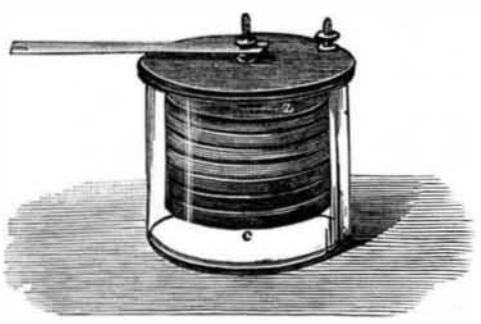
M. TROUVE'S NEW MOIST BATTERY.

M. Trouvé's new galvanic battery is a Daniell cell, which has the advantage of working without liquid, or at least without free liquid, capable of escaping from the cup. Each element, as shown in Fig. 1, consists of a circular disk of zinc, Z, and a disk of copper, C. These are placed parallel and separated by a number of paper disks somewhat smaller in diameter. This mass of paper is capable of absorbing considerable water and hence of remaining moist for a long time. The lower half of the layer of paper disks is soaked in a saturated solution of sulphate of copper, the upper half in a solution of sulphate of zinc. It will be seen that all the elements of a Daniell cell are present, and that the two liquids remain separated better than they would be by porous vases. The sulphate of copper becomes used scarcely any except during the passage of the current, and there is almost no work expended in the battery itself—a constant fault in the ordinary Daniell battery. The copper disk is

Fig. 1.



held in the center by a rod, insulated from the paper and zinc disks, which extends up through the slate cover. The latter fits hermetically over the glass vessel and thus evaporation is prevented. *Les Mondes* states that this battery remains constant for a year, needing no attention whatever. To renew it, it is sufficient to resoak the lower part of the paper in sulphate of copper. The sulphate of zinc being constantly formed by the action of the battery never needs replenishing. When the zinc is used up, a new disk is inserted, and it is best then to put in new paper. The copper, if freed from the pulverulent deposit of the same metal due to the current, lasts indefinitely. The electromotor force is is the same as that of the Daniell element. The resistance varies with the diameter of the metal disks and with the thickness of the paper layers. M. Trouvé has made many applications of this battery, notably to medical apparatus and to the purposes of military telegraphy. In Fig. 2 is represented its disposition in the latter instance. The battery is composed of three hard rubber boxes, superposed, and each containing three elements. This has sufficient power to work a sounder over several miles. It may be carried upside down or in any position.

HARRISON'S NEW PORTABLE FLOURING MILL.

The annexed engraving represents a portable flouring mill manufactured by Mr. Edward Harrison, of New Haven, Conn., in which is combined all the necessary machinery for making flour, namely, grain scourer, grinder, and bolter. Its dimensions are, length 10 feet, diameter 3 feet, size of burrs 20 inches; capacity claimed about a barrel an hour, and weight 1,200 lbs. It is divided into three parts for shipment, the heaviest weighing about 500 lbs.

The bolter or mill case is made in cylindrical form, of wooden staves held together by cast iron heads, into one of which its grinder is fitted, and the scouring machine connected to it. The middlings and bran discharges are fixed in the head of the bolt reel at the opposite end, the bolting cloth being fastened to the reel, which runs the entire length of the mill.

The grinding machinery is supplied with all the improvements peculiar to Mr. Harrison's mills, which we have described in previous articles, including vertical burr and rigid runners, which have the effect, the manufacturer states, of cool grinders. Mills for grinding corn have long been used successfully by farmers and others not skilled in the art of milling, while the manufacture of flour has been done mainly by the large millers, and those running so called custom mills, furnished as a rule with horizontal grinders, by which means Mr. Harrison considers, that heated and damaged flour is produced.

Relative to the present machine, Mr. Harrison shows many testimonials to the effect that the best flour is made in paying quantities, that it received the highest consideration and award at the Centennial Exposition, that its use is being extended all over the world, and that it possesses superior advantages. Its construction is so simple that it does not require a scientific miller to superintend it, and its parts are not likely to become broken because of inexperience in operating it. It includes the necessary process of scouring the wheat before it is ground, which operation removes nearly half a pound of dirt from every bushel of wheat, and affords the means whereby every farmer can have his choice wheat made into flour without the necessity of going long distances to mill.

