

**FIRELESS MINING LOCOMOTIVE.**

This locomotive was designed by Mr. R. Riedel, and constructed by the Hallesche Maschinen-Fabrik, Halle, for the Wilhelm Adolf lignite mines at Lebendorf, where in a working of very small dimensions it draws twelve coal trucks, weighing 1,500 pounds each, at the rate of about 7 miles an hour. The total height of the engine is only 4 feet 6 inches, the width over all 3 feet 7½ inches, while the length, including a seat for the driver in a somewhat cramped position, is only 11 feet 5¼ inches. The four wheels, 15¼ inches in diameter, are coupled. The wheel gauge is 18½ inches, and the cylinders have 5½ inches diameter and 7⅞ in. stroke. The above figures will show how economical the designer was obliged to be when proportioning his locomotive, in consequence of the very limited space at his disposal. The dimensions of the tunnel in which the locomotive works are 4 feet 8¼ inches in height and 4 feet 2¼ inches in width, leaving but about 2 inches between top of engine and roof of tunnel.

The boiler of the locomotive is constructed on the Honigmann principle, in which the exhaust steam is condensed by a concentrated soda solution, and the heat thus obtained is reused for the evaporation of water. The cycle starts with a high temperature of both water and soda solution, and after the latter has been so far diluted by the condensed water as not to be able to evaporate any more water, the concentration of the lye is effected by steam passed in the water space of the locomotive boiler from a stationary boiler on the works, in which a pressure of 175 pounds is maintained. With this arrangement no other machinery or boilers are necessary in the mine, and the inconvenient operation hitherto required of emptying and refilling the boiler of soda lye has also been abolished.

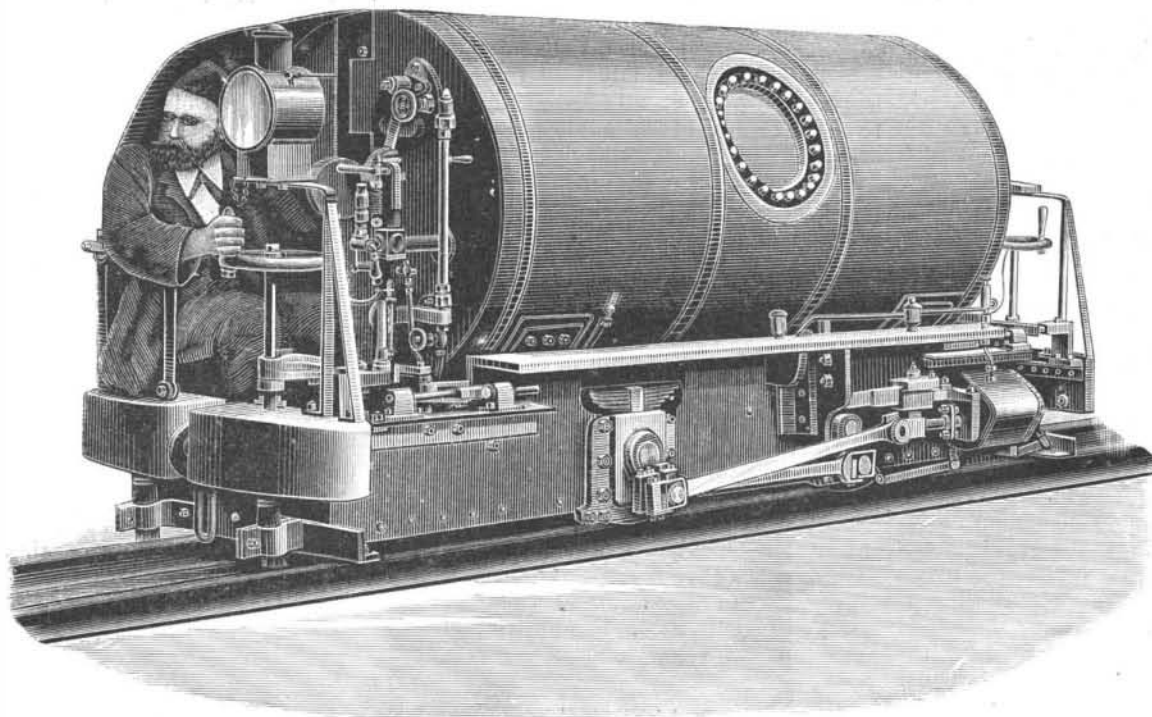
In the case of this particular mine, a considerable saving has been effected in consequence of the use of steam power in place of manual power, but it would have been impossible by any other method save the Honigmann soda boiler, which emits neither steam nor smoke, and it is to be hoped that this system will be more widely introduced into mines, where its application is particularly desirable.—*Engineering.*

