

IMPROVED MARINE ENGINE GOVERNOR.

This invention relates to improvements in marine engine governors for the purpose of automatically regulating the speed of the propeller or other driving wheel, as well as that of the engine, when the vessel is exposed to rough seas, in which the propelling wheel is often raised, partly or wholly, out of the water. When this occurs in steam vessels not provided with proper automatic governors, the speed of the engine is dangerously increased if not checked in time by the engineer in charge, causing serious damages to engine shaft and propeller.

The present device is designed to obviate the difficulty, and, unlike most governors for this purpose, it anticipates the movements of the engine, preventing racing and the breaking of the screw blades on their sudden descent into the water. It is also claimed to regulate the engine according as the screw is more or less submerged, a few inches rise or fall of the vessel being sufficient to affect the apparatus.

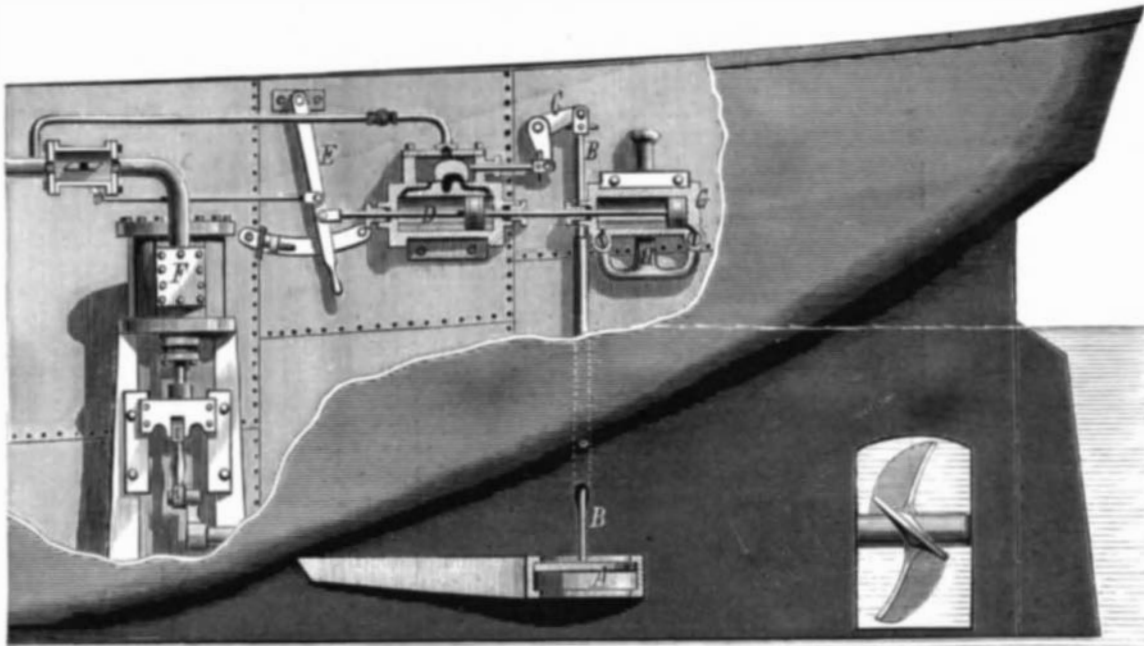
This invention is constructed as follows: A float, A, is movable in a suitable box, which is situated on the side of the keel but not below it, and about 25 feet forward from the propeller. This box is open in its upper and lower ends so as to allow free access of the sea to the upper and under sides of the float, by which the said float is moved in the box upward and downward, as the propeller is lowered and raised, or, more properly, the float remains stationary in the water during the rise and fall of the open-mouthed box. The latter is provided in its upper and lower ends with an annular flange or stop, so as to prevent the float from ever getting out. To the float is secured an upwardly projecting rod, B, that passes through a tube, and is jointed at its upper end to a knee lever, C, movable around a fulcrum. The other end of said knee lever is jointed to a valve rod that actuates a valve in connection with a small intermediate steam cylinder, D. The forward end of the piston rod of the cylinder is jointed to the ordinary throttle lever, E, or directly to the throttle valve rod if quicker action is desired; said lever is jointed to a throttle valve governing the admission of steam from the main steam pipe to the ordinary valve chest of the steam cylinder, F, of the engine. The small intermediate steam cylinder receives its steam through a pipe leading from the boiler or main steam pipe, and is regulated by a suitable cut-off, or the piston of said cylinder may be actuated by air or gas pressure. The arrangement, as above described, would, in many cases, be sufficient; but, to prevent a too sudden opening and closing of the throttle valve by the fall and rise of the float, in connection with the intermediate steam cylinder aforesaid, there is a pump cylinder, G, the piston rod of which forms an extension of the piston rod of the former, and is movable through stuffing boxes in the usual way. From each end of said pump cylinder leads a small pipe to a stand pipe, H, containing water or other suitable liquid. To allow the liquid to escape gradually from the cylinder through the pipe at each end, there is located a suitable valve or cut-off by which the exit area of the liquid can be effectually controlled and regulated, by which the action of the piston of the intermediate steam cylinder is retarded.

