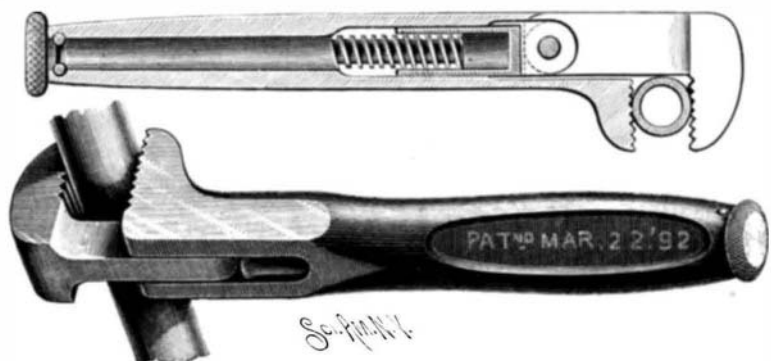


**AN IMPROVED PIPE WRENCH.**

A simple and durable tool, not liable to get out of order, and arranged to securely grip the pipe and readily release it when desired, is shown in perspective and in section in the accompanying illustration. It has been patented by Mr. A. L. Engelbach, of the Eagle Foundry and Machine Shops, Leadville, Col. A swinging jaw is movable opposite the fixed jaw, and is formed on the outer end of an arm pivoted in the forked end of a nut sliding in the hollow handle. The forked end of the nut is rectangular, fitting a similar opening in the handle, so that the nut is free to slide longitudinally, but will not turn in the handle, and the nut has an internal screw thread engaged by a screw rod, the longi-



ENGELBACH'S PIPE WRENCH.

tudinal movement of the rod being prevented by pins in the handle, which engage an annular groove near the rear end of the rod. The screw rod is turned by means of a knob on its outer end, abutting against the rear end of the handle, thus causing the nut to slide and carrying the swinging jaw toward or from the fixed jaw, as may be desired, according to the size of the pipe to be gripped. The opposite faces of the jaws are serrated, to insure a firm hold of the jaws on the pipe.

**SIPHON FOR DOMESTIC USES.**

Every one is familiar with the hydraulic ram and the services which it has rendered in this country for raising water for use in agriculture, gardening, domestic service, etc.

It seemed difficult to simplify this method, still the problem has been solved in a satisfactory manner by the siphon system of M. Le Michel, which is described in a recent issue of *La Nature*, to which we are indebted for our cuts and article. A model of his system was exhibited at an agricultural exhibition at the Palace of Industry, in Paris, last February.

The siphon has advantages over the ram in being able to cause a considerable flow of water over a long distance, and it occupies very little space, as the cut will show, while on the other hand it is only able to raise water a distance equal to the atmospheric pressure, and is not able to pass above 32 feet of elevation.

As its name indicates, the apparatus is founded upon the principle of the siphon. Fig. 1 represents the apparatus entire and Figs. 2 and 3 represent the detail and interior construction.

The siphon consists of two vertical pipes, A and H (Fig. 2), a distributing chamber, B, and a regulator, G. A valve, C, which moves in a horizontal axis, is mounted on the interior of the arc, and a plug,

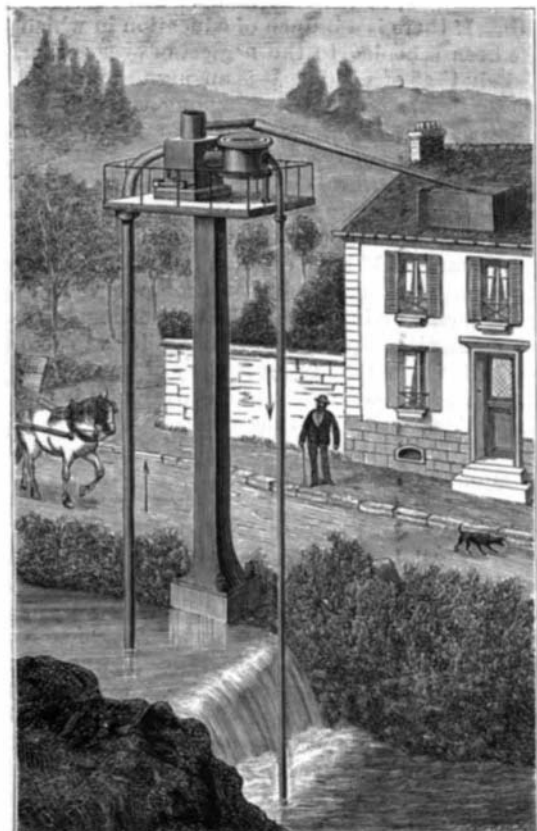


Fig. 1.—THE SIPHON APPLIED TO DOMESTIC USES.

D, is located above this, and is held closed by a spring. A lever bears against the valve to keep it in position, and serves as a counterweight.

These various parts are so simple that they require no attention to insure satisfactory service. The regulator, which is called the "lungs," owing to the function that it performs, consists of a cast drum and two undulating metallic plates, or diaphragms, 2 millimeters in thickness approximately. By their vibrations they maintain the flow of the water and prevent the siphon from becoming empty.

The siphon should first be filled with water through the orifice, K (Fig. 3), which should then be closed by the plug. As soon as both columns are filled, the water begins to flow as in an ordinary siphon. The water from the spring, well or river, under the atmospheric pressure, rises in the pipe, A, passes through the chamber, B, the regulator, G, and passes out through the return pipe, H. During this action the water bears against the valve, C, raises it up and closes it over the mouth of the pipe. As there is no other escape for the water, it forces open the valve, D, and flows out through this opening, whence it passes into the distributing pipe. In the meantime the column, H, is partially emptied and the water in the chamber, G, begins to fall and the diaphragms

regain their normal position. The pressure also on the outer face of the valve, C, is also diminished and the lever carries it back and opens the mouth of the pipe, which allows the water to flow again into the regulator, G. During this action the diaphragms have regained their second position, and the same functions take place again in such a manner that there will be found to be from 150 to 400 pulsations a minute, according to the height, and the water will flow out in a steady stream. Cocks are connected with the two pipes so that the flow of water may be stopped when desired. It is only necessary to fill the siphon once by means of the opening, K, in order to set the apparatus in action. The apparatus shown in Fig. 1 raised water a height of 4 meters, with a fall of only 1.80 meters. Thus it could raise 60 cubic meters every 24 hours, the water delivered being about one-third of the amount which passes through upper chamber.

Thus  $\frac{4}{3.18} = 0.74$  or 74 per cent, which is a very satisfactory result, considering the feeble pressure.

The great simplicity of this apparatus, which operates without any attention or care, renders it particularly adaptable for agricultural purposes and for those having small country places and gardens.

**World's Fair Notes.**

The reproduction of Columbus' caravel, the Santa Maria, is being built by the Spanish government at the Carraca yard at Cadiz. The keel was laid on March 1. The caravel's dimensions are: Length at keel, 62 ft. 4 in.; length between perpendiculars, 75 ft. 5 in.; beam, 22 ft.; draught, 14 ft. 8 in. Great care is being taken with details, and the instruments and appliances of the time of Columbus will be in their places aboard the caravel. The Pinta and Nina, it is announced, are being reproduced by American capital. So visitors to the exposition will be able to see the Columbus fleet complete. The Spanish government will provide crews for the three caravels, dressed as were Columbus' sailors, and the trip across the Atlantic will be made under escort of a Spanish man-of-war. After participating in the naval review in New York harbor, the caravels will proceed to Chicago. After the fair closes they will remain the property of the United States.

A \$50,000 monument to Columbus, designed by Sculptor Howard Kretschmar, of Chicago, will be erected in Lake Front Park, which has been termed the "Gateway to the Exposition." It will be a statue in bronze 20 ft. high, surmounting a granite pedestal 30 ft. high. The monument will form the design for souvenirs of the exposition.

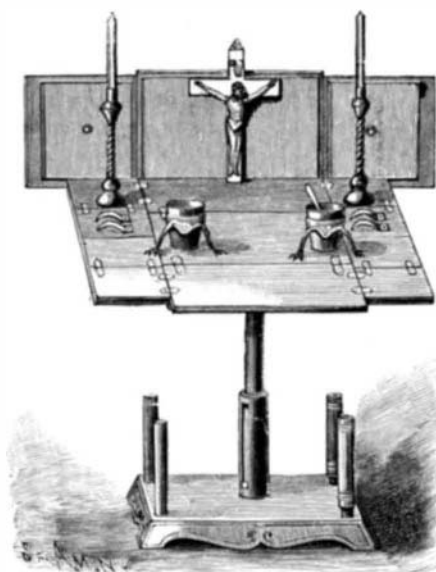
Visitors to the exposition will be able to go comfortably and expeditiously from one part of the grounds to another and obtain advantageous views of the buildings. They may do this either in electric boats through the lagoons or by the intramural elevated electric railway. The contract for the latter has been awarded. There will be five miles of double track, and stations at convenient points. The route, as mapped out, runs from one end to the other of the grounds in a sinuous course. The fare will be five cents, and the capacity of the road about 20,000 an hour.

The exposition, probably, will not have an Eiffel tower or anything approximating it in height, except the elevation to which the captive balloons will ascend. There will be, however, three observation towers about 300 ft. high, for the accommodation of visitors who want to take a bird's-eye view of the grounds and buildings. These towers will be of elaborate design

and beautiful in appearance, and will cost about \$200,000 each.

**A SACRAMENTAL ALTAR FOR HOME USE.**

The illustration represents a compact and ornamental altar table, which may be folded to form an inclosing box or cabinet holding the necessary adjunctive candelabra and vases when the altar is not in use. It has been patented by Mr. Leo C. Beaudet. Upon the base is a center column, made of tubular sections sliding together telescopically, locking pins projecting from an inner tube section into the slot of an enveloping section, and adapted to enter lateral notches of each slot, to hold the table at the desired



BEAUDET'S HOUSEHOLD ALTAR.

height. The table is composed of a rectangular center piece, to which are hinged two main leaves, there being hinged to the ends of the latter opposite supplementary leaves, the edge portions and hinges being so arranged that when all are in open adjustment the table will have a level top surface and the leaves will mutually support each other. A foldable wall piece is secured to the outer edge of the back leaf, and to it is attached a crucifix by a swivel-jointed clip, which holds the crucifix erect when the table is open for use, as shown in the illustration, or horizontally when the table is folded up. The sacramental service ware of cups or vases, candelabra, etc., is arranged on the table, as shown, the liquid-holding vessels being preferably held in bracket stands upon the table. To prevent injury to the candles when the device is packed for transportation and the table folded, a case is provided for each candle, and a holder piece, the cases removed when the candles are lighted being supported on the four corners of the base. The number and style of pieces used in the altar service will vary, of course, according to the desire or means of the user, but the improvement affords an easily portable device which may be readily taken to a sick chamber or set up in the most convenient place in any household.

For further particulars with reference to this invention address Mr. L. H. Beaudet, No. 91 Sixth Avenue, New York City.

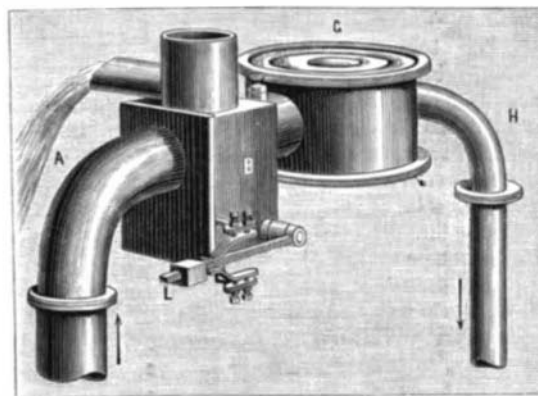


Fig. 2.—DETAIL OF SIPHON APPARATUS.

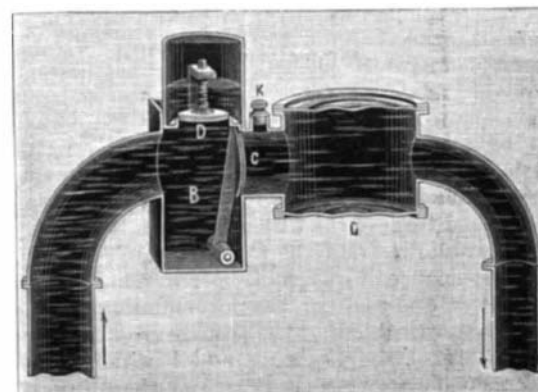


Fig. 3.—INTERIOR CONSTRUCTION—SIPHON APPARATUS.