IMPROVED MOVABLE DOCK CRANE.

Our illustration shows one of two coaling cranes erected at the General Terminus Quay, Glasgow, for the Caledonian Railway Company, by Messrs. George Russell & Co., engineers, Motherwell, near Glasgow. These cranes, says the *Engineer*, are constantly at work, loading coals into vessels, by lifting the railway wagons in a cradle, and occasionally loading and discharging boilers and other heavy pieces as required. The special feature is that these cranes are semi-portable and self-contained, including their foundation seat, and could at little expense be removed to another site.

The seat of the carriage is constructed according to Mr. Russell's patent. It is 4 feet deep, of plates 1½ inches thick, and angles of steel riveted together. One side rests on, but is not fixed to, the quay wall. The other side rests on a concrete block, to prevent sinking into the ground. The bearing on the quay wall is 17 feet long and 12 feet broad, measured at right angles to the edge of the quay. The seat carries a forged wrought iron post, with Russell's patent bearing and inclosing jacket. The advantage of this arrangement is that the surfaces on which the crane revolves are protected from dust, while the bearing surfaces are adjustable and removable without disturbing any other parts. The jib is 47 feet long, with a radius of 27 feet, and is fitted with a pair of rails inside, on which a weight travels on four flanged wheels. This weight is attached to the end of a cradle by a chain which passes over a pulley near the top of the jib, so that while the cradle is being raised the weight travels down the jib, and *vice versa*.

The tipping of the cradle is controlled by the driver of the crane by a catch worked from the platform, which fixes the tipping chain from lowering, while the main chains are lowered out sufficiently to allow the coals to slide out of the wagon. This arrangement dispenses with the man usually employed to wind up the tipping chain. There are two pairs of engines—those for hoisting having 9 inch cylinders, while the turning engines have 6 inch cylinders, all fitted with link reversing motion. The driver's platform and coal space are covered by a neat wrought iron house, with lock-up door, and the handles are all arranged near a window in front, from which the driver has a full view of the load. All the parts have a very abundant margin of strength. The toothed gearing is of cast steel, and altogether these cranes are specially well adapted for continuous heavy work, with a minimum expense of tear and wear. The weight of each is 92 tons.

Processes for Preserving Iron from Rust.

Besides the Bower-Barff furnace process for protecting iron by covering it with a deposit of the black or magnetic oxide, which is not liable to corrode, and the numerous copies of this method which have come before the public, the same object is alleged to be attained by the De Meritens electrolytic process. In this method the object is immersed near the anode in a bath of distilled water heated to 80° C.; a plate of copper being the anode. The action that goes on results in the formation on the iron of a layer of magnetic oxide, which is treated afterward in the ordinary way by oiling, etc., according to the style of surface required. Peroxide of lead can also be used for the same purpose; it gives a black, very adhesive deposit by the electrolysis of an alkaline solution of litharge. According to *La Lumiere Electrique*, an analogous process, the invention of a Mr. Haswell, has recently been experimented with in Vienna. In this process iron or steel is plunged as an anode in a bath containing from 0·5 to 5 per cent of chloride or sulphate of manganese, with from 5 to 20 per cent of nitrate of ammonia. The electrolysis is effected in the cold bath, with carbon cathodes. Feeble currents of from 0·1 to 0·2 of an ampere cover the iron with a deposit of peroxide of manganese, which adheres well and is not subject to further oxidation. In view of modern revival of artistic blacksmiths' work, there is likely to be a brisk demand for these preservative processes, which, while they do not hide the hammer work like paints, shall be even more effectual in preventing rust.

The Birch.

London Garden speaks as follows regarding a valuable hard wood: "The birch is capable of supporting a much greater degree of cold than any other tree. In the old world its northern limit is 71 degrees upon the west and 63 degrees upon the east coast; in America its northern limit is 64 degrees upon the west and 58 degrees upon the east. In Germany the highest elevation at which it is found is 5,200 feet above the level of the sea; in Sweden at 3,900 feet, and in Lapland at 1,722 feet. It is worthy of remark that this tree decreases in size not only as it advances toward the north, but also as it proceeds southward beyond the limits of its native region. It attains its highest perfection and greatest height in Germany and southern Sweden. The birch is not particular in its choice of soil or situation, and will grow almost equally well in sandy, rocky, dry, or damp soil."