**LIGHT DRAUGHT STEAM LAUNCHES.**

There has been a great increase in the use of small steam launches within a few years past, with a proportionate demand for such improvements in their construction as will render them easily manageable by a n d s a f e with amateurs. For this purpose they have needed to be very strongly built for such light boats, and it was indispensable that their machinery should not be at all complicated. A boat of this description, of great power and capacity for its size, and which has proved a great success during the past year, is shown in the accompanying illustration, and is manufactured by Messrs. H. B. Williams & Co., of Rochester, N. Y. Its distinguishing feature

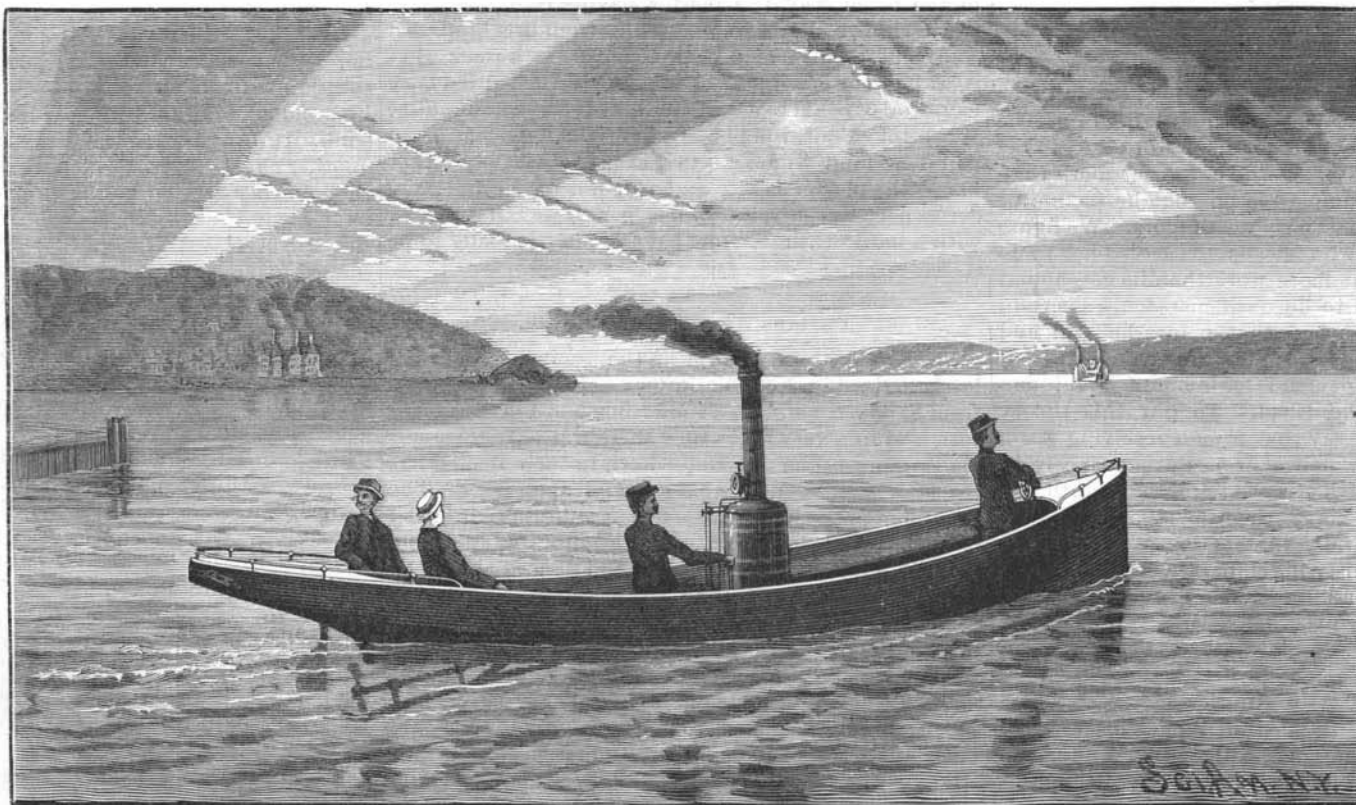
is a patented automatic skag, hinged to the keel near the rear of the boat, in such a way as to allow the propeller shaft and itself to move upward through a well, and bring all the working parts entirely out of danger, when the boat passes over obstructions or through shoal water. In deep water the pro-

