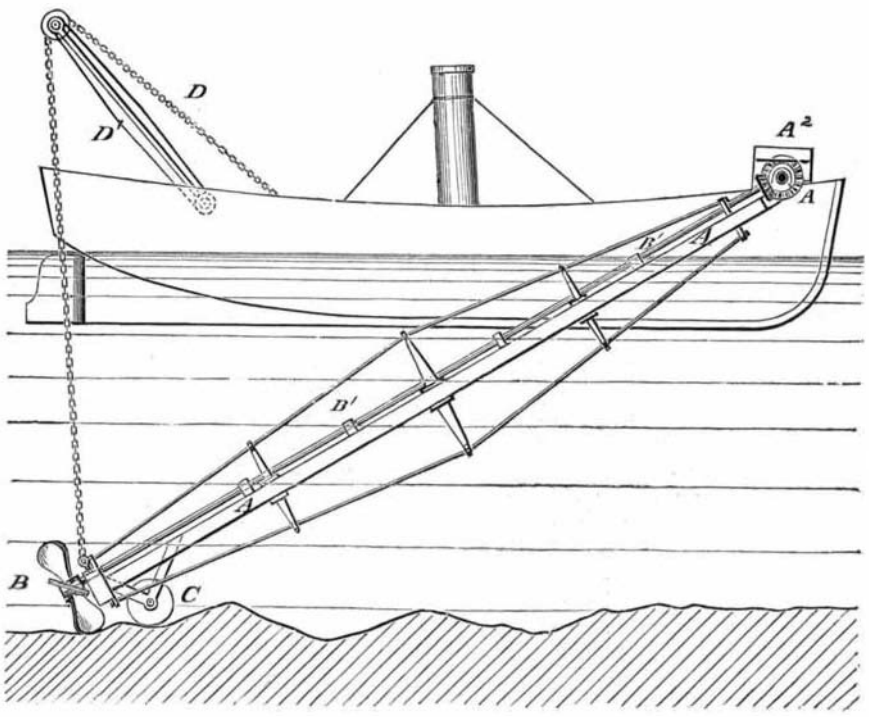
A NEW DREDGING APPARATUS.

In the dredging apparatus represented in the engraving, propellers driven by suitable motive power work partially in the material or sand bank to be removed, so causing whirlpools and bringing the mud or sand into a state of suspension in the water, where the current washes it away. The propellers are carried at the ends of beams, which, at their opposite ends, are hung to a lateral frame of a barge or vessel. The ends of the beams carry back of the propellers rollers to run upon the mud or sand, and prevent the propellers and beams from entering too deeply into it.

In the engraving, A A are the beams, of suitable construction and length, that are hung at the upper ends to a shaft A^1, that is supported in bearings of a lateral frame, A^2, of a suitable barge or vessel, and driven by a steam engine on board of the same. The driving shaft, A^1, revolves, by beveled gear wheels, the shafts, B', that turn in bearings of the beams, and are provided at their lower ends with a propeller or propellers, B. Each propeller or stirrer, B, consists of a four-bladed screw of unusual strength, with two blades set in advance of, and being somewhat longer than, the other two. The propellers are lowered to the bottom of the river or canal, or other water courses, and then revolved to work on the sand bank or material to be removed, so as to stir up the same and bring it into a sufficient state of suspension in the water to admit of its being carried away by the current. A roller or rollers, C, are arranged back of the propellers, turning in suitable bearings of the beams, A, to prevent the propellers from entering too deeply into the mud so as to break or get stuck.

The propellers and beams are lifted by means of chains, D, and crane, D', into position alongside of the vessels, when the work of removing the sand is to be interrupted, the propellers serving then to move the vessel.

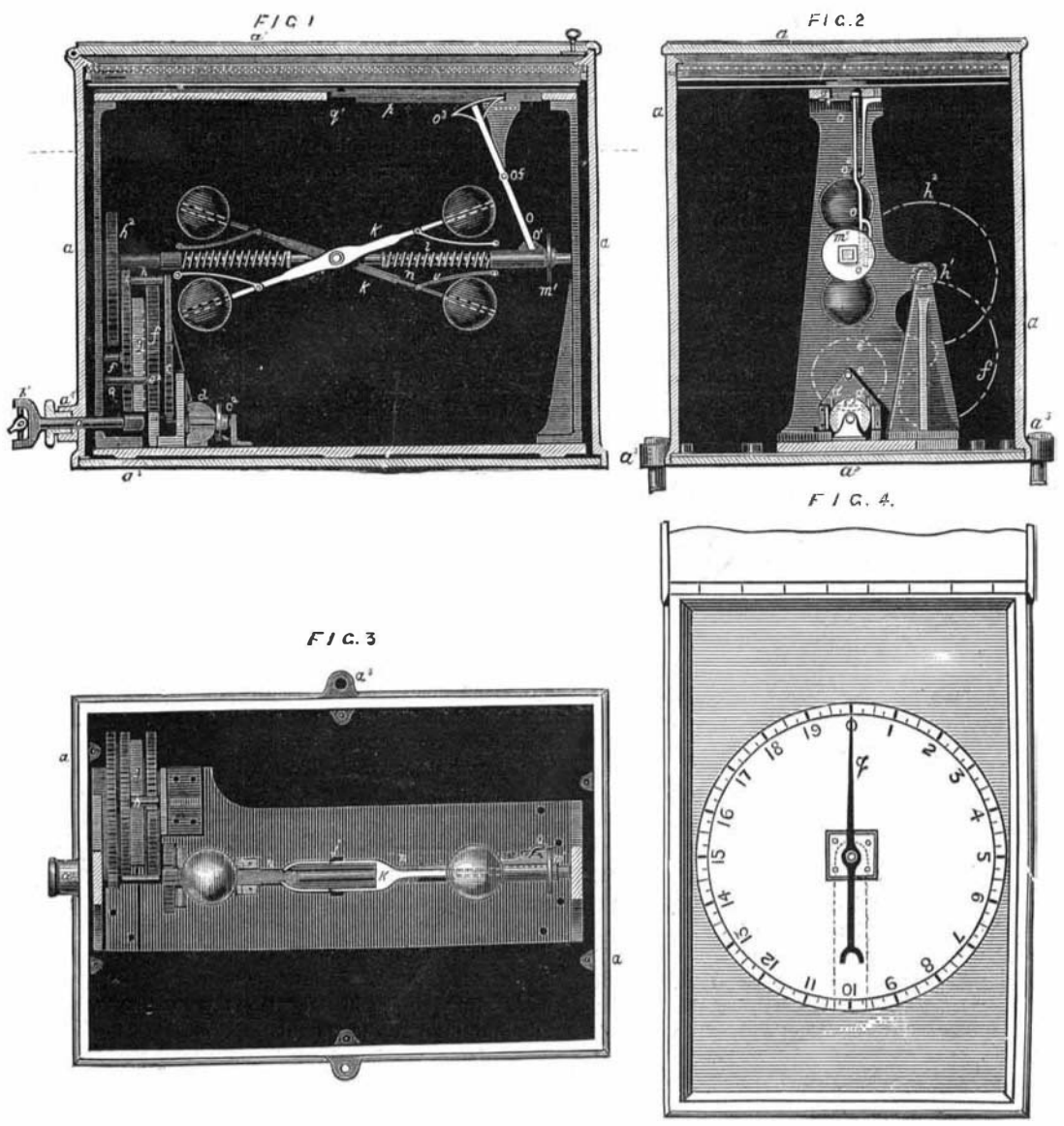
This invention was patented through the Scientific American Patent Agency, November, 7, 1876, by Messrs. J. J. Van Rietschoten and W. Houwens, of Rotterdam, Netherlands.



DREDGING APPARATUS.

IMPROVED SHIP'S SPEED INDICATOR.

We illustrate, from *The Engineer*, a ship's log or speed indicator, patented by Mr. W. de Normanville, of Bridge-road, Hammersmith, England. Fig. 1 is a longitudinal section of the apparatus; Fig. 2 is a transverse section: Fig. 3 is a plan with some of the parts removed: and Fig. 4 represents separately the dial and index. *a a* is the case of the instrument; it is constructed of cast iron, and is provided with a hinged lid, a^1, immediately beneath which there is a plate of stout glass secured in a watertight manner. Lugs are provided, by which the instrument is secured to the rail of the ship or vessel; a^4 is a stuffing box in the side of the case to receive a spindle, *b*, carrying a universal joint, b^1, through which the connection with the rotator is made; a^5 is a screw plug in the bottom of the case, which, when taken out, leaves a hole admitting of the introduction of a turnscrew to insert or remove the small screw pin, b^2, by which the spindle, *b*, is held in a socket, c^1, at the end of the axis, *c*. The frame which carries the axis, *c*, and the other working parts of the instrument is fixed to the bottom, a^2, of the case, so that the whole of the mechanism comes out with the bottom when that is removed; c^2 is a disk on the axis, *c*; it bears against friction rollers, *d d*, mounted on the frame so that the axis may revolve freely, notwithstanding the strain to which it is exposed in towing the rotator through the water; c^3 is a pinion on the axis, *c*; it drives a wheel, e^1, on an intermediate axis, *e*, on which again is a pinion, e^2, driving a wheel, f^1, fixed on an axis, *f* ; f^2 is another similar wheel on the same axis, but able to turn upon it. It is fixed to the spring box, *g*, in which is a coiled spring, having one end fixed to the axis and the other to the interior of the spring box. This arrangement constitutes a regulating apparatus: the spring, being wound up by the action of the rotator, is the maintaining power driving the indicating instruments, to which it imparts a regular velocity free from sudden changes. The wheel, f^1, drives a pinion on the axis, *h*, on which is also a spur wheel, h^2, gearing with a pinion on the main axis, *i*. In the middle of the axis, *i*, is a pin, which serves as an axis for the two weighted arms, *k k*; they have weights at their ends arranged so that the divergence of the arms is not affected by the pitching of the vessel. *l l* are links connecting the arms, *k*, with the sliding collars, *m m*. When the instrument is in use the centrifugal action of the weighted arms compresses the springs, *d n*, more or less, according to the speed of rotation. On one of the collars, *m*, there is a disk, m^1, against which a friction roller, o^1, carried by the lever, *o*, bears. The lever, *o*, carries at its upper end an arc, attached to which is one end of the fine chain wound round a barrel at q^1, on the axis on the index. *r* is a light spring surrounding the axis, q^2, and attached to it at one end, while the other end is fixed to the frame; it serves to hold the index back against the action of the lever, *o*, to keep the chain, *p*, always tight, and to hold the roller, o^1, against the disk, m^1. The dial is graduated to indicate the speed of the ship in knots per hour. The prime motor of this instrument is a small screw or rotator similar to that used in other logs, drawn after the vessel by a line some 150 feet in length. The shaft of the rotator is about 12 inches long by about 1 inch in diameter, made of such specific gravity that if left to itself it would slowly sink, but it is easily kept up by the line to which it is attached, drawing it through the water, some 8 feet below the surface. This rotary motion of the screw is conveyed by the line to the rest of the mechanism.



NORMANVILLE'S SHIP'S SPEED INDICATOR.

A New Autographic Process.

Autography is a long known process by which manuscript, or drawings, made on common paper by means of a peculiar kind of ink, may be transferred to a lithographic stone and then printed.

A new method, which is said to be both simple and cheap, is described by Professor G. O. Sars, of the University of Norway, in the *American Journal of Science and Arts*. The drawing is done on common letter paper, which, on one side (where the drawing is to be made), has been coated, by means of a sponge, with a thin film of starch. As it is not well for the shading to use quite glossy paper, it is a good way to give it a granulated surface by pressing it against a lithographic stone. By using for this purpose stones with more or less smooth surface, the paper will assume any degree of smoothness required, according to the character of the drawing. The next process is to fasten the paper to a sketching board or a piece of pasteboard; the drawing is then made by means of the lithographic crayon.

The paper must be cut to the size intended for a full plate, and the drawings arranged in the same order as they will have to appear in the printed plate. The method is the same as in common drawing with lead pencil, or rather crayon. The figures should, however, first be sketched in outline on common paper and then transferred to the prepared paper in the usual manner, by means of transparent paