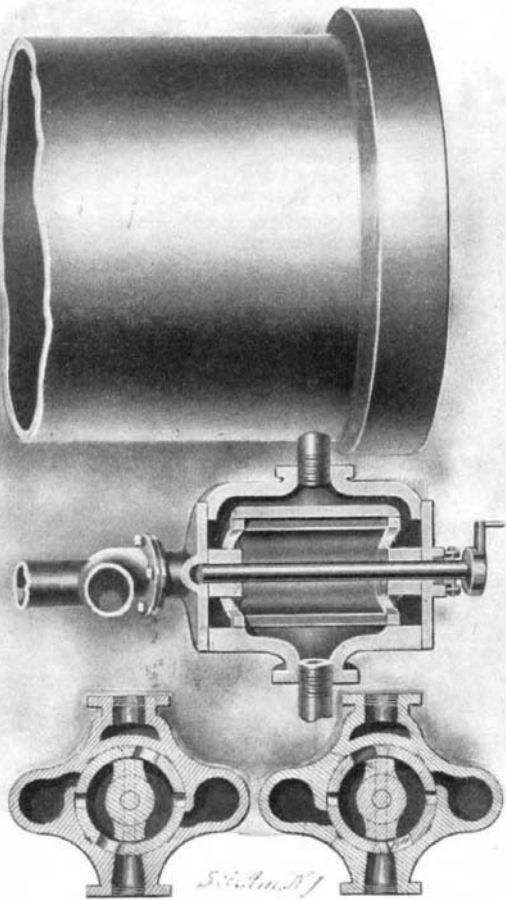


ROTARY VALVE FOR SAWMILLS.

An improved form of rotary valve has recently been invented by Mr. Randolph Gillette, of Little Falls, Minn. This valve is particularly adapted for use on sawmills and embodies means for quickly shutting off the live and exhaust steam at the same time when desired, thus bringing the carriage almost instantly to a stop, and effectually preventing it from running



ROTARY VALVE FOR SAWMILLS.

away. Furthermore, the revoluble valve plug is arranged to prevent unequal expansion and contraction, which would distort it and cause it to bind. In our illustration we show one end of a steam cylinder with the rotary valve attached thereto. A similar valve with the exception of a slightly different arrangement of the ports, as shown in the lower left-hand sectional view, is attached to the opposite end of the steam cylinder. These valves are connected to a common live steam pipe and are also controlled by a common lever. As more clearly shown in the section views, the steam is admitted to two ports in each valve casing, one at each side of the revoluble cylinder plug. A shaft passes through the center of the cylinder plug and on this, at each end of the cylinder, a hub is mounted. To allow for contraction and expansion the cylinder plug is not directly connected to these hubs, but is secured by pins to webs formed thereon. The cylinder plug opens at the ends into steam passages which connect with the steam cylinder above. The exhaust port is shown at the bottom of the casing, and may be connected with the steam cylinder through either of two ports oppositely disposed in the cylinder plug. Similarly the live steam ports may be connected with the steam cylinder by bringing into register with them two ports lying between the exhaust ports in the cylinder plug. It will be observed that the valve may be turned to cut off the steam from the steam cylinder, at the same time opening the exhaust port; or, by further turning the valve in the same direction, or by reverse movement of the valve, both the inlet and exhaust ports will be closed. If a workman finds that he cannot stop the steam feed by operating the controlling lever backward, he may drive it forward, and thus stop the feed, or, if the carriage is moving backward, and he cannot cause the lever to move forward, he can drive the lever backward in the same direction and stop the feed.

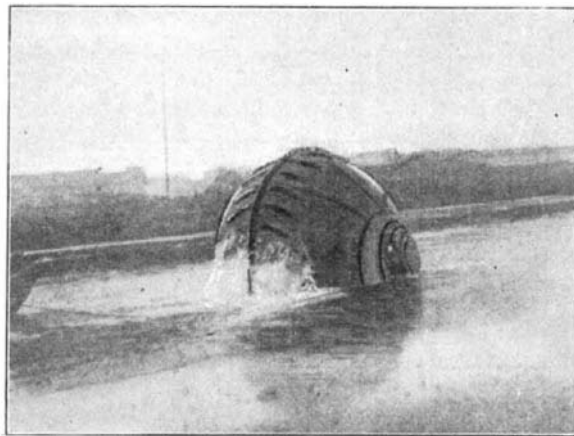
THE ADAM-BOUDIN GLOBULAR BOAT.

