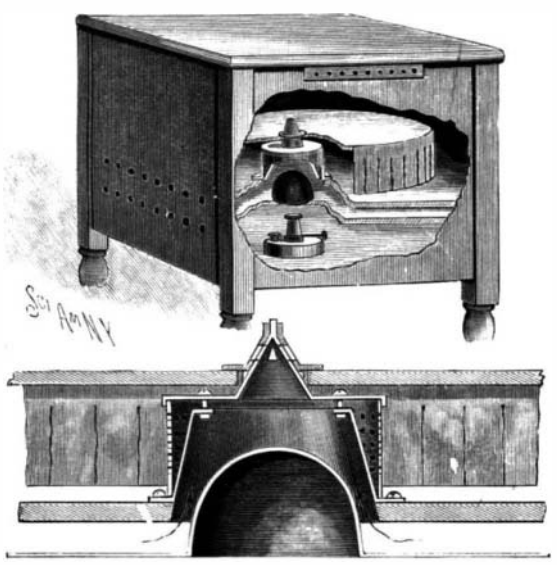
AN IMPROVED CHICKEN-BROODER.

The invention which forms the subject of our engraving is a new chicken-brooder which has been invented by Ernest F. Hodgson, of Dover, Mass., and which provides means whereby the floor of the brooding chamber will not become unduly heated, and whereby the heat passing into the hover-chamber will be under complete control.

Fig. 1 is a perspective view of the brooder, with parts broken away to show the construction. Fig. 2 is a longitudinal section drawn on an enlarged scale.

The chicken brooder comprises a heating-chamber and a brooding chamber placed above the heating-chamber. Within the heating-chamber a ceiling-plate is located, which is provided with a heating-dome projecting into the brooding-chamber. Above the heating-dome and within the brooding-chamber a second dome is secured, which has an open top and which is surrounded by an apertured casing. The second, upper dome is covered by a plate supported from the apertured casing, and provided with a conical projection apertured to permit the ventilation of the brooder. The apertured casing serves to prevent the chicks from coming into contact with the highly heated upper dome; yet the air heated by the two domes may readily pass out through the openings in the casing. Upon the exterior of the conical projection a conical cap is mounted to turn which supports a hover-board, and which is provided with openings registering with the apertures of the conical projection. The hover-board is provided with a downwardly extending marginal apron, forming a hover-chamber.



HODGSON'S CHICKEN-BROODER.

In the operation of the brooder, cold air is drawn in through vent-holes into the space between the brooding and heating-chambers. The heated air passes up into the upper dome and through the apertured casing to the hover-chamber. If the register at the top of the hover-chamber is open, a portion of the heated air escapes, thus cooling the lower portion of the hover-chamber. By means of this arrangement, a constant current of pure warm air is obtained under the hover-board, where the chicks are located. By employing a dome instead of a flat plate, the overheating of the brooding-chamber is prevented.

A SIMPLE VEHICLE WHEEL.

A patent has been granted to Olaus L. Grimsrud, of Lead, South Dakota, for a vehicle wheel embodying in its construction a tubular elastic tire which need not be inflated, and a rim of novel form which receives the tire.

The rim of the wheel comprises two rigid sections flaring outwardly to receive the tire, and converging inwardly to form a trough, the bottom of which is formed by a flange on one of the sections, meeting the inner edge of the other section.

The tire consists of an endless strip of rubber, the longitudinal edges of which are inserted between the converging inner portions of the rim sections. An expanding or shaping section formed of a piece of spring metal semicircular in cross section is located within the tire to force it against the outer portions of the rim sections. The spokes of the wheel are secured to the rim by inserting them in the flange forming the bottom of the trough.

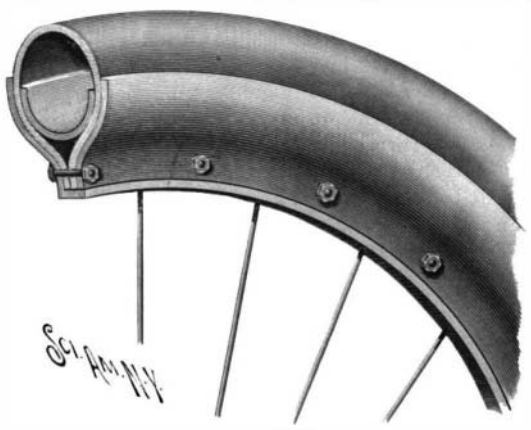
The inventor states that the tire need not be inflated, since the elasticity of the material employed and the manner in which the tire is fitted in the rim will cause the tire to remain expanded.

