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STEAM HAND CAR--MINIATURE RAILROAD TRAIN.

A new steam hand car has recently been designed and constructed by Mr. Jay Noble, master mechanic for M. M. Buck & Co., of St. Louis, Mo., which is excellently adapted for the use of division superintendents, road masters, and others whose duty requires them to make frequent inspection of railway lines. The machine, as shown in the engraving, resembles an ordinary hand car, except that the propelling power is steam and not muscle. The floor is about 10 inches from the ground, and is beneath instead of above the axles. The boiler, which is about 3½ feet in hight with a diameter of 18 inches, is placed in the center of the car, while the cylinder, which is horizontal, is at the right hand side and near the floor. The cylinder is 3½x6 inches, and the boiler is intended to carry a pressure of 140 lbs. of steam. The body of the vehicle rests on rubber springs and rides very easily without lateral motion.

Seats are arranged in front and rear, of sufficient size to accommodate six persons. The water tank occupies a space under the back seat and holds about a barrel of water, which is sufficient to run the car 40 miles. On the left of the boiler, the coal pan is arranged in a space about 2 feet wide, and carries all the fuel necessary for a day's run.

On a recent trial trip, the run from St. Louis to Carondelet, a distance of seven miles, was made in fifteen minutes. The general design of the car, which is quite tasteful and at the same time well adapted to withstand severe usage, is plainly represented in our illustration. The idea developed in this miniature steam car might be adapted to other purposes than the one designated. We should think every railroad company would find such a steam car useful for various purposes.

STEAM HAND CAR.

The inventor states that under ordinary circumstances the cost of fuel will not exceed 75 cents per day. The general arrangement is excellent and reflects much credit on the designer.

Professor Bottger's Experiments with the Radiometer.

The much-talked-of radiometer, which Professor Crookes believes to be set in motion by the mechanical action of light, has fallen into the hands of that skillful experimenter, Professor Rudolph Böttger, editor of the *Polytechnisches Notizblatt*, at Frankfort on Main. In a communication to the Berlin Chemical Society, he described some of these interesting experiments. The radiometer employed by Dr. Böttger was made by Geissler in Bonn. The plates attached to the revolving arms were made of mica, rendered white by heating, and blackened on one side. This instrument was provided with a leaden foot to cause it to float upright in water.

When this little instrument was exposed to the direct light of the full moon, or to the light of strongly phosphorescent Geissler tubes which have been illuminated by burning magnesium wire, the arms do not show the slightest motion. If the apparatus is placed at a distance of 10 inches from a bright luminous gas flame, and a clear plate of alum 0·2 inch thick fastened in the center of a pasteboard screen be interposed between them at the same hight, there will be but a very slight revolution of the arms, showing that the easier radiation of heat by the blackened side of the mica plates than by the bright side, in a space which is not an absolute vacuum, although ever so rarefied. Dr. Bottger compares it to the Segner water wheel.

If the radiometer is taken into a room where the temperature is about 15° C. (59° Fah.) and placed near a luminous gas flame, the arms revolve from right to left, that is, with the bright side of the mica in front. While the arms were still in motion, this little instrument, with its leaden foot, was placed in a glass cylinder filled with water at 45° C. (113° Fah.) so that it was entirely immersed; the motion of the wheel was retarded, it stopped, then began to turn in an opposite direction, namely, from left to right, the blackened side of the mica being in front. In a short time, when the glass bulb and its contents had acquired the temperature of the surrounding water, the wheel came to rest.

Dr. Bottger repeated these experiments with a radiometer made by Mollenkopf of Stuttgart, and with somewhat different results. When this instrument was placed in warm water while in motion, it did not change its direction of revolution like that from Bonn.

If both instruments are set in motion by a feeble light and ether allowed to drop on them, causing quite a decrease in temperature, no retardation was observed in the apparatus from Stuttgart, while in that from Bonn the motion of the arms was strikingly slower. The experimenter thinks it probable that this difference in the action of two apparently identical apparatus was due to the vacuum being more perfect in one than in the other.

It would be interesting to make some experiments with an instrument where both sides of the mica or aluminum plates are blackened, also where both are bright. Such an instrument should be motionless when exposed to the action of radiant heat.

The Intercollegiate Boat Race.

The intercollegiate boat races took place at Saratoga, on July 19, and were all won by the Cornell University crews. The University race, in which Cornell, Harvard, Columbia, Union, Wesleyan, and Princeton colleges competed, was gained by Cornell in 17 minutes 1½ seconds—distance three miles. The freshman race, against Harvard only, was won in 17 minutes 23½ seconds, and the single scull race in 13 minutes and 42 seconds. The time is not considered remarkable, but the victory was fairly gained; and coming, as it does, in direct succession to the honors won by Cornell last year, it will secure for the students of that college the highest reputation for athletic culture.

We have already expressed our opinion relative to races of this kind, and need not repeat it here. It may be noted, however, that there were fewer cases of fainting or other signs of physical overwork observable during the races which have just taken place, than appeared last year. As the men were all tried hands at the oar, many having rowed in other trials, their experience then gained, doubtless, prevented any over exertion, a fact indicated by the time made.

Public interest in these races seems to have greatly decreased, the attendance having considerably fallen off this year, and it is considered doubtful whether another large regatta will soon again occur.

An Asbestos Exposition.

An interesting exposition of asbestos has recently been held at the Simonetti Palace in Rome, the material being exhibited under all forms, from the crude state as mined to its highest industrial preparations. The *Gaceta Industrial* states that there were samples of thread made from the mineral which were stronger than the best English cotton; cloth, from coarse bagging to a fabric as fine as linen; paper for writing, printing, and sheathing buildings, and pasteboard. The asbestos paper is made at Tivoli, Italy, and costs about 40 cents per lb. It is especially useful for important documents which it is desired to preserve from fire. To test the fireproof qualities of the pasteboard, a case made therefrom was filled with ordinary paper, another case of pasteboard, not containing asbestos but otherwise exactly similar, was likewise filled, and both were thrown into a fire. In the space of five minutes the unprepared pasteboard box and its contents were wholly consumed, while to that period the asbestos box remained uninjured. Nearly all the asbestos mined in Italy finds its market in the United States.

Naval Items.

On July 19, Passed Assistant Engineer C. J. Habighorst was ordered to the Powhattan on August 1 next, and ordered to report to the Superintendent of the Naval Academy at Annapolis, Md., on August 20, for duty as an instructor in the department of steam engineering.

The Board for the examination of candidates for admission and promotion in the engineer corps, lately in session at the navy yard, League Island, has adjourned until September 1.