Evidently the roller boat idea is hard to kill. The continental papers have been illustrating what is considered a new type of craft which goes by the name of the "Adam-Boudin self-propeller." The boat, from what we have been able to gather, consists of two concentric spheres, the inner of which, containing a 24-horsepower motor, drives the outer sphere. Vanes are provided on the outer sphere, for the purpose, we presume, of securing some kind of a hold on the water. The motor has four speeds and a reversing gear. The inventor has high hopes for his craft. He confidently

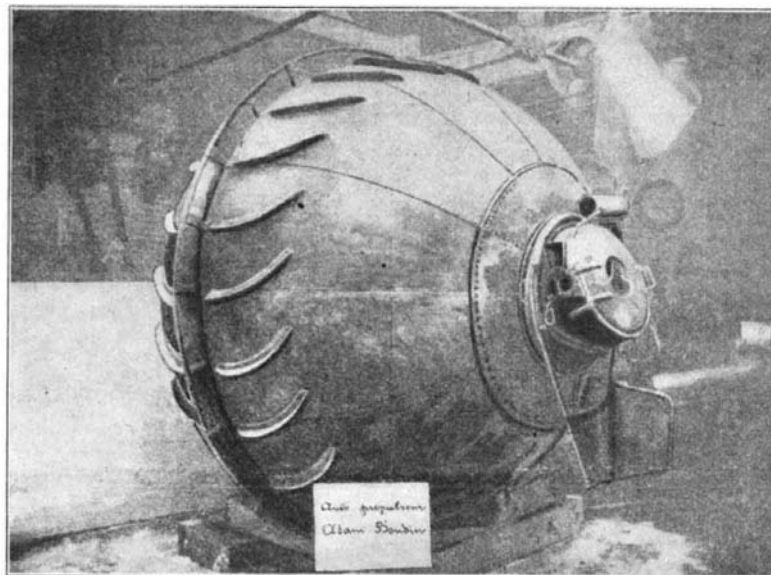
assures the representatives of the foreign press that he will be able to make 50 kilometers (31 miles) an hour with his boat. For our illustrations we are indebted to the London Illustrated News.

How Baby Bats are Nursed.

"Ever since the days of Pliny," writes Mr. R. Lydekker in Knowledge, "it has been a matter of common knowledge that female bats are in the habit of carrying their helpless young about with them during their aerial flights for some time after birth. With the exception of one peculiar species, the young bat always clings to the under surface of its mother's body, where it obtains a secure hold among the dense coat of fur. The precise position in which the young bat supports itself when its parent is in flight does not appear to be recorded. . . . By the older observers it was generally considered that bats commonly produced two young at a birth, as is testified by Pliny, who wrote that the female carried her twin offspring about with her. Later observations, however, led to the conclusion that this idea was erroneous, and that as a rule only one is produced at a birth. . . . The late Dr. G. E. Dobson, in his time the greatest authority on bats noticed that in certain species of fruit-bat: the nipples of the males were much enlarged during the breeding season; and from this circumstance he started an entirely novel idea, which is expressed in the following sentences: 'It is probable that where two young are born at a single birth, the male relieves the female of the charge of one (as the weight of two might render flight difficult or impossible), and at the same time performs the office of a nurse. It is well known that many species of bats have occasionally two young at a birth, but I have never found a mother with more than one clinging to her body. The size of the pectoral teats in many male specimens (though in none yet observed by me so large as in this species and in another case referred to above) led me to think that instances of the male performing the office of nurse are probably not uncommon among bats.' Whether this suggestion is true of fruit-bats must be left for future observation to determine; but it is now practically certain that it will not hold good for the ordinary insectivorous bats; although, so far as I know, no case has hitherto been recorded where a female of any of the European species of bats has been actually seen carrying about her twin offspring. The interest that would attach to a well-authenticated instance of this nature may be commended to the attention of the readers of Knowledge. If, however, instances of female bats carrying more



The Boat Entering the Water.



