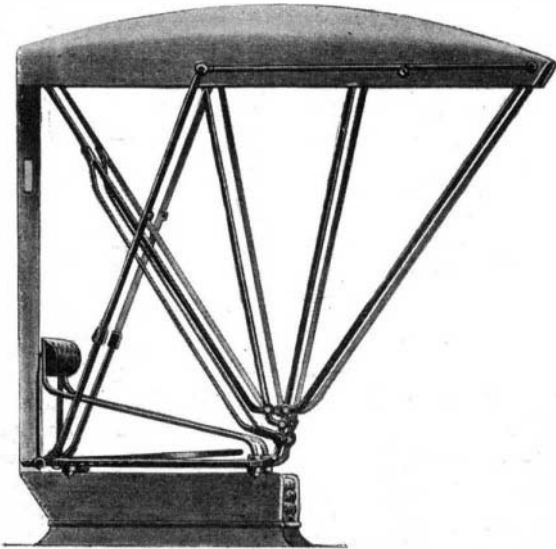


**TILTING ATTACHMENT FOR VEHICLE TOPS.**

The accompanying engraving shows a novel attachment for the foldable tops of vehicles, which may be readily applied thereto, and which affords convenient and reliable means for instantly raising or lowering the foldable top, and for cushioning its descent when quickly lowered, so as to prevent jar or injury to the prop braces, bows, and other parts. Just back of the seat of the vehicle is a rock shaft, which carries a pair of tilting arms at each end. These arms are formed with clasp flanges at their outer ends, which are adapted to engage the prop braces of the



TILTING ATTACHMENT FOR VEHICLE TOPS.

vehicle top. The rock shaft is operated by a lever secured to it near the right-hand end. This lever lies almost horizontal when the buggy top is raised, as shown in the drawing. A pair of spring buffer arms are secured to the side rails of the vehicle seat, and at their upper ends engage the rear bow of the vehicle top. It will be seen that when the operating lever is quickly rocked rearward, and the vehicle top is thrown rapidly into foldable condition, the rearward falling movement of the top will be cushioned by the resilient buffer arms, so that no injuries will result.

It will further be apparent that the clasped engagement of the tilting arms with the side members of the rear bow will stiffen the bow and prevent undue wear at the pivot connections. The buffer arms will also prevent side rattling movement of the bow, and thus co-act with the tilting arms to keep the top from swaying sidewise when in folded condition, which is injurious and quickly loosens the pivot joints of the bows. The operating lever is very conveniently positioned so that the occupant of the vehicle can operate the lever while seated in the vehicle. The device will be found very valuable in case of an emergency, such as a runaway, when it is necessary that the vehicle top be lowered immediately to permit the easy exit of the occupants of the vehicle. Mr. Daniel W. Leonard, Centralia, Wash., is the inventor of this attachment for vehicle tops.

**THE UNARMORED COMPOSITE GUNBOAT "DUBUQUE."**

On July 1, 1902, Congress authorized the building of two armored composite gunboats, which would be of about the same size and general type as the six similar vessels of the "Annapolis" class authorized in 1895, and completed about the time of the Spanish war. The contract for the construction of these two vessels was signed May and July, 1903, and the vessel herewith illustrated, the "Dubuque," was recently launched from the yard of the contractors, the Gas Engine and Power Company, Morris Heights, N. Y. The "Dubuque" is 174 feet long, 35 feet broad, and on her mean draft of 12 feet 3 inches she has a displacement of 1,085 tons. She will be driven by twin-screw vertical triple-expansion engines at an estimated speed of 12 knots an hour. Her boilers will be of the Babcock & Wilcox type, and the engines are designed to indicate 1,000

