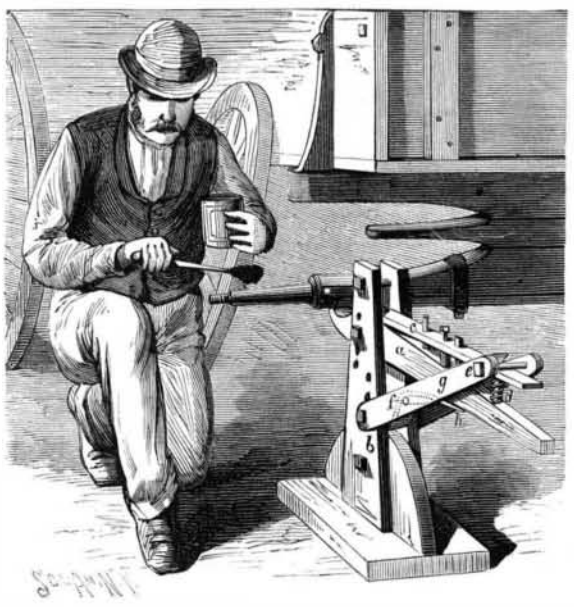
WAGON JACK.

The wagon jack herewith illustrated has been recently patented by Mr. Andrew J. Burke, of Elm Grove, Illinois. The lever, *a*, is pivoted to standards, secured to a base, and provided with apertures for the pintle to permit adjusting the lever higher or lower. That end of the lever which supports the axle is slightly hollowed out. A lever, *c*, is pivoted on the lever, *a*, at the end near the standards, and is pressed upward by a spiral spring, *d*, surrounding a pin projecting upward from the free end of the lever, *a*, and passing through a hole in the end of the lever, *c*, the head of the pin being above this lever. Guide pins on the lever, *a*, pass through holes in the other lever. Two levers, *g*, pivoted to the sides of the standards are united at the free ends by a cross pin, *e*, above the lever, *c*. The apertures in the standards permit pivoting the levers, *g*, at any desired height. A spring, *h*, has one end mounted on the pintle of the levers, *g*, as shown by the dotted lines, *f*; the other end



BURKE'S WAGON JACK.

bears against the bottom edge of the lever, *a*. Between its ends the spring passes over a bolt, *f*, uniting the levers, *g*. To use the jack the hollowed end of the lever, *a*, is placed under the axle and the other end pressed downward. After the cross pin, *e*, has passed the pin, *d*, the free end of the lever, *c*, is pressed toward the lever, *a*. The spring, *h*, presses the levers, *g*, downward. The lever, *c*, is pressed by its spring against the cross pin, *e*, and is held against the pin, *d*, the head of which prevents the lever, *c*, from pressing the cross pin above the upper end of the pin, *d*. The levers, *g*, thus hold one end of the lever, *a*, lowered, the other end and the axle on it being raised.

IMPROVED RUELLE FURNACE FOR REVIVIFYING BONE BLACK.

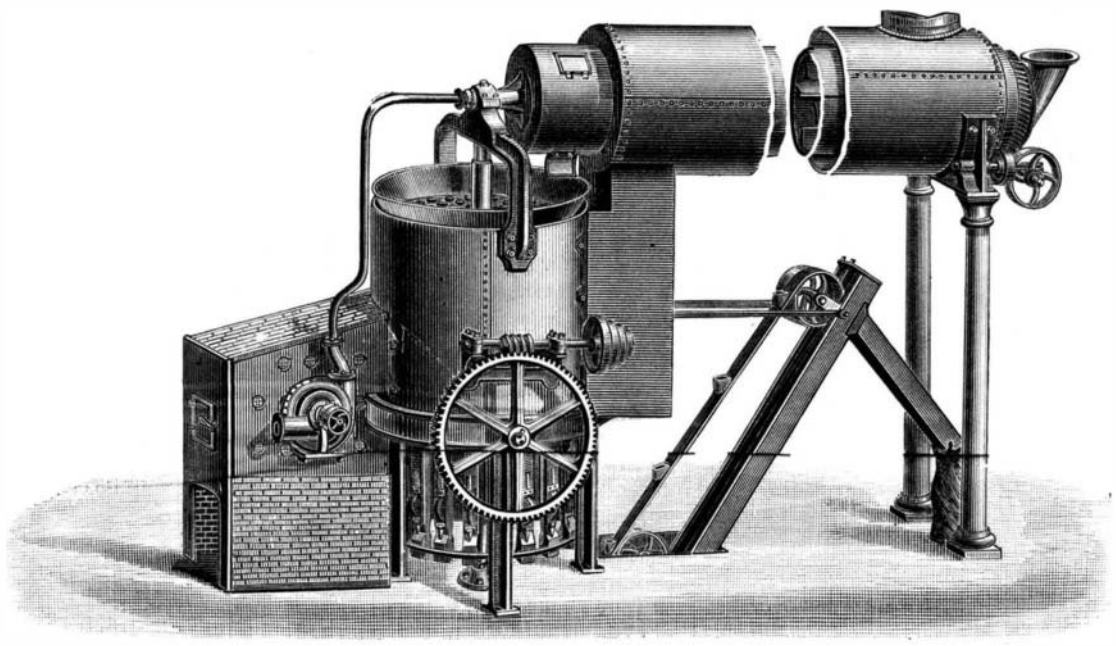
The revivification of bone black, after it has been used, is a very important operation in every sugar manufactory. Among the numerous systems of furnaces that have been proposed for performing it, very few have given the results that were expected of them. The Ruelle furnace, represented in the annexed cut, is not a novelty, and, if we now advert to this well known apparatus, it is because it has been the object of some relatively recent improvements, which it has seemed to us would be of interest to make known.

As well known, this furnace consists of a certain number of vertical retorts, designed for baking the black, and the upper extremity of which debouches into a hopper, into which the black to be revivified is thrown, while their lower extremity debouches into cooling tubes. The whole is inclosed within a cylindrical casing of fire bricks covered with plate iron. The first improvement added to the apparatus is the automatic method of emptying the tubes. With this object in view, the apparatus is so constructed that it may be revolved around a central axis by means of an endless screw and gear wheels. Each cooling tube is provided at its lower part with a distributing box of cast iron, and between this and the tube there is arranged a sheet iron valve, provided with a steel spring, which opens or shuts in passing into a bifurcation, and permits the black to enter the box. The distributing box is provided with a counterpoised door that is opened and closed by the same method as the valve just mentioned, so that on the second revolution of the furnace the black that is contained in the box falls over an inclined plane into a bag, or into a car.

Formerly the black to be revivified was, before being introduced into the retorts, dried upon a cast iron table, which was heated by waste heat from the fire-place. For the last year and a half this table has been replaced by a mechanical drier. This is the second improvement which we have to call attention to.

This drier consists of two concentric sheet iron cylinders, the external one of which is fixed, while the internal one is given a rotary motion through an endless screw and a helicoidal wheel. This latter cylinder is provided internally with four spiral paddles that each forms a quarter circumference on the length of the cylinder, so as to constantly stir up the black and cause it to move forward progressively toward the furnace hopper. A furnace designed to revivify from 100 to 110 hectoliters of black every twenty-four hours contains 54 retorts, and burns but 5 hectoliters of coal. With the system of emptying the tubes just described we are always sure of revivifying the same quantity of black—the latter remaining the same length of time in all the retorts. Moreover, as the latter receive the same degree of heat, we are certain that the black will always be baked uniformly. The mechanical drier is not only advantageous because it is heated by waste gases, but also because it prevents the black from being crushed or wasted. In this furnace the internal cylinder is 6 meters in length by 0·85 in diameter at the entrance and 1 at the outlet. The external one is only 6 meters in length, and its diameter but is 1·3 meters.

We may also mention, in conclusion, that the apparatus is provided with a small blower for driving hot air into the movable cylinder. The bad odors from the black are thus forced out of doors.—*Annales Industrielles.*



FURNACE FOR REVIVIFYING BONE BLACK.

Novel Mode of Dredging.

At a recent meeting in this city of the American Society of Civil Engineers, a paper by Mr. L. J. Le Conte, C.E., was read, describing the dredging operations at Oakland Harbor, Cal. The work described was the excavation of a tidal basin, and the deposit of the excavated material on the adjoining salt marshes. The machine used was a pump dredge, with a cutting apparatus consisting of a horizontal wheel with ordinary plows upon its lower face. The rotation of this wheel makes the excavation. Over this cutter, and partly surrounding it, is a hood, which allows water to enter only from beneath. Over the top of this hood a 20 inch pipe leads up to the large centrifugal pump of 6 feet in diameter. From this a line of wrought iron pipe, supported partly on pontoons and partly on the marsh, extends several hundred feet upon the tract to be reclaimed. The material, after leaving the cutter, is taken up by the water, passes through the pump and through the pipe to its place of deposit, without at any time during the transportation coming to a state of rest. The engines are two 16 x 20 inch engines, used exclusively for driving the centrifugal pump, and two 12 x 12 inch engines for driving the cutting apparatus, swinging the gear, etc. The steam is supplied by two 100 horse power boilers, generally carrying from 90 o 95 pounds of steam. The amount of material transported with the water runs at times as high as 40 per cent by volume; but experience has shown that in the material excavated at this point, which is a blue clay mud, it is not advisable to carry more than 15 per cent, particularly in order to secure a uniform distribution at the place of deposit. The total quantity moved by one dredge in eight months was 250,000 cubic yards. The best work in one month was somewhat over 60,000 cubic yards in 230 engine hours; the average distance of transportation being 1,100 feet. The greatest distance transported was during October, when 45,000 yards were deposited in 190 engine hours, through 1,600 to 2.000 feet of 20 inch pipe. The average daily expense account was stated as approximately $102.00, but this did not include the cost of the nine or ten men on shore, employed to secure a proper disposition of the material, particularly as the fill approaches completion. Nor did it include the cost of retaining embankments where required. The result of the work was stated to be, with this one pump dredge, an average of 30,000 cubic yards, measured in the cut at a maximum cost of 10 cents per cubic yard; and in one particular month of 23 days' work, 60,000 cubic yards were deposited on shore at a distance of 1,600 to 2,000 feet from the dredge, at a cost of 5 cents per cubic yard. The complete distribution of the material at the place of deposit has been very satisfactory, the result being a cluster of cones whose slopes are very flat; not more than 1½ per cent, and frequently so slight as to appear almost level.

IMPROVED AIR COMPRESSOR.

To successfully use atomized liquids in the treatment of diseases of the upper air passages, it is necessary that the current be continuous. The well known double bulb atom-

IMPROVED AIR COMPRESSOR.

izing hand ball, made of rubber, has the great disadvantage that both hands of the operator are employed, and the continued effort is very tiresome. The accompanying engraving represents an apparatus which is easily worked, compact in form, and light in weight. The pump cylinder is 2½ inches in diameter by 3 inches stroke, is mounted on an arched stand, and contains a piston furnished with a valve opening upward. The piston is connected to the foot pedal by a forked connecting rod, and is moved by a slight and easy motion of the foot. The upper end of the pump cylinder is closed, with the exception of an aperture, which is covered by a valve opening upward into a cylindrical air reservoir secured to the upper end of the pump. A flexible rubber hose is attached to a stop cock near the top of the reservoir. Immediately on top is a spring gauge indicating the air pressure from one to twenty pounds. By a little exertion on the part of the operator, the pressure can be kept at any point, and, when filled to ten or twelve pounds, there is air enough to give a spray, with a good atomizer, for ten minutes, or long enough to make application to three or four patients in succession without pumping.

The same plan furnishes a simple and efficient device for maintaining a continuous supply of air for blow pipe use. As much of the oxygen of the air is taken up by the lungs, exhaled air is deficient in heating qualities. This defect is overcome by the use of the compressor, which not only saves a great amount of hard work, but delivers a stronger and steadier blast than is possible to maintain with the mouth. With ordinary care it will last for years, the only attention required being a drop of oil occasionally on the leather packing ring.

The apparatus is manufactured by Mr. J. Elliott Shaw, 154 South Fourth Street, Philadelphia, Pa.

A Liniment for Rheumatism.

The *Therapeutic Review* says: Methyl salicylate (oil of wintergreen) mixed with an equal quantity of olive oil or linimentum saponis, applied externally to inflamed joints affected by acute rheumatism, affords instant relief, and, having a pleasant odor, its use is very agreeable."