

et, now full, begins its downward course, and, acted on by gravity, travels down to the end of the rope.

Before proceeding further, it will be well to notice the arrangements for supporting the wire lines in order to keep them from sagging along their length. This is accomplished by clips, Fig. 3, one of which for each rope is attached to a midway post. The lower end of this device is turned up and shod with a metal plate. The line fits, as shown, in an inside groove, and is there secured by a key, D, driven firmly in. This means of support clearly offers no obstruction to the passage of the bucket rollers, and still holds the line up firmly in position. The usual nuts, screw, and washers, serve to attach the clip to its post.

We left the filled bucket near the end of the upper line; and supposing it to have arrived over the coal heaps, it is ready to discharge its contents. Referring once more to Fig. 2, pivoted to the side of the bale is a slotted piece, E, which slips over an upwardly projecting stud, thus holding the bucket in the position shown. Attached to piece, E, is a rod, F. The construction of the bucket is such that the rear or bottom curved portion is the heavier, so that, when empty, its tendency would be to invert to the left of the engraving; but this is prevented by a lug, G, which takes against the bale, so that the receptacle naturally assumes a level position. When, however, it is full, the delivery side overbalances the other; and to prevent its turning over and thus discharging, the catch, E, is used. If, therefore, the filled bucket be started down the rope, it will hang square until the rod, F, strikes some obstacle and, thus pushed back, swings up the catch. Discharge immediately takes place, as shown in the large engraving, and then the bucket reassumes its level position, the piece or catch, E, falling naturally back again over the projection on the side.

The empty receptacle will now have arrived at the end of the upper rope and is ready to start on its return along the lower line. In Figs. 4 and 5 vertical and plan views, the switch mechanism is represented. H is the upper wire rope, and I the lower one. J is a peculiarly shaped metal arrangement, to which both of the above mentioned ropes are secured, as represented by the dotted lines. Pivoted to J is a tongue, K, directly in line with the rope, H; and this tongue is counterbalanced by a weighted lever which ordinarily holds it in the position indicated by the dotted lines. When the bucket comes rolling from the left along the rope, H, its wheels strike this tongue; and pushing it down so that its further end rests against the opposite side of the piece, J, they run over it and up and along the line which forms a continuation of the rope, I. That is, the bucket runs up hill until its motion is arrested, when of course it takes up a return movement. As soon, however, as the bucket clears the tongue, the weight on the latter pulls it up again; so that, when the returning bucket reaches the piece, J, the tongue no longer forms a bridge between the opposite ends. The bucket is therefore compelled to continue straight on down the rope, I, which, as shown at K, in both Figs. 4 and 5, forms a downward path leading off at an acute angle.

If the reader will refer again to the large illustration, he will see the empty bucket on its returning course near the middle post. The lower rope is firmly secured at its end to a hanger on the pole, which forms the starting point of the apparatus, but is continued by another line, B, which leads out along an arm, passes over a pulley, and ends in a weight which keeps it taut. On this line the bucket runs and necessarily drags it down, its weight counterbalancing that on the rope, so that it is gradually eased down into the hold of the vessel. Here the fillers remove it from the line, and then, by suitable means, allow the latter to become gradually once more taut.

In Figs. 6 and 7 are shown the plan and elevation of the turntable device, by means of which a bucket may be transported to any desired point in the yard. L is a curved metal arm connected to a support, at M, to two pivots, transverse and vertical, so that it has free movement in both of these directions. At its opposite end is affixed a standard, N, Fig. 7, on top of which is arranged a small roller, O. Fastened to the solid framework of the device is a metal band or track, P, which has a curve conformable to a circumference, described with the arm, L, as a radius, as shown in Fig. 6, and also, besides, a downward bend, as shown in Fig. 7. On this band, the roller, O, rests, and thereby supports the arm, L, hanging beneath. At the upper part of standard, N, and near the roller is secured a cord which, passing over a pulley, at Q, terminates in a weight, R. The object of this arrangement is to draw the arm, L, up automatically to the highest point of the curved band, P, or in the position of Fig. 6. When thus placed, the end of the upper wire rope, H, directly meets the end of the arm, L. Consequently a bucket sliding along rope, H, will run up on the arm until its motion is stopped by the ascent and then start down again. Meanwhile the under rope, I, has been connected so as to coincide with the bar, if the latter were carried over (its upper roller running on P) to the position marked by the dotted lines. The bucket, however, it is evident, running back over the arm, L, would fall from the end, unless prevented, while the arm was being shifted. This difficulty is obviated by arranging boards inside the track, P, against which the receptacle takes and is stopped. At exactly the point, however, where the dotted arm and rope, I, coincide, an opening is made out of which, of course, the bucket escapes and travels away down rope, I, to the desired point. The boards inside the track may be made movable so that, rope, I, being attached at any place, a suitable opening can be easily made.