Correspondence.

The Hydraulic Ram.

To the Editor of the Scientific American:

In your notice of Ribes hydraulic ram in your issue of July 5, you state that in the "old style of ram it is necessary to take off the air chamber at least once a month to exhaust the air." You should have said "in order to replenish the air," which will become exhausted in less time than that, unless some provision is made to keep up the supply, and this can easily be done by drilling a very small hole (about the size of a horse hair is right) through the brass flange ring by which the drive pipe is attached to the ram. Have this hole in top when the pipe is connected, and it will furnish a constant supply of air to the ram, and do away with the necessity of taking off the air chamber, or pulling out plugs and getting wet, with the thermometer at zero. The manufacturers of rams are probably ignorant of the fact that their rams will not work without air, or they would put something in them to furnish it.

GEORGE Q. PEYTON.

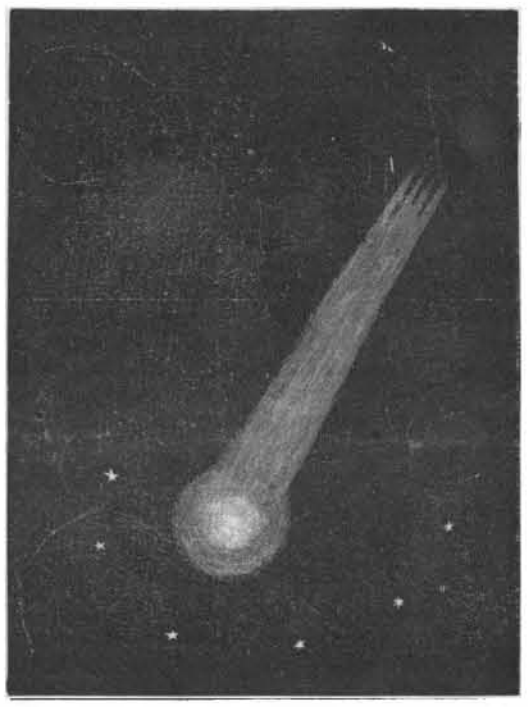
Rapidan, Va.

COMET BROOKS 1 OF 1890.

To the Editor of the Scientific American:

The comet discovered by me on March 19, in the eastern morning sky, is now in a very favorable position for observation in the evening. Although it is becoming fainter, it is still nearly three times brighter than at discovery, and can be readily picked up with telescopes of moderate aperture.

I give herewith its telescopic appearance on June 15,



COMET BROOKS 1 OF 1890—TELESCOPIC VIEW.

which was about two weeks after its perihelion passage. The head of the comet was surrounded by a beautiful semicircle of telescopic stars, as shown, presenting a fine field indeed.

The comet is situated well up in the northwestern heavens. It has recently passed between the last two stars in the handle of the "Big Dipper," and is moving in a southerly course through Canes Venatici. Its present direction of motion is very nearly on a line drawn south from the star Mizar—the middle star in the handle of the Dipper—to a point two and one-half degrees above the star Alpha Canum Venaticorum.

To enable any one to easily locate the comet, I will say that on August 1 it will be about eleven degrees south of Mizar, and on August 10 the comet will be about three degrees south of its place on August 1. On August 20 it will be about two and one-half degrees above the star Alpha Canum Venaticorum, and on the last of August, four degrees south of its last mentioned position. These positions will indicate its course, so that the comet may be found on any intermediate date, or traced still further in its celestial journey.

WILLIAM R. BROOKS.

Smith Observatory, Geneva, N. Y., July 23, 1890.

The Kerosene Lamp and its Defects—A New Invention Greatly Needed.

To the Editor of the Scientific American:

Another of those frequent kerosene oil tragedies has just occurred in West Ringe, N. H., where a woman and child have been burned to death.