For further information address the manufacturer, Mr. Edward Harrison, 135 Howard avenue, New Hoven, Conn.

Lighting Cities by Electricity.

In the City of Providence, R. I., 220 street lamps, within a district over nine miles in length, are now lighted and extinguished in less than fifteen seconds by electricity, and the system is controlled by one man. After a trial of several months the practicability of the plan is assured, and if the whole of the 2,500 lamps in the city were lighted in this way, it is estimated that a net saving in expenditure for gas and labor would amount to about $25,000 per annum.

An "Industrial Wood Yard."

Last year some philanthropic individuals in Boston, desirous of helping able-bodied unemployed men by giving them work, opened a woodyard for preparing kindling and stove wood. This plan directly and indirectly was the means for relieving the suffering of some two hundred and fifty persons, who were willing to work rather than to tramp and beg. The results proved so satisfactory that this method will be put in operation during the ensuing winter.

An Aromatic Pipe that Colors in Thirty Seconds.

There will be two opinions as to whether M. Gisclon, in removing some of the troubles of pipe smoking, has or has not done a philanthropic work. If his invention tends to promote pipe smoking he has not; but if we consider that people will smoke despite all the preaching to the contrary that can be done, M. Gisclon deserves credit for obviating some of the expense, much of the annoyance, and possibly some of the dangers of the tobacco pipe. He soaks a pipe of common porous clay, worth a few cents, in a mixture of ether and alcohol, to which a little rose essence is added and in which is dissolved 10 per cent (by weight) of camphor, and 10 per cent of borax or other flux. With this is combined a trace of nitrate of silver. In this preparation, as above stated, the pipe may be soaked or the compound can be applied with a brush over the parts which it is desired to color. The advantages of this treatment, M. Gisclon savs, are that the pipe is made to look like meerschaum and to have a fine gloss; the smoke perfumed by the rose and camphor is agreeably aromatic, the pipe is cheap, and it will color nicely either by smoking or by exposing it to the light; in the latter instance thirty seconds' exposure is stated to be quite sufficient.

The Congo River.

Mr. W. Milner Roberts calls our attention to several references to the size of the Congo, made in Stanley's report and quoted by us, which he finds it difficult to reconcile. They are these: "It certainly exceeds the Nile in volume, and possibly also in area of drainage." "Where Livingstone was stopped, the Lualaba was a noble stream from 2,000 to 6,000 yards wide." That is one mile to three miles

Fig. 2

wide. "Near the equator, it developes into a still broader stream from two to ten miles wide, choked with islands."