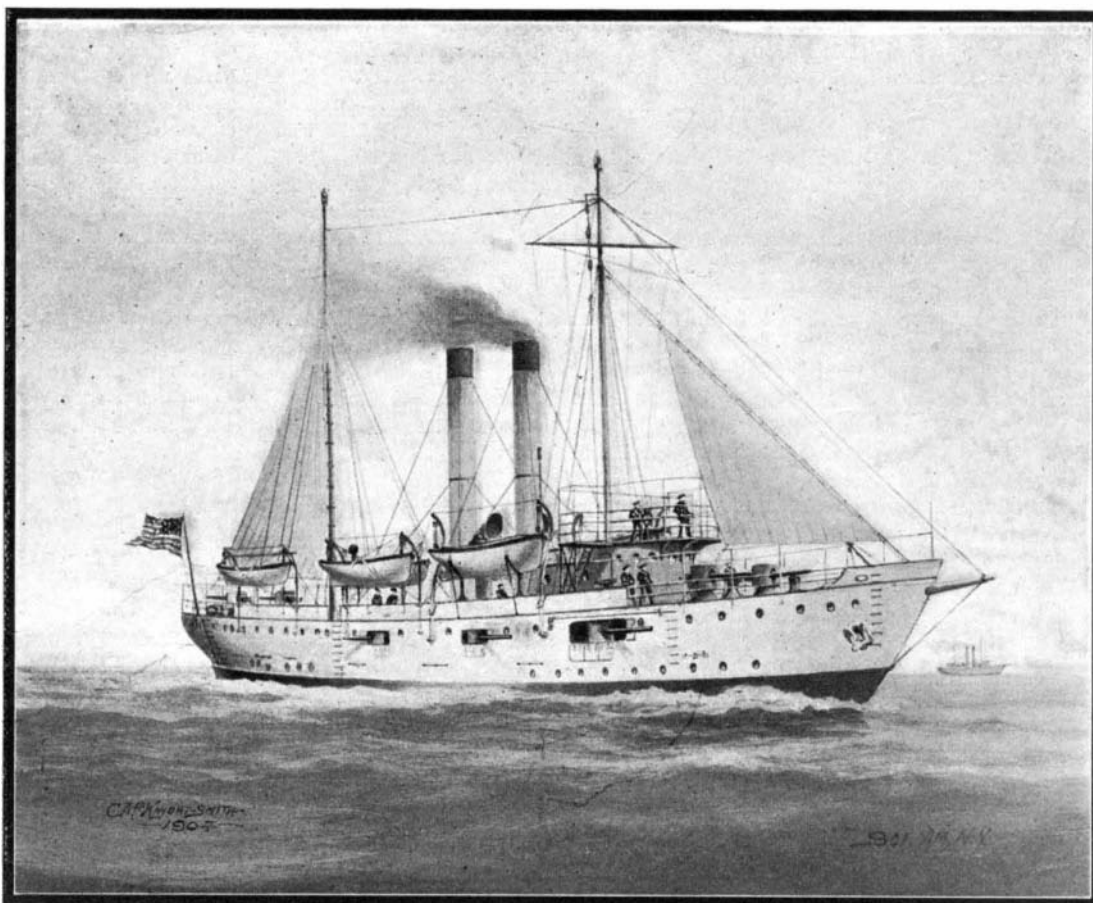
horse-power on trial. The hull is constructed of steel framing and yellow pine bottom planking. All the wood that enters into her construction above the lower deck will be fireproof. Her armament will consist of six 4-inch rapid-fire guns, four 6-pounder rapid-fire guns, two 1-pounder, and two Colts. The distribution of the 4-inch guns is as follows: Forward on the upper deck there will be two guns on center pivot mounting with attached shields, placed abreast of each other; aft, on the same deck, will be another pair, while the other two 4-inch guns will be mounted forward on the gun deck and will fire through casemates. The four 6-pounders will be mounted in broadside on the same deck amidships.

The "Dubuque" will have two smokestacks and will be schooner-rigged with a stump bowsprit, and a signaling yard on the foremast. It cannot be said that these boats have any great pretensions to nautical beauty, the position of the bowsprit, the peculiar form of the bow and the two rather attenuated smokestacks serving to make up a combination that does not commend itself at first glance to the nautical eye. However, these vessels are built for work and not for looks, and no doubt they will prove excellent little sea boats with comfortable accommodations for the officers and crew, and with ample speed and gun power for the police duties which they will be called upon to perform.

**Egg Tests.**

A new and simple method for testing eggs is published in German papers. It is based upon the fact that the air chamber in the flat end of the egg increases with age. If the egg is placed in a saturated solution of common salt it will show an increasing inclination to float with the long axis vertical. A scale is attached to the vessel containing the salt solution so that the inclination of the floating egg toward the horizontal can be measured. In this way the age of the egg can be determined almost to a day. A fresh egg lies in a horizontal position at the bottom of the vessel; an egg from 3 to 5 days old shows an elevation of the flat end, so that its long axis forms an angle of 20 degrees. With an egg 8 days old the angle increases to 45 degrees; with an egg 14 days old to 60 degrees, and with one 3 weeks old to 75 degrees, while an egg a month old floats vertically upon the pointed end.