It is hardly necessary to explain the advantages of this very ingenious apparatus, since, we think, they are obvious from the details of the description. The fact may be noted,

however, that this device differs from many others of its class, in that the road itself does not move, endless belt fashion, but merely the buckets. Hence a single line may be put up, supported at intervals as we have described, for almost any length; and then the buckets can be dragged over it by connecting a light endless cord or equivalent arrangement.

The absence of cumbrous trestle work or staging, and of elevated or underground tracks, is a point of merit, as is also that of gravity being the sole agent for performing the work. As to its employment the inventor considers the arrangement especially adapted to retail coal yards, on account of its portability and economy. An attachment, he states, may be applied to weigh and register the weight of each bucket passed over the rope, so the only power required is that needed to hoist it to the necessary elevation.

The device is covered by several patents, and is the invention of Mr. A. F. Havens, a well known engineer of this city. Further information regarding right to use, etc., may be obtained of the proprietors, the American Gas Works Construction and Supply Company, room 33, 61 Broadway, New York city.

Scientific American. MUNN & CO., Editors and Proprietors. PUBLISHED WEEKLY AT NO. 37 PARK ROW, NEW YORK. O. D. MUNN. A. E. BEACH.

TERMS. One copy, one year... \$3 00 One copy, six months... 1 50 CLUB RATES { Ten copies, one year, each \$2 50... 25 00 { Over ten copies, same rate, each... 2 50

VOL. XXIX., NO. 13. [NEW SERIES.] Twenty-eighth Year. NEW YORK, SATURDAY, SEPTEMBER 27, 1873.

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THE VIENNA PATENT CONGRESS ONCE MORE.

It will be remembered that this body, after long discussions, adopted a series of resolutions affirmatory of the duty of all nations to encourage the arts and sciences by the grant of patents to inventors, in reward for useful discoveries, specifying also the various legal provisions by which inventive rights ought to be secured. But the Congress then proceeded to destroy the practical value of its labors by adopting as its final resolution the absurd proposition that inventors ought not to be allowed to sell their patent rights except at such rates as government officers might dictate.

The most singular circumstance connected with the passage of this silly proposition is, that it was supported and its adoption secured by American votes. Mr. R. W. Raymond, of the Engineering and Mining Journal, who was a delegate, is our authority for this statement. He says that the American party was strong enough in numbers and in logic to defeat the obnoxious resolution, and would have succeeded in doing so had not two of their number, Hamilton Hill of Boston and Mr. Hall, changed their minds during the night, and voted next morning with the opposition. These gentlemen palavered at a great rate during the five days' discussions in favor of granting liberal rights to inventors, and then, at the last, they changed front and voted against the essential thing for which they had been arguing. It is to be hoped that American inventors may never again be misrepresented by such a pair of incompetents.

MANUFACTURE OF ILLUMINATING GAS FROM CRUDE PETROLEUM.

The Pittsburgh Commercial states that the method discovered by Mr. Charles Gearing, of that city, has been put into successful practical operation at Sharpsburg, Pa., and the borough is now admirably lighted by gas made from crude petroleum oil, 8,000 feet of gas being produced from one barrel of the oil.

As the subject is one of great importance, not only to the inhabitants of our towns and cities, who need good light at a cheap price, but also to gas companies and oil producers, we will give a few details of the Gearing process, from which practical gas men may, in some degree, judge of its actual merits. To us it looks like a good improvement, worthy of the careful investigation of all who are interested in the extensive branch of industry to which it pertains.

