

## DEEP WATER DREDGING AROUND NEW YORK.

Superior as are the natural waterways by which New York is surrounded, the channels of the North and East Rivers affording in general sufficient depth to accommodate vessels of the deepest draught, there are still a few places, especially in the East River, where the government is engaged in removing shoals or reefs, to give a safe depth in all parts. In the SCIENTIFIC AMERICAN of August 1 we illustrated and described the progress of operations in the removal of Diamond Reef, between the lower end of New York City and Brooklyn, and on the first page of this issue we illustrate work which has been in progress for several weeks for the removal of a shell reef in the East River near the foot of Tenth Street.

At the commencement of the work there was here only a general depth of seven or eight feet, the bottom consisting of sand, gravel, and clay, with many large boulders. The pile of broken propeller blades, anchors, chains, torn metal sheathing from the bottoms of vessels, etc., brought up by the grapple, and shown in one of the views, gives a good idea of the necessity of undertaking the work. Eighteen of these broken propeller blades were found around one of the boulders removed.

The scow or float on which the dredging machinery is mounted is 120 feet long and 44 feet wide by 15 feet deep. In addition to the anchors by which it is held in position, a heavy beam passing down through a suitable opening in the hull is dropped into such engagement as can be effected with the bottom, to hold the scow more steadily in a fixed position. The boom is pivoted to swing freely, and is sixty feet long. The grapples when fully open have a spread of fifteen feet, and their total weight is fourteen tons. As they close together the fingers fit between each other a short distance, until stopped by a web-like portion against which they abut. The grapples are operated by  $1\frac{3}{4}$  inch steel wire ropes, one from each side, the grappling power being three times that of the pull on the rope, from the winding of the rope on a smaller drum within the frame above the jaws. The ropes are connected with a friction drum operated by the engine on the scow, the wood-faced friction clutches used being of great size. The operator controls the working of the grapple by pressing with the hand and foot on a lever at each side of him, as shown in one of the views.

This grapple dredge is adapted to hoist a maximum load of seventy tons, lifting ordinarily twenty to thirty tons. One of the boulders removed in the present work weighed twenty-six tons. The stone taken out is paid for by the ton, and the other material by the yard. The government has two other dredges of a similar kind now at work near Hell Gate, the government dredges, as well as the one shown, being built by Mr. R. G. Packard, of the Atlantic Dredging Company, New York, who are now doing the work on this reef. These dredges are adapted to operate a mud scoop or a shovel as readily as a grapple, the change from one to the other being made in a few hours. After the removal of the boulders, in the work now in progress, there will be an indefinite quantity of sand, gravel, and clay to be removed by the shovel before it will be certain how much blasting of solid rock will be necessary. The projecting edge of a ledge broken off by the grapple had a surface measurement on one side of seven to twelve feet, and weighed about nine tons.

In the view on this page we represent one of the methods employed for determining and exactly locating the inequalities of the bottom. The rods or tubing with which the vertical measurement is made are held by guide ropes, and slide freely

in keepers on a horizontal bar extending from the sides of the tug, the rods bearing plain marks, so that it may be readily seen how far they are immersed, while observers with instruments, at different points on the dock front, exactly locate the place and the depth of each sounding, signals being passed, both by whistle

advance the distance comprised between two teeth, its extremity, engaging with another tooth, prevents the system from moving backward in the rocking motion in the opposite direction, but if this result fails, the horse simply returns to the starting point.

It is thought that owing to this little artifice the sport will assume some interest, and that people will soon be, if they are not already, betting heavily on these singular racers. —*Les Nouvelles Inventions.*

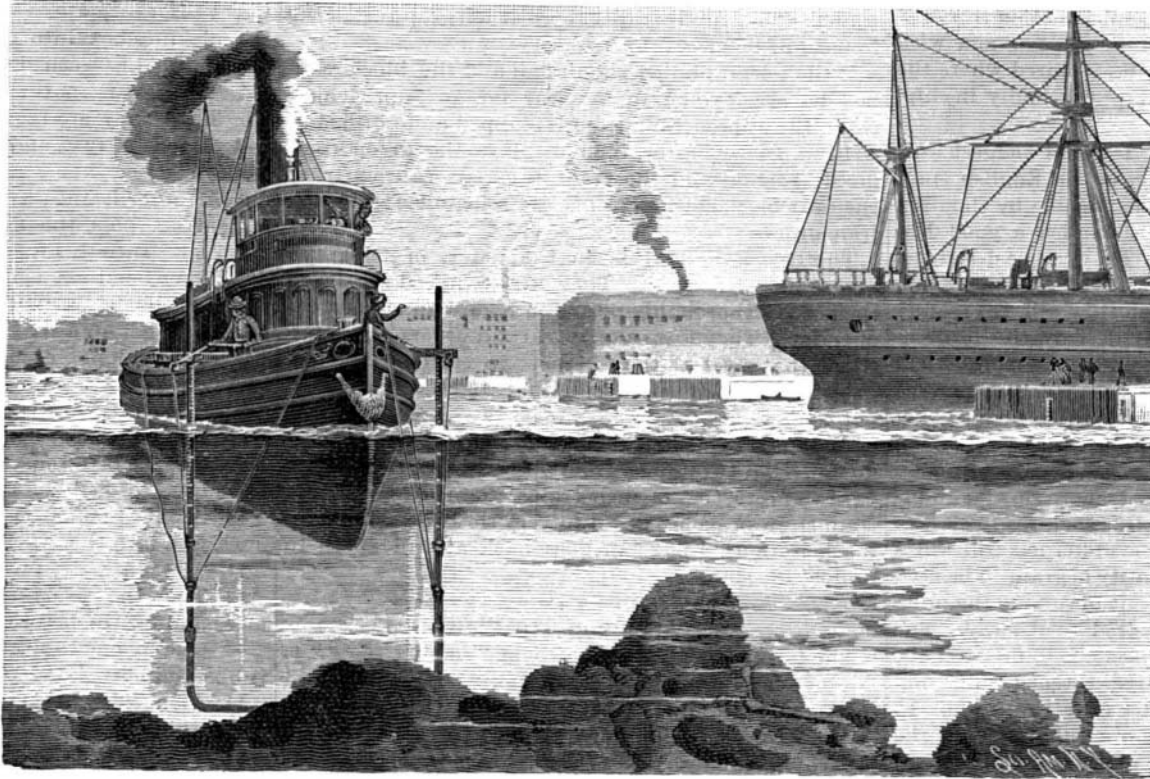
## A Chameleon Spider.

M. E. Heckel, of Marseilles, has, says *Nature*, recently described an interesting case of mimicry which may be frequently seen in the south of France. The mimic is a spider, *Thomisus onustus*, which is often found in the flowers of *Convolvulus arvensis*, where it hides itself for the purpose of snaring two Diptera, *Nomioides minutissimus* and *Melithreptus origani*, on which it feeds. *Convolvulus* is abundant, and three principal color variations are met with; there is a white form, a pink, one with deep pink spots, and a light pink form with a slight greenishness on the external wall of the corolla. Each of these forms is

particularly visited by one of three varieties of *Thomisus*. The variety which visits the greenish form has a green hue, and keeps on the greener part of the corolla; that which lives in the white form is white, with a faint blue cross on the abdomen, and some blue at the end of the legs; the variety which lives in the pink form is pink itself on the prominent parts of the abdomen and legs. If the animal happens to live on *Dahlia versicolor*, the pink turns to red; and if it lives in a yellow flower—*Antirrhinum majus*, for instance—it becomes yellow. At first Prof. Heckel supposed the three varieties of *Thomisus* to be permanent, but he discovered accidentally that any one of these peculiarly colored spiders, when transferred to a differently colored flower, assumes the hue of the latter in the course of a few days; and when the pink, white, green, and yellow varieties are confined together in a box, they all become nearly white.

## Jamach, the Wild Animal Collector, Dead.

London, like every great metropolis, is full of curious characters, who from time to time come to the surface and become known from their eccentricities or from the accidentally curious course of their lives. Mr. Jamach, who has recently died, is one of the latter class. He was born about 1815, and has for years been known as one of the greatest collectors of wild animals and various natural history curiosities in the world. His shop in St. George Street, London, has been famous for generations. The number and variety of specimens that were found there side by side from extremely opposite parts of the world was astonishing. One of his choicest acquisitions is a pair of dwarf cattle from Nepal, India. They belong to the same order as the sacred Brahmin cattle, which have been dwarfed by the process of selection after centuries of careful breeding. They were only 25 inches in height. They are perfectly formed cattle, the bull being a dun, and the cow soft brown in color. Mr. Jamach, besides his collection of animals, rare birds, parrots, etc., has some valuable artistic and ethnographic specimens, such as Japanese and Chinese vases, bronzes, and masks. Many of them are covered with dust and have not been disturbed or touched for years. There is a Burmese Buddha five feet high, and a magnificent figure of Vishnu. Besides these there are Aztec and Mexican relics and magnificent carved ivory figures from Ceylon. The whole forms a veritable curiosity shop.

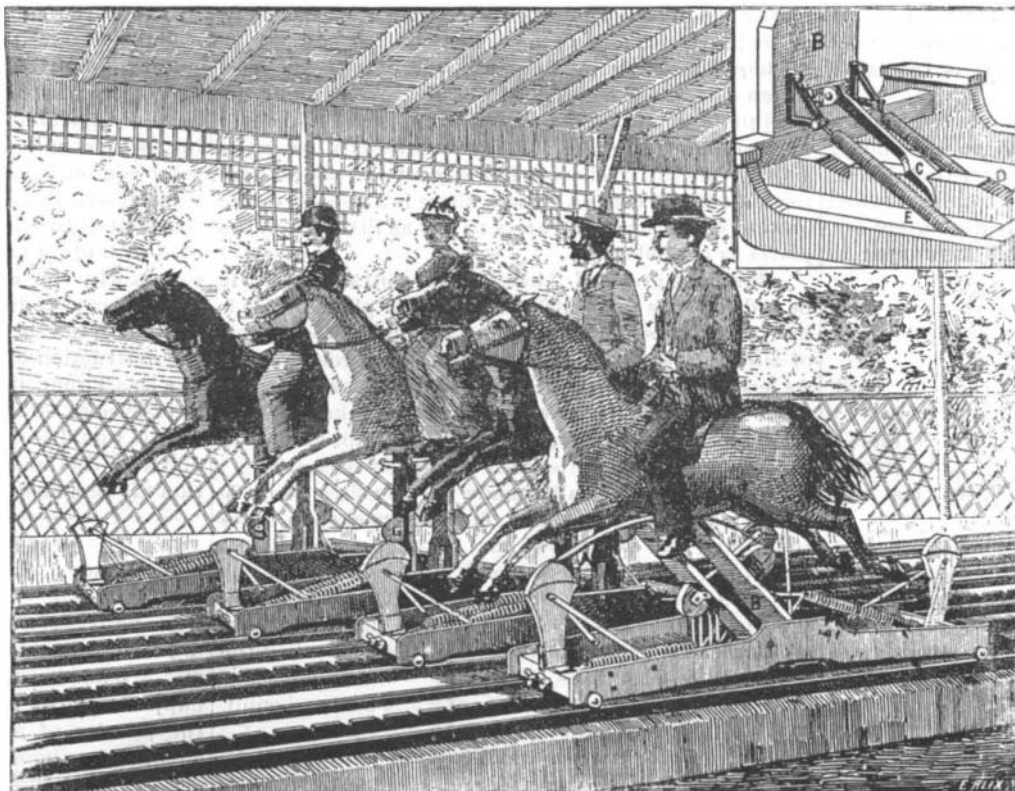


LOCATING AND MEASURING SHOALS AND SHALLOWS.

## HYGIENIC HORSES.

Every one knows of the rocking horses which for some years past have constituted one of the great attractions of country festivals. The Paris Garden has for some days past been offering a new source of amusement based upon the same principle, but in which the horses, instead of remaining in place, roll upon rails, thus adding a new element of success to the combination, since, owing to this improvement, one can have the treat of a true horse race that has nothing in common, as regards rapidity, with the races of Longchamps, but in which it is the most skillful that will triumph. The detail figured in the right hand corner of the engraving shows how the system operates. One of the rails is formed of a flat iron, and the corresponding wheels have channels which fit into it perfectly. The other rail, on the contrary, is V-shaped, and the wheels that engage with it are simply rollers. As a consequence of the rocking motion of the horse on the support, B, the carriage rolls to a certain extent upon rails, carrying along the ratchet, C, which slides along a rack, D, placed between the rails.