Being in the lamp and oil stove business, I think it advisable to furnish a few hints in connection with the immediate cause of such disasters. Before proceeding further, I must remark that the present system of burning oil, both in lamps and oil stoves, seems like a satire upon this progressive age.

A flame oxygenated by air currents to the fiercest heat is placed directly in contact with a brass tube through which all the oil consumed has to pass. Of course this tube, being always made of brass, is one of the most rapid conductors of heat, and soon becomes excessively hot. A better device for generating explosive gas could hardly be conceived.

The worst of it is that the gas thus rapidly generated falls into the oil font and is all ready for an explosion the moment that the smallest part of it comes in contact with fire. A slight current of air will often convey some of this gas to the flame, when the conflagration or explosion is almost sure to follow.

If the numerous inventors who read your instructive journal could substitute some device for the present mechanical and scientific outrage, something not too complicated and expensive, I risk nothing in asserting that such a device, if brought before the public in a business way, would become universal.

The horrors just referred to have now become so frequent that they receive only a brief and passing notice in the daily papers.

KEROSENE.

Charlestown, Mass.

How a Snake Climbs a Tree.

To the Editor of the Scientific American:

As a reader of the SCIENTIFIC AMERICAN for the last twenty years, I have often read very interesting articles on the above subject, but have found little real information as to how the feat is actually performed; that is, in regard to the climbing of large trees without limbs, and trees with smooth bark. Many writers have described snakes found in situations indicating that they must have climbed so and so, to reach such and such positions, but on the 7th day of this month I was treated to the actual observation, with my own eyes, of not only the climbing, but the descent, which I will try to describe as near accurately as it is possible for a man to tell a snake story.

While exploring in search of ferns a very deep and thickly wooded ravine with tall trees above on either side and underbrush almost entirely shutting out the light of the sun, and rendering the place cold and damp, yet almost stifling for want of a circulation of air, I suddenly came upon a common black snake about four feet in length sticking fast to the side of a tree. My first impulse was to stop short and see all I could before he should take fright and drop, but after watching him until tired, I began to try to disturb him, thinking he would let go the tree and drop to the ground, as his head was but about six feet above the ground. This he did not intend to do; it was not his style of doing business, as I afterward became convinced. Nor would he move until all the sticks and stones at hand had been thrown at him, but one, however, having touched him about the middle of the body, causing him to loosen from the tree about one foot of his body, which he carefully replaced. The tree, I should state, was a cottonwood about 15 inches in diameter, with the ordinary rough bark common to this tree when of this size, very perpendicular and straight, and with a distance of about 35 feet to the first limb.

Failing to hit him further, I next cut the longest stick near me (about 10 feet) and getting a little closer by climbing upon a fallen tree top, I tried to touch him, but the limbs settling down with my weight, put me again out of reach. I climbed the steep hillside and came down directly in front and within six feet of him, where I stood for some time taking a more accurate survey. I found him in almost a perpendicular position, but with very short and abrupt curves in a number of places in his body. The straight places in his body were fitting very closely in the conjugations in the bark for six or eight inches at a stretch, and taking advantage of every offset in these conjugations, both to the right and left, yet with no intention whatever to encircle the tree, which could have been easily done by a snake of his size.

After a long examination and study of these traits, I at last resolved to make him do something, so I touched him gently with my stick, when he began moving his entire length, first turning his head downward. He carried his head and some three or four inches of his neck erect, the same as if crawling on the ground, and picked out a route down to the ground, not more than six inches from where the rest of his body was going up. He lost no advantage he had already possession of, and taking things very deliberately he thus gained the ground, not moving the length of himself in less than one minute. I thus had before me the very rare spectacle of a snake climbing both up and down a tree at the same time. I have no doubt but that he could have gone to the very top of the tree just as well as six feet, and have come down as well, had he so desired. I do not think his object was to sun himself nor to catch birds, as the dead tree top close by offered a better position for either, but to get in a position to catch flies, in which the place abounded, probably attracted by the coolness of the glen on a very hot July day.

JOHN E. GARSIDE.

Peoria, Ill., July, 1890.

To kill blue grass growing between bricks around the lawn, wash the bricks with salt water or strong solution of soda.

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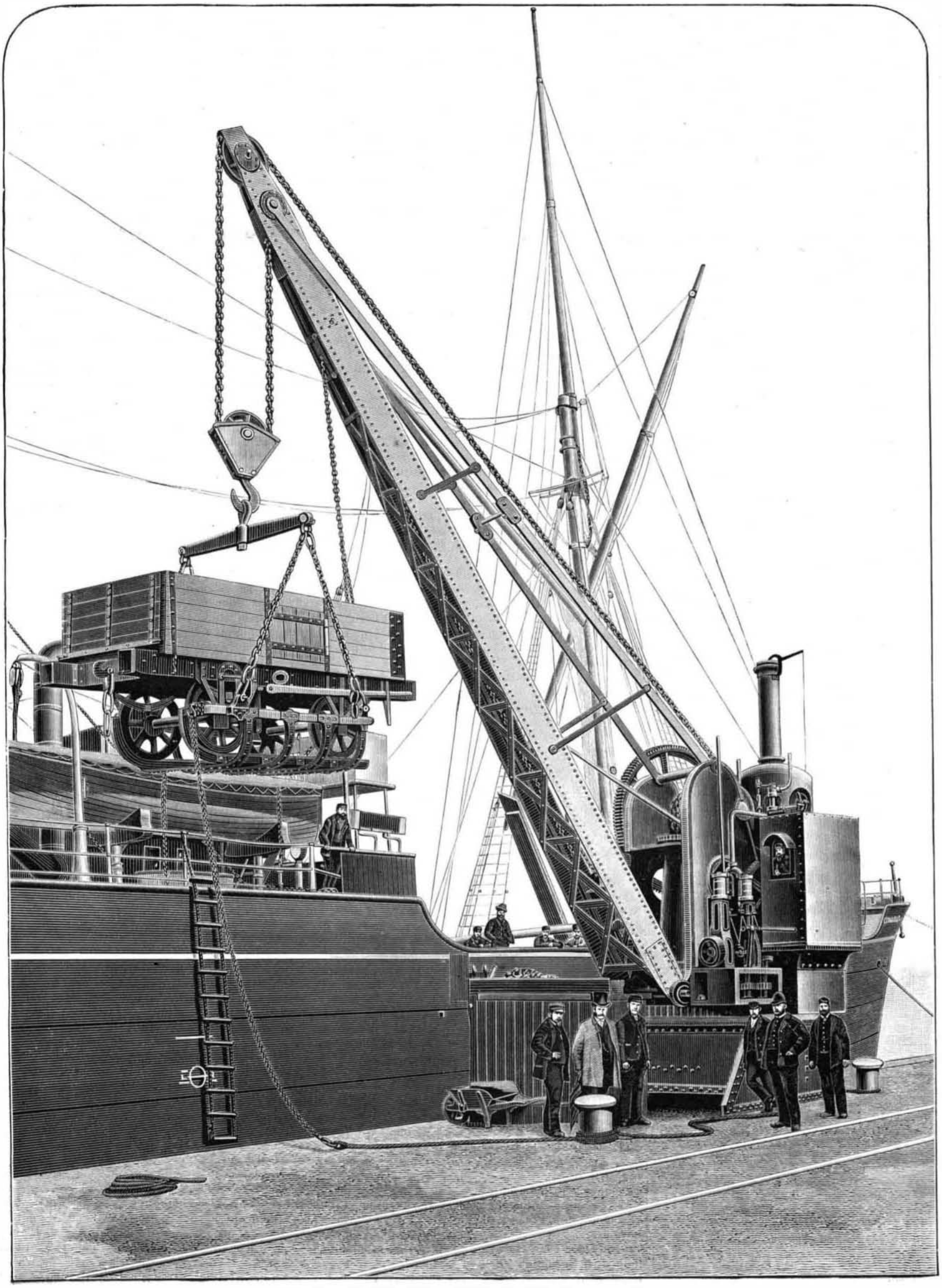

IMPROVED MOVABLE DOCK CRANE.—[See page 69.]