The liquid in the stand pipe is used over and over again, and only a little is wasted by evaporation or leakage. The operation of this invention is as follows: As the propeller rises upwards, more or less, the float, A, remains stationary till it reaches the lower projection of the open box, which latter moves upward with the vessel and its propeller, and in doing so the rod, B, is moved downward, by which the knee lever, C, is turned around its fulcrum, and thus pushing the valve rod forward lets the steam into the back end of the intermediate steam cylinder, D, of which the piston rod is moved forward. As the latter is connected to the throttle lever, E, it will be seen that the steam is automatically cut off from the main cylinder, F, by the throttle valve; and the lever coming in contact with a set

screw can be adjusted to give the valve any desired opening to keep the propeller in a slow motion without letting the engine stop on its center. Now when the piston of the intermediate cylinder, D, moves forward, as described, the pump piston in G must also move forward at the same time, as it is connected to the former by the continuous rod, and the water in the pump cylinder that is before the piston can be expelled therefrom only as fast as it can pass through the small pipe and its valve or cut-off, and thus it will be seen that the speed of closing the throttle valve is easily regulated by opening or closing the valves or cut-offs leading to the stand pipe, H, more or less as may be desired.

large middle opening, through which the main shaft passes, and in which is an eccentric, C, for working them, said eccentric acts upon bearing pieces, D, pivoted and provided with adjusting screws, E, to take up the wear. The hammer bars are of wood and are pivoted to a wooden cap mounted on a metal frame. The end plates, F, and also the bottom plates, G, are of non-corrosive metal, and the side plates, H, which may be readily changed, are of wood.

We are informed that this mill has been in successful use for two years past. Patented through the Scientific American Patent Agency, April 4, 1876. For further particulars address the inventor, Mr. Joel M. Baldwin, Evans Mills, Jefferson county, N. Y.

**FOWLE'S MARINE ENGINE GOVERNOR.**

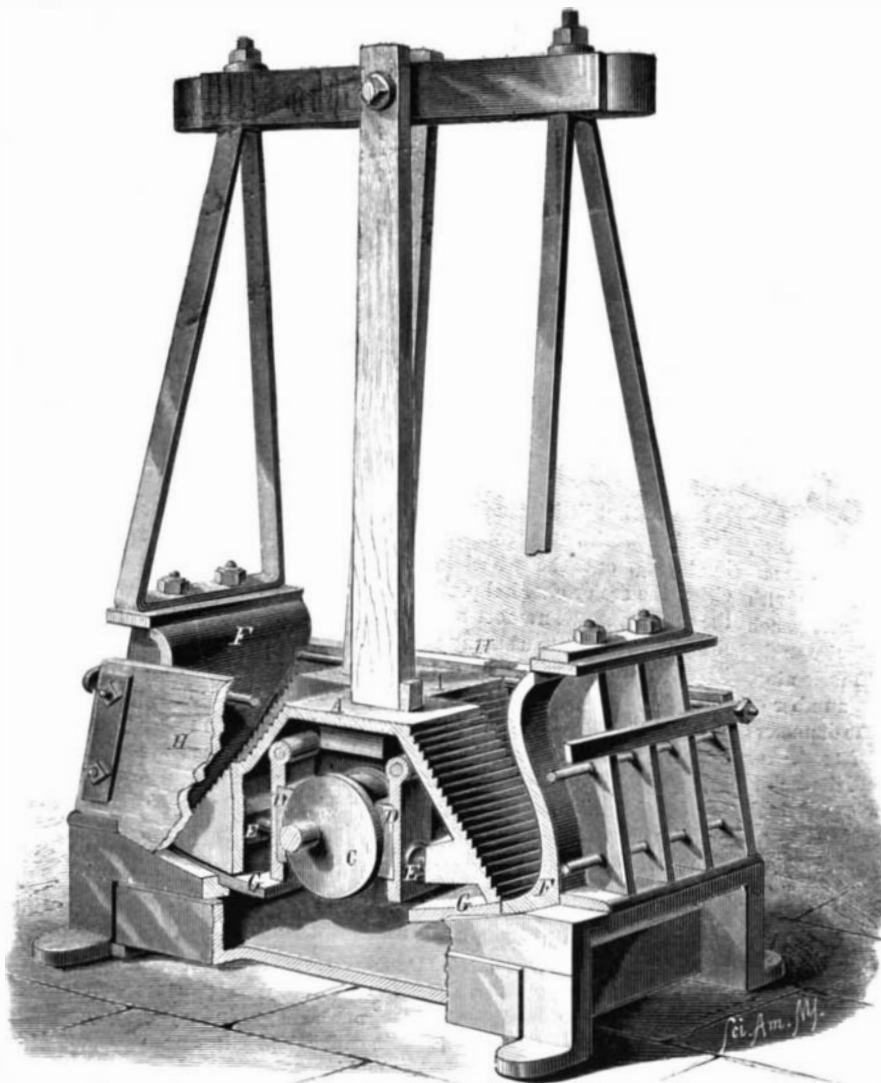
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IMPROVED FULLING MILL.

The advantages of the new construction of fulling mill herewith illustrated, over the ordinary crank and pitman arrangement or falling stock mill, are claimed to be that space is economized, that the mill can be run faster, and that it can be located above the floor without inconvenience. The box and frame are also constructed partially of metal, and thus rendered stronger.

The hammer heads, A, are constructed of metal with a

bad and discolored seed is washed and otherwise fixed to look fresh and good. One enterprising German firm, *Iron* says, actually offered in English markets a lot of common sand, which had been treated so that the angles were rubbed off, then dyed, and in short most ingeniously fixed to imitate clover seed. Mr. Henry Bessemer is credited with the suggestion of sprinkling suspected seed on a wet towel and noting what percentage germinates, as a means of testing whether the seed be good or not. Apart from its extreme age, it would be supposed that this idea would occur to any one of average intelligence, without waiting for Mr Bessemer to revamp it.

**BALDWIN'S IMPROVED FULLING MILL.**

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An Exposition for the Boys.

The Juvenile Industrial Exhibition which it is proposed to hold next year at Ballarat, Australia, under the auspices of the Government of Victoria, seems to us to be worthy of imitation here. It is to be a grand show gotten up with all the paraphernalia of International Exhibitions, but its exhibitors must be under 21 years, or else apprentices not out of their indentures, whatever their age. There are 24 classes covering all kinds of exhibits from machinery to poems, and special prizes are announced. It would be an excellent plan to undertake something of the kind here. To make it a national affair would of course render it too ponderous, but such a show might easily be carried out in a single State. The boys often do capital work, and they get little public encouragement, as they are usually employed under other people who absorb the glory to themselves. The boys can invent besides and well, for many have come to this office as applicants for patents. We know also that the SCIENTIFIC AMERICAN finds some of its staunchest supporters and steadiest subscribers among the youngsters. Let us have expositions of what the boys and girls can do, to be held say next summer. It would be a capital winter's work to organize these shows in every township, county or State.

PROFESSOR J. H. KERR, of Colorado College (at Colorado Springs), has discovered some fossils of unusual size in the locality known as the Garden of the Gods, at the foot of Pike's Peak. The length of one of the animals whose remains have been found is estimated at 117 feet. The formation is cretaceous, the bones are easily broken, and the animal figures are in part represented by casts.