TURRETS OF UNITED STATES NAVAL VESSELS.

The advent of the "Monitor" upon Hampton Bay, that eventful 9th of March, 1862, was the first introduction into actual warfare of the revolving turret for protecting guns of large caliber.

Ericsson's turret, as is well known, was of the cylindrical, or what is facetiously termed the "cheese-box," type. It was practically an inverted box, resting on the ship's deck when out of action, and raised, guns and all, on a central spindle, around which it was made to revolve, whenever it was desired to point the guns on any particular object. The original plans for the double turreted monitors "Miantonomoh," "Terror," "Amphitrite," "Monadnock," and "Puritan," provided for this type of turret; but, notwithstanding its practical success on the first monitor, many serious objections had subsequently been found to this type, and the turrets of the "Miantonomoh" were changed in 1883 to "roller base;" that is to say, the central spindle was abandoned and the whole turret made to rest on a number of rollers running upon a circular rail or track, located on the lower deck. This arrangement required that the turret pass through the main deck of the ship, with a sufficient opening all around for proper working, and in the case of the "Puritan" this annular opening was as great as 24 square feet in area for each turret. The clearance space was covered with a thin, flexible apron, secured to the side of the turret armor and resting loosely on the deck, so as to permit the turret to revolve freely. This apron was liable to be destroyed by either shot or wave, when, with vessels of low freeboard, the ship would be in danger of foundering. With the advent of the modern, high power, long-range gun, the weight of the turret became excessive; the guns were necessarily close to the deck, and in the monitors too low for effective use at long range, and practically useless even in a moderate seaway.

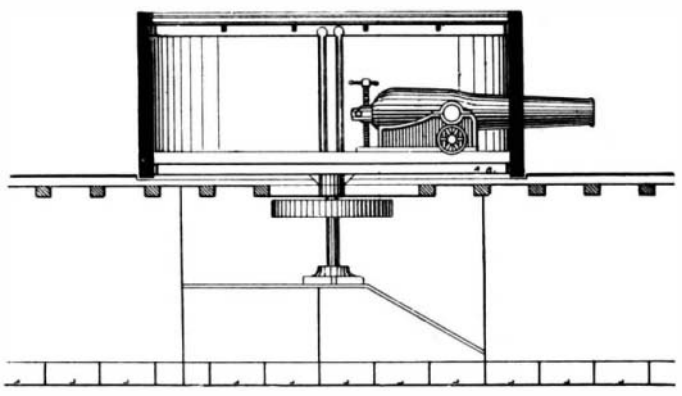
In the double turreted monitors above referred to the adoption of modern guns, in place of the old muzzle loaders, and the installment of machinery for their operation, as well as the appliances for ventilation and electric lighting, began to encroach seriously on the space allotted to officers and crew, and the designers were in a quandary how best to solve the problem, when the present distinguished head of the Construction Bureau, Com. Philip Hichborn, Chief Constructor, U. S. N., took the matter under consideration. He had just returned from a tour of inspection of European dockyards and ship-construction, on which he had been ordered by the Navy Department, and where he had made a special study of turrets, with a view to overcoming the objections to the present type. In order to improve the monitors then under construction, the guns must be raised to a greater height above the water line, and an absolutely water-tight connection



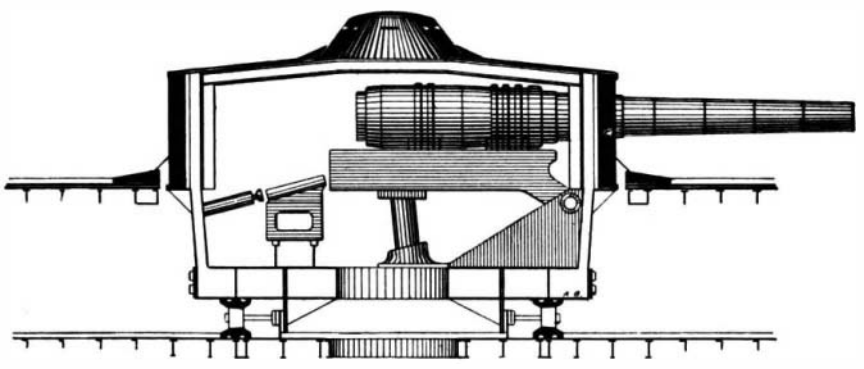
GRIMSRUD'S VEHICLE WHEEL.