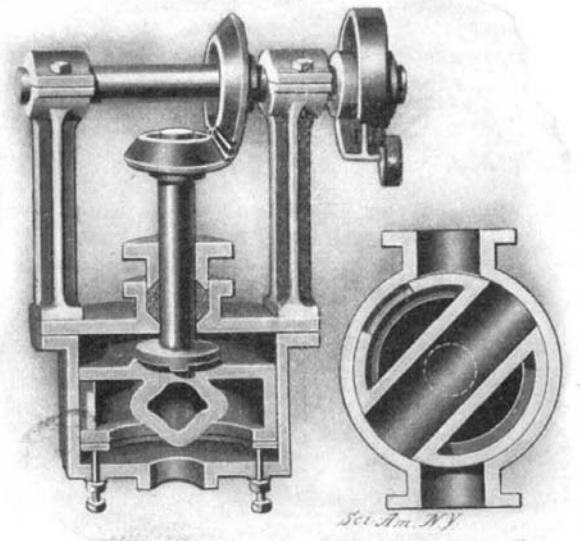
The Boat on Shore.

A GLOBULAR VESSEL.

than one baby offspring clinging to their bodies are unknown in Europe, they have recently been brought to light in America. And in these instances not only has the parent bat been seen loaded with the weight of twins, but actually with that of a quartette."

VALVE FOR CONTROL OF HYDRAULIC ELEVATORS.

A patent has recently been granted to Mr. Joseph Utrilla, of 205 Second Street, Jersey City, N. J., for an improved form of valve particularly adapted for use in controlling the motive agent for hydraulic or similar elevators. The valve is very simply constructed and may be readily and quickly operated. A perspective view of the valve in section and the gear-



VALVE FOR HYDRAULIC ELEVATORS.

ing by which it is operated is shown herewith, also a transverse section taken through the center of the valve. By comparing these two views the simple construction will be readily understood. The valve proper consists of a drum with a large opening at the bottom, and a smaller opening at one side. Passing transversely through the drum is a tubular port of oval cross section, which is designed to communicate with inlet and outlet ports in the side walls of the valve casing. The valve proper rests upon a wear ring in the bottom of the casing, and extending upward from the valve through a stuffing box on the top wall of the casing is a valve stem having a segmental bevel pinion on its end engaging with a segmental bevel gear on a shaft supported in bearings attached to the valve casing. Mounted on this shaft is a cable wheel by which the valve is operated. A counter-weight is attached to the cable wheel for automatically moving the valve to closed position upon releasing the cable pressure. In operation, when the valve lies in such position as to bring the tubular port in line with the ports in the valve casing, pressure is admitted to move the elevator upward. By moving the valve through an angle of 45 degrees the tubular port is thrown out of register with the ports in the side walls of the valve casing, as shown in the transverse-section view, and the pressure is thus cut off and the elevator stopped. To cause downward movement of the elevator the valve is turned through a further angle of 45 degrees, bringing the port in the side wall of the valve drum into communication with the outlet port of the valve casing, thus permitting the water or other motive agent to pass back through the outlet port, and thence through the ports in the side wall and the bottom of the valve drum and out through the port in the bottom of the valve casing. It will be noted that the whole movement of the valve is in the space of 90 degrees; therefore, it may be quickly operated in both directions.

The "blue ground" in which diamonds are found at the Be Beers and Kimberley mines is called by Dr. Stelzner a "breccia." Most of the angular-edged or rounded fragments of this breccia are composed of a green-black or blue-black serpentine-like mass. Fragments of rock which are found in Karoo formation—such as sandstone, shale, and diabase—are to be found in the "blue ground." There are also other rocks, in the shape of boulders, which are not known in the Karoo formation, and which doubtless come from a greater depth, possibly from the rocks upon which the Karoo beds lie. The mass of the "blue ground" consists of olivine, more or less changed by oxidation, with the following minerals: Chromic diallage, bronzite, pyrope containing chromium, flesh-colored zircons (locally called Dutch bort), cyanite, biotite, chromite, titanium, magnetic iron, and, finally, small crystals of perovskite.—The Engineering Record.