

RICHARD'S REGISTERING BAROMETER.

This instrument is provided with a series of superposed vacuum shells or drums, similar to those of aneroid barometers, which are screwed together at their centers. They are each furnished with an internal curved spring to resist the atmospheric pressure. These drums are distended or flattened under this pressure, and their motion is transmitted to a large needle by a very simple system of levers. This needle carries at its extremity a metallic pen of special form, containing a certain quantity of ink whose base is glycerine.

A cylinder carrying a barometric scale revolves in front of the pen, and in light contact with it. The cylinder makes a revolution in a given time, a week in the present instance. The pen is made to rise and descend by the dilatation and contraction of the drums of the barometer, leaving an interrupted tracing upon the paper. In this manner a diagram of barometric height is obtained, the reading of which is rendered easy by the arrangement of the barometric scale.

The rotating motion of the cylinder is obtained in this instrument in an entirely novel manner. The clockwork, instead of being fixed and communicating motion to the cylinder by gearing, is placed inside the cylinder and moves with it, and is revolved by means of a pinion projecting outward; the pinion has an epicycloid movement around a fixed wheel, placed upon the frame of the instrument.

Every week the observer changes the paper upon the cylinder, puts a little ink in the pen, winds up the clock movement, and the apparatus will work for another week without being touched.

The same system is applied to thermometers and hygrometers. The motive power of the pen is the only change that has to be made.

The indications of this instrument are exact, it is convenient to use, the operation of setting it in motion and of changing the paper may be accomplished in a few seconds and without any difficulty, and the pen will record for a month if necessary without being touched.—*Gaston Tissandier, in La Nature.*

REVERSIBLE TOOLS.

The engraving shows an improvement in the class of tools in which the bit or working part of the tool is pivoted in a forked handle and has two working ends, either of which may be used by turning it on its pivot in the handle.

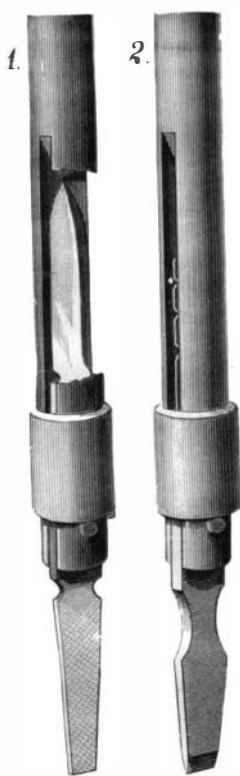


Fig. 1 shows a bit of steel having on one end a pen-knife and on the other a file. Fig. 2 shows a combined gimlet, bit, and screwdriver. These tools are held in position in the handle by the ferrule. When it is desired to reverse them the ferrule is moved upward on the handle.

This invention has been patented by Mr. W. A. Wales, of Newton, Mass.

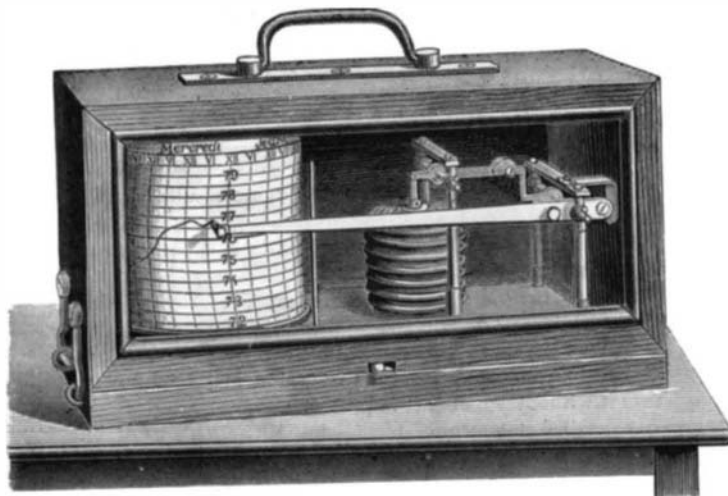
Oxygen Gas Works, Paris.

The question of the economical production of oxygen has much occupied the ingenuity of chemists. According to the *Revue Industrielle*, this problem is now in a fair way of being solved. There is at present in Paris an oxygen gas works which is capable of supplying nearly 11,000 cubic feet of oxygen daily. This is, of course, a small beginning; but it is a great advance from the scale of laboratory production to which this gas has long been confined. No details are yet available concerning the process adopted in the manufactory, nor is the lowest selling price stated. The cost is, however, said to be moderate, and capable of reduction if the gas is largely consumed. Our contemporary remarks on the importance of this subject, as a cheap supply of remarkably pure oxygen, such as is said to be that produced at the new establishment, will probably exercise a very considerable influence on the question of lighting as well as on the progress of metallurgy and practical chemistry. The gas as sold in Paris from this first factory on the new system is said to be very cheap, although the works may be considered somewhat as of an experiment. The most important thing about the present announcement is the fact that, under any circumstances, the production of good and cheap oxygen in abundant quantity is established.

Close Writing.

A German having "written" on a postal card an incredible number of words (25,000, we believe) in a style of stenography used in Germany, the author of the system set up the claim that it was superior to any other in use. The claim was disputed by the disciples of Pitman in England, and a prize was offered for the largest number of words

written in Pitman's style on an English post card, the writing to be legible to the naked eye. The card of the winner, Mr. G. H. Davidson, is said to have contained 32,363 words, including the whole of Goldsmith's "She Stoops to Conquer," an essay on John Morley, and half of Holcroft's "Road to Ruin." It will be understood that probably not one of all these words was *written*, that is, had all its sounds

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expressed or even indicated. Such shorthand hints at words, but does not write them.

NEW GAME COUNTER.

The engraving shows a novel game counter which may be let into the top of the cushion rail of a billiard table, and is operated by a knob or handle at the side of the table.

The registering mechanism is much like that used in engine and other speed counters; the units wheel is provided with a single tooth, which, at every revolution, engages the tens wheel and moves it forward one place. The units wheel receives its motion from a vertical spindle, which, in turn, is actuated through miter gearing by a horizontal spindle having at its outer end a milled knob and at its inner end a notched wheel, which is engaged by a detent spring retaining the numbers in the dial aperture in the proper position or bringing them into that position after the hand is removed from the knob.

The apertured plate through which the figures are seen is formed so as to answer as one of the angle sights usually connected with the cushion rail.

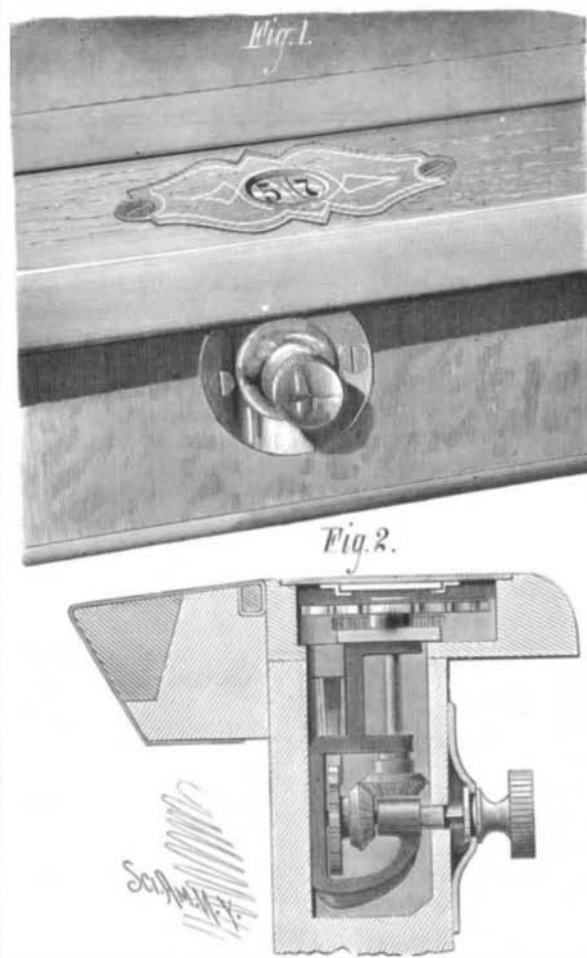
**COLLENDER'S GAME COUNTER FOR BILLIARD TABLES.**

Fig. 1 represents the device in perspective, and Fig. 2 is a vertical section showing internal parts.

This invention was lately patented by Mr. H. W. Collender, the well known billiard table manufacturer of 788 Broadway, New York city.

The Longest Span of Wire.

The longest span of telegraph wire in the world is stretched across the Kistnah River from hill to hill, each hill being 1,200 feet high, between Bezorah and Sectanagrum, in India. The span is a little over 6,000 feet in length. The only mechanical contrivance used in stretching this cable across the river was a common windlass.

ENGINEERING INVENTIONS.

An improved car coupling has been patented by Mr. Thomas Noble, of Todd's Point, Ill. This invention relates to that class of couplers that are self-couplers; and it consists of a coupling link having a rack prolongation which is entered into the draw head and operated by a pinion, and of a swinging coupling pin operated in a vertical plane by a lever, wheel, or other suitable device.

An improvement in that class of steam vacuum pumps called "pulsometers," which are operated by steam pressure brought directly upon the liquid as the forcing element, while the subsequent condensation of the steam furnishes the lifting power to supply the pump, has been patented by Mr. Gardiner F. Badger, of East Orange, N. J. The invention consists of an improved valve seat designed for the induction and eduction water ways, and of improved devices for holding the valve seats and valve guards in place.

An improved car axle box has been patented by Mr. William G. Raoul, of Macon, Ga. The object of this invention is to provide an axle box for car journals of such design and arrangement as to dispense with the use of the wedge or key heretofore used over the journal brass, and to dispense with the button or collar heretofore used on the ends of the axle to receive the end thrust, and to provide the axle box with a close fitting lid or cover that can be opened and closed easily and quickly.

An improved furnace for locomotive and other steam boilers has been patented by Mr. John Alves, of Dunedin, New Zealand. The grate bars are set out from the tube sheet to leave an air passage between them, and a fire bridge is supported by the grate bars, and is provided with a vertical and inclined and horizontal slots and flange surmounting the air chamber.

An improved dumping scow, which can be dumped very easily, and will float well, has been patented by Mr. Francis Pidgeon, of Saugerties, N. Y. The invention consists in a dumping scow formed of two independent floats, which are connected by means of chains or ropes which pass from the bottom edge of the longitudinal side of one float to the bottom edge of the corresponding opposite side of the other float, which chains or ropes are attached to a windlass, by which the floats can be united or separated, as may be desired.

CANE WITH TOILET COMBINATION.

The annexed engraving represents a very handy combination of comb, brush, and mirror, with a hollow-headed cane intended especially for travelers' use. The comb and brush are confined in the tubular head of the cane by a screw cap in which is placed a convex mirror.

This invention was lately patented by Mr. Richard Lamb, of Norfolk, Va.

The Adirondack Survey.

Shortly before the ice broke up on Lake Champlain, the Superintendent of the Adirondack Survey completed a task in civil engineering which will rank among the most important and interesting feats of the kind ever performed in this country. A number of long lines have been run from the western shore of Lake Champlain back into the wilderness, some of them more than a hundred miles long, and involving several thousand stations. Two of these run from Mount Marcy to points on the lake at Westport and Ticonderoga, and it being found desirable to connect and compare them while the lake was frozen, arrangements were made to have observations taken at the water level at ten stations along the lake on the same day. The work was successfully accomplished, and a line of stations for levels was secured from Whitehall, 126 miles northward, observations being taken at Whitehall, Ticonderoga (Mount Defiance), Crown Point Landing, Port Henry, Westport, Willsboro, Port Kent, Plattsburg, Rouse's Point, and Fort Montgomery.

The Siamese Twins Outdone.

An Italian couple, Tocci by name, are at present exhibiting at Vienna a most remarkable specimen of their progeny, a pair of twins named Jacob and Baptiste. These boys are grown together from the sixth rib downward, have but one abdomen and two feet. The upper part of the body is completely developed in each; their intellectual faculties are of a normal character. Each child thinks, speaks, sleeps, eats, and drinks independently of the other. This independence goes so far as to admit of an indisposition of the one without in the least affecting the other. They are over three years old, in perfect health, and seemingly in excellent spirits.