must be made between the lower part of the turret and the deck of the ship. More space must also be provided by adding a superstructure, and this, if possible, without reducing the protection of the guns or increasing the weight of the vessel. These conditions required a radical change in the present turrets, and Com. Hichborn found no difficulty in adapting a general design suited to the requirements. It was found that, on account of the simplicity of construction in this new design, the weight saved on the turrets exceeded that of the proposed superstructure, which was therefore erected without increasing the weight. Raising the guns and adding a superstructure naturally raised the center of gravity of the vessel, and this, in the monitors, has been found to be of great value, making them roll easier and giving more steady platforms for serving the guns.

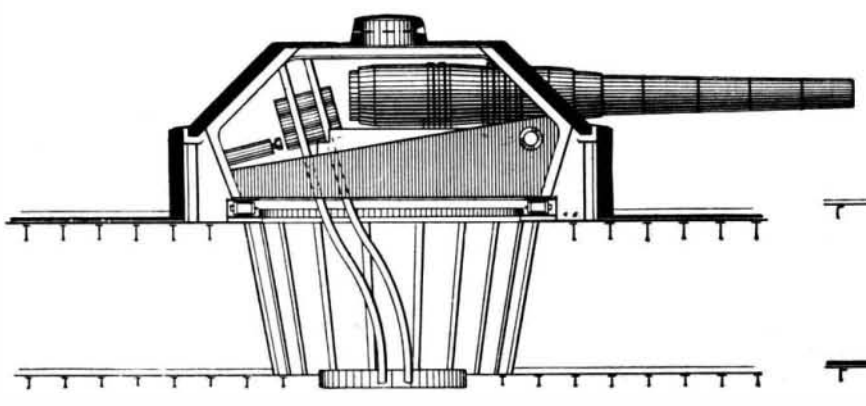
One of the characteristics of the new or "Hichborn" turret, which has been used on all the turreted ships of the navy since its adoption, is that the turret is divided into two parts; a stationary part, fixed to the ship's deck, and forming a circular vertical wall, inclosing the lower portion of the turret proper, and commonly known as the "barbette." It is constructed of steel armor, in some cases more than a foot thick, and extends, in the monitors, some four feet above the deck, forming a water-tight breastwork to that height, and enabling the guns, which are mounted above this, to be fired even when the seas are washing the decks. The upper part, or "turret," rests on rollers within the



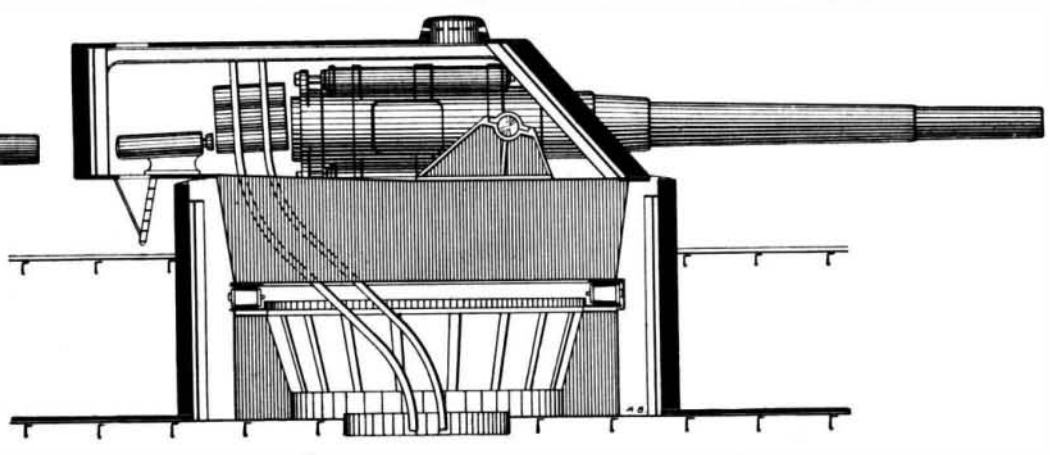
ORIGINAL "ERICSSON" CHEESE-BOX TURRET.



"MIANTONOMOH" TURRET, SHOWING OPENING IN MAIN DECK.



FIRST "HICHBORN" TURRET, WITH SIDES INCLINED.



LATEST "HICHBORN" TURRET, BALANCED, WITH FRONT INCLINED.