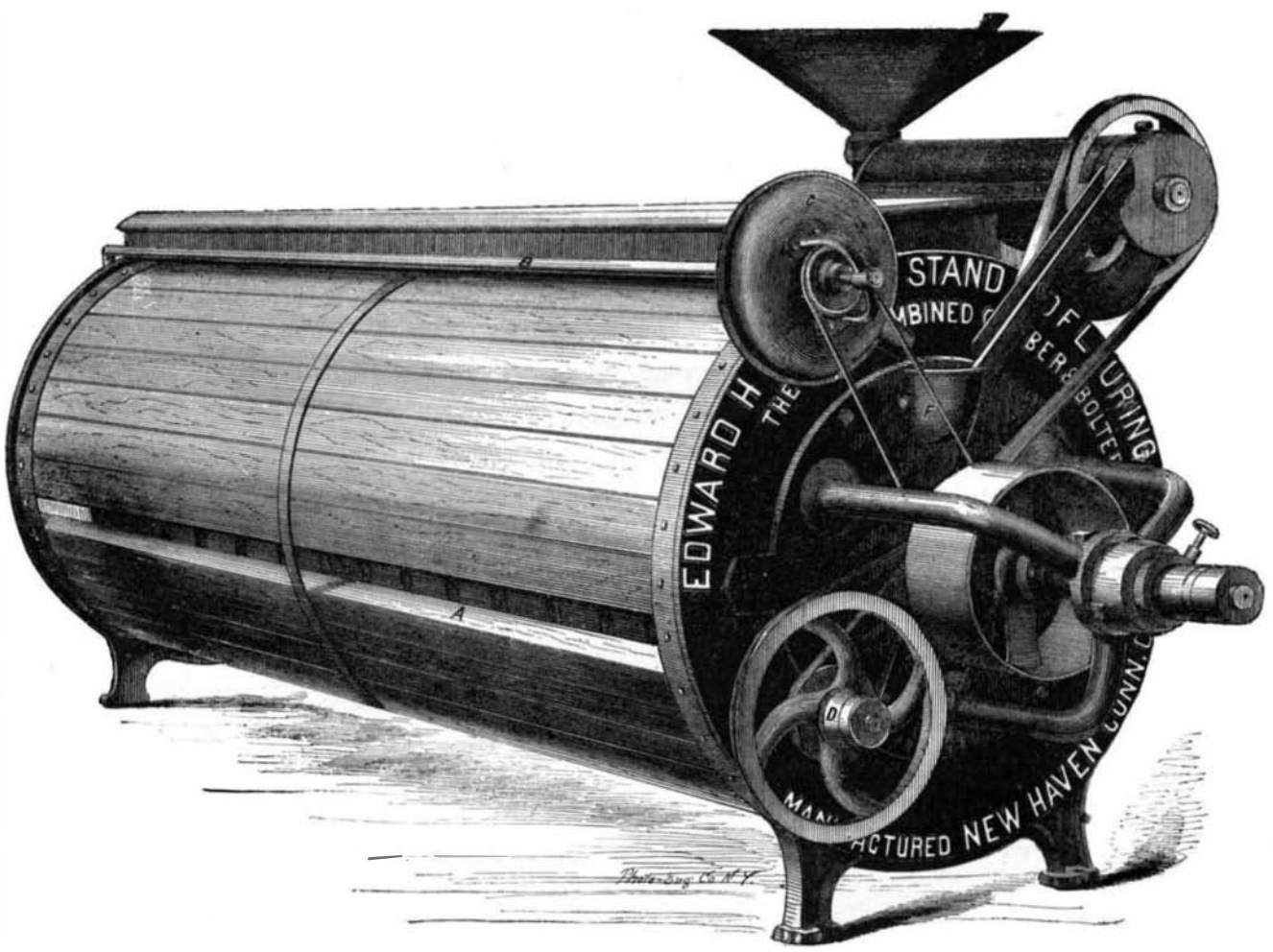
"Then [referring to the Congo] at the cataracts, where the river breaks through the Coast Mountains, the stream narrows to 500 yards or less; then spreads out into a broad stream from two to four miles wide, with a current flowing about three miles an hour. The volume of water discharged is enormous; Captain Tuckey's estimate—2,000,000 cubic feet a minute—is probably not far from the truth." "At its mouth the Congo is a thousand feet deep." "The tide is felt as far as the first cataract, 40 miles up the river."

The quantity assigned for the discharge—2,000,000 cubic feet per minute—in a river two to four miles wide, flowing about three miles an hour (for a width of say three miles) would require a depth of less than six inches. So that either the width and rate of flow must be largely overestimated, or the quantity of water assumed must be very much too little. The flow of the Nile is at least ten times greater than the above, and the flow of the Mississippi must be thirty times greater than 2,000,000 cubic feet per minute.

Now if the Congo were a thousand feet deep at its mouth, with the width above mentioned (three miles) it is obvious that the current could be only about two thousandths of a mile per hour to correspond with the depth further up of only six inches, as the calculation shows; which would be nearly still water. In that case the other phenomena mentioned could hardly occur. The sea would not be freshened forty miles out.

A stream only 100 yards wide and 26 feet deep would, at the rate of three miles an hour, flow a little more than 2,000,000 cubic feet per minute. The Mississippi, just above the head of the passes, with a greater depth, is thirty times wider than that, being nine thousand feet across; and where it is narrowed to three thousand feet it has a depth of a hundred feet or more.

More accurate information than we now have in connection with the Congo river is desirable; and if the details of Stanley's observations do not afford something more definite, the next explorer of the river at the coast should be requested to make more careful notes. It would be interesting to know what the actual discharge of the Congo is —both in its high and low stages.



HARRISON'S NEW PORTABLE FLOURING MILL.