Although he is president of the Iowa National Bank at Des Moines, H. S. Butler finds time to give his attention to matters of invention, and is the patentee of a number of devices of considerable merit. Mr. Butler says that invention is his recreation. His latest work in this direction is a corn planter, by which the grains are deposited with greater accuracy than with the use of the machines now in use. The grain has a fall of but a few inches, so that it can be placed exactly where it is desired; whereas, with most of the planters in use at present, the fall is much greater, and the grain is more likely to drop to one side or the other. Mr. Butler is also the inventor of a post-hole auger.

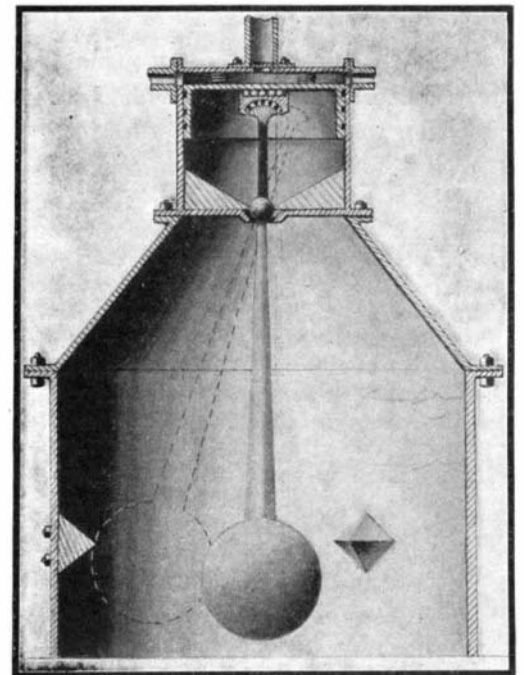


Length, 174 feet. Beam, 35 feet. Draft, 12 feet, 3 inches. Displacement, 1,085 tons. Speed, 12 knots. Armament: Six 4-inch guns; four 6-pounders; two 1-pounders; two Colt's automatic.

UNARMORED COMPOSITE GUNBOAT "DUBUQUE," RECENTLY LAUNCHED AT MORRIS HEIGHTS, NEW YORK.

**PENDULUM POWER.**

An ingenious method of utilizing the roll of a vessel at sea or the swaying motion of a vehicle on land for power purposes is shown in the accompanying illustration. The apparatus used consists of a pendulum so arranged as to operate a piston when oscillated by the motion of the vehicle or vessel on which it is stationed. By this means an air pump or like motor may be actuated. The pendulum swings within a



APPARATUS FOR UTILIZING THE ROLL OF A SHIP.

dome-shaped casing which carries a cylinder at its upper end. In the bottom of the cylinder a spider is secured in which the pendulum has ball-and-socket bearing. This permits the pendulum to swing in any desired direction, and in order to use its motion for actuating the piston in the cylinder the pendulum is provided with an extension arm connected at its upper end by a ball bearing with a plate which, in turn, has ball-bearing connection with the inner face of the piston. When the pendulum swings from its normal vertical position, as shown by dotted lines in the illustration, the piston is caused to move downward either by its own weight or with the assistance of several coil springs, and thereby draws the air into the upper end of the cylinder through a pair of valved inlets. When the pendulum swings back to a central position, the piston is pushed upward, forcing the air out through the central valved outlet into a suitable reservoir or the like, from which the compressed air may be utilized for driving other machinery. In order to prevent the pendulum from swinging around in the casing, a number of projections are arranged in a circle on the inner face of the casing, in alignment with the ball of the pendulum. The projections are preferably pyramidal in shape, so as to insure a proper rebounding of the pendulum ball when it strikes them. Mr. Andrew T. Prather, of 452 16th Street, Douglas, Arizona Territory, has recently secured a patent on this apparatus.

**Radium and the Diamond.**

In the course of some experiments concerning the effect of the emanations from radium upon diamonds, Sir William Crookes made a curious discovery. When a diamond was placed in the path of the radiations it was converted from the carbon crystal into the common form of graphite, while in addition its color was quite changed. As a result of this strange metamorphosis Sir William Crookes suggests that the radium rays may prove of great commercial value to the jeweler since by this means diamonds which are of an indifferent and defective color may be appreciably increased in their commercial value by treatment under the radium rays. He also observed that prolonged action of the radium also increased the intensity of the pale-colored gems.