If the impetus has been sufficient to make the ratchet



HYGIENIC HORSES.

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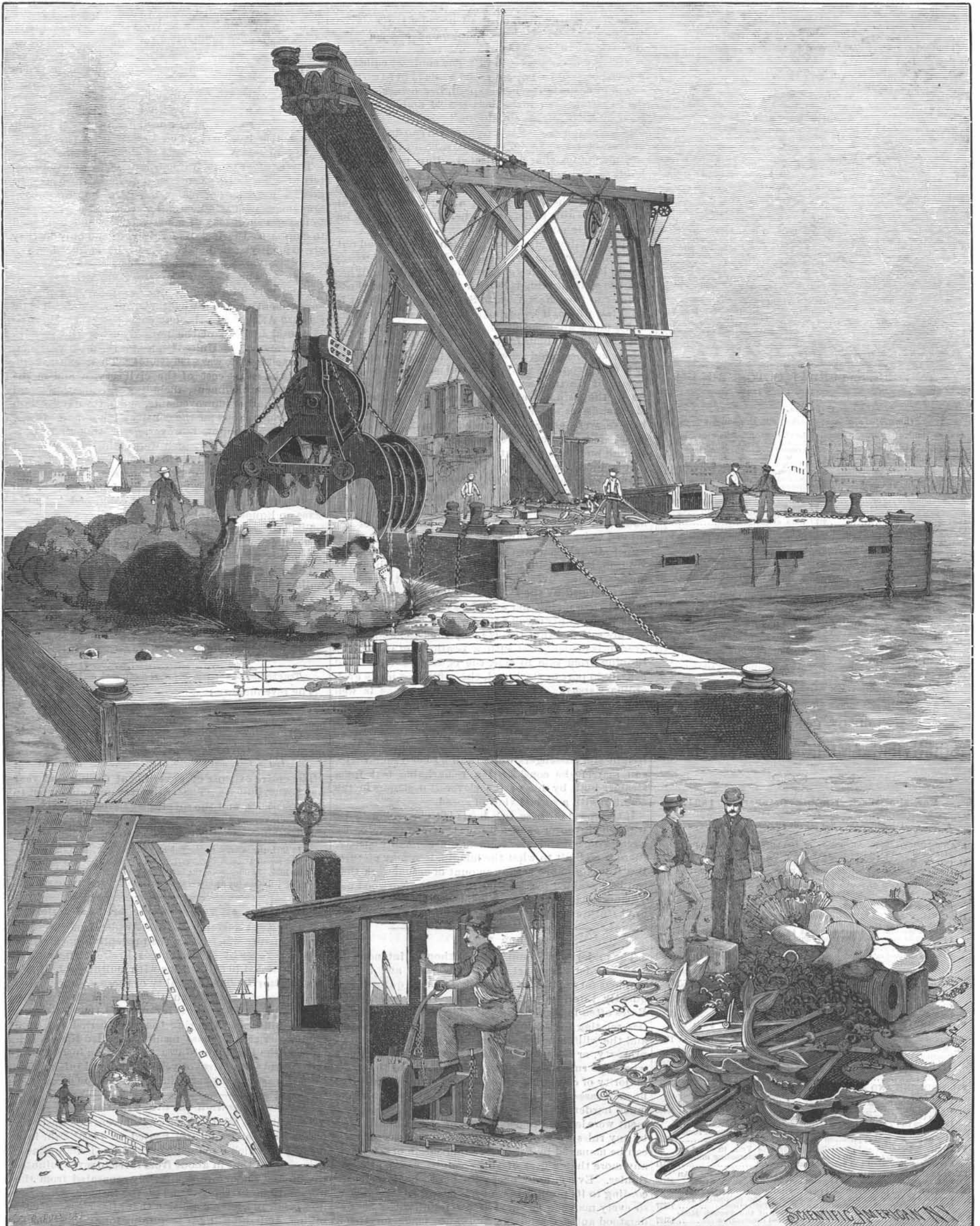
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A MAMMOTH GRAPPLE DREDGE AT WORK IN THE EAST RIVER, NEAR TENTH STREET, NEW YORK.—[See page 214.]