PELLER has its full diameter submerged, but as the boat enters shallow water the skag commences to feel bottom, and gradually works itself upward, the wheel still revolving, thus also passing over snags and other obstructions as long as there is water enough under the keel to float. A boat, 70 ft. long and 15 ft. broad, built on this principle, has done considerable excursion business the past summer on the Genesee River, carrying 350 to 400 passengers at a time, and running over the snags and

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shoals in the upper portion of that stream without any trouble. The engine of this boat is 8 in. stroke and 7½ in. diameter of cylinder, with direct-acting propeller. The boat draws only 8 inches of water with 250 people on board, and can make ten miles per hour without forcing, the machinery taking up but a small fraction of the room and consuming far less fuel than usual with other styles of boats of similar capacity.

The firm make a variety of styles of boats, all of light draught for their proportionate carrying capacity, of graceful appearance and fine finish, and calculated to attain a higher rate of speed than has heretofore been generally sought in such craft. With this purpose they have given particular attention to their build of engines and boilers, their No. 1 pattern occupying a space of only 16 in. in width by 24 in. in length, and sitting directly on the bottom of the boat. Either hard or soft coal or wood is used for fuel, and the boiler is of steel, without rivets. The firm, besides their marine boilers, also make others for manufacturing purposes, especially in one, two, and six horse powers.

**IMPORTANCE OF SOFT WATER FOR DOMESTIC****H. B. WILLIAMS & CO'S LIGHT DRAUGHT STEAM LAUNCH, WITH AUTOMATIC SKAG.**

**PURPOSES.**—The importance of soft water for domestic purposes is illustrated by the experience of a large London asylum, in which a change from hard to soft water has resulted in an estimated annual saving in soda, soap, labor, etc., of more than four thousand dollars.

intentions, to be made to exhibitors. Communications should be addressed to Charles H. Seligman, Esq., of Glasgow.

**FORESTS** cover twenty-four per cent of the entire area of Norway

**Fishing by the Electric Light.**

Some interesting experiments in connection with the subject of fishing, the *Scotsman* states, have been carried on in the Firth of Forth. It has long been understood that fish are strongly attracted toward any bright light—a fact utilized by the salmon night fisher, who uses a flaming pine torch to bring the prey within reach of his "leister" or spear; and it is proposed under this system to employ, by way of lure, the powerful light of the electric lamp. A number of gentlemen having obtained the use of the steamship Tweeddale, have had her completely fitted out for the purpose with electric apparatus, engine, and dynamo, arc lamps of 6,000 candle power, incandescent submarine lamps, etc.

Recently the vessel, thus equipped, was engaged in her novel fishing cruise in the neighborhood of the Isle of May. The experiments, however, have not so far been successful. The electric lamps were sunk with the beam of the net to a depth of 40 or 50 fathoms, the glass globe being about three-eighths of an inch thick. Operations were carried on for about an hour on two occasions, and it was found that the pressure of the water was too great for the strength of the glass, the result being that the lamps broke, and the light instantly went out. It is intended to renew the experiments, using strong glass.

**The International Exhibition of Glasgow, in the Year 1888.**

An international exhibition of industry, science, and art is to be held in Glasgow, Scotland, extending from May to October, 1888. The usual patronage of Queen Victoria, the Prince of Wales, and other notabilities is cited in the prospectus. A guarantee fund of over 250,000 pounds sterling has already been subscribed. For the exhibition buildings a site of over 60 acres area has been granted by the city of Glasgow. There is every prospect of the exhibition being a great success. The grounds are intersected by the river Kelvin, 90 feet wide, 86 feet deep. This stream, it is suggested, may be utilized for marine exhibits. The general plan of the display includes 22 classes, covering every kind of product. In addition to these, there are two divisions of special interest. One is the women's industries sections, the other the artisan section. For these and for the fine arts section no charge for floor space will be made. The list of regulations for exhibitors seems

very well conceived, and imposes no annoying restrictions. The council believe that the simple exhibition of the articles in so important a center as Glasgow should be a sufficient incentive to secure large contributions from all parts of the world. There is no reason to believe otherwise. The city and its suburbs represent 1,500,000 people of a great manufacturing center. A peculiarly favorable opportunity appears to be offered to American manufacturers to introduce their work to the great markets of Scotland and England. No awards are, according to present