In the simpler form of the Gearing apparatus, some seven retorts are employed in connection with one furnace. These

retorts have double chambers, made by enclosing small cylinders within other cylinders of large diameter. The inner cylinders are filled with pebbles, the object of which is to provide very extensive heating surfaces. A jet of steam and air is, by means of an injector, introduced at one end of the first of the series of retorts, and then passes on through the pebbles, successively into and through three other retorts, until the steam and air are thoroughly dried and heated; thence the jet goes into contact with the crude petroleum in another retort and takes up therefrom a supply of the oil vapor, thence on successively through three other retorts contained in the furnace, where the final heating takes place, thence into the gas holder. The operation is simple and continuous. The peculiar construction of the retorts is alleged to prevent loss of oil by conversion and deposit into solid carbon, the only resulting deposits in the retorts being the sand usually found in crude oil, with some other foreign matters.

A company has been formed, we understand, to put this process in operation in Titusville, Pa. We shall look with much interest for the practical results. The success of this or any other method of employing crude oil for permanent gas illumination would create an immense demand for the article and give relief from the depressing effects of over production under which the oil market now suffers.

THE DEPARTMENT OF PARKS, NEW YORK CITY.

Mr. S. H. Wales, formerly of the SCIENTIFIC AMERICAN, has recently been chosen President of the Department of Parks in this city, with a salary of \$10,000 a year. This is a post of much responsibility, the duties of the office are onerous and varied, and their discharge with satisfaction to the public requires the exercise of marked ability on the part of the incumbent. Happily for Mr. Wales, he retired some time ago from active business life, and is therefore enabled to devote his whole time, if need be, to the important functions that now devolve upon him, and which, we are glad to say, are especially congenial to his tastes. In æsthetics Mr. Wales is a gentleman of the highest cultivation, a lover of science, an extensive traveller, a careful observer and an indefatigable worker. He possesses, moreover, an intuitive appreciation of the wants of the people; he is an approachable man, and a gentleman of the noblest integrity. His administration is, therefore, likely to prove not only popular but most useful. His unanimous election as President reflects the highest credit upon his associate commissioners.

The general scope of the powers and labors of our Department of Parks is not generally understood, and is far more extensive than is commonly supposed. It embraces the custody of twenty-four parks, covering an area of more than 1,000 acres, of which the Central Park has cost nearly \$12,000,000. The work also includes the surveying and laying out of all streets and avenues north of 59th street, the hydrographical surveys of the Harlem river, the care of bridges across the river, the building of tunnels and suspension bridges, and the establishing of bulkhead lines. It also takes in the surveying and laying out of streets and avenues in the adjoining towns of Kingsbridge, West Farms and Morrisania; and upon the annexation of those towns, the regulation and grading of streets and avenues, drainage, etc., will belong to the Department. It has charge of the construction of the Museums of Natural History (the two structures now in progress costing \$500,000 each), also the care of these museums and of an observatory. All these require the constant service of a large force of architects, engineers and laborers (some 1,500 in all.) A distinct police force is also maintained by the department. It also runs a menagerie, and an exotic and plant-propagating department, which requires many skilled gardeners. In addition to these the Department employs blacksmiths, tailors, carpenters, painters, plumbers, stonecutters, masons, etc.

The ordinary expense of maintaining the parks is about \$500,000 per annum; and for construction of works, \$1,000,000 was appropriated for the year 1873. The Commissioners are now laying out and constructing two new parks (Riverside and Morning Side); and in short the details are very numerous.

From the foregoing, which is only an outline of its labors, it will be seen that the Department of Parks is one of the most important institutions in our midst. The effective management of its extensive concerns involves more real labor, watchfulness and ability, on the part of its executive, than almost any other department of municipal or state government.

CHEMICAL SUGAR.

Dealers and manufacturers of the important article of sugar have lately experienced a disturbance of the even tenor of their ways by the announcement of a new chemical discovery, by which saccharine commodities may be produced as by magic, without the troublesome and expensive methods of cane growing and grinding. The new discovery is credited to M. Jouglet, a French engineer, and his process is alleged to involve the mere bringing together of certain common and cheap articles, from which the best qualities of sugar are rapidly and economically produced. The process is claimed to be the subject of a patent, which is at present in the hands of a large company.

We imagine that the stock of the company will be for sale on the market a long time in advance of the sugar, and we advise sugar manufacturers not to shut up their existing establishments just at present.

There is undoubtedly room for improvement in the manufacture of sugar, and many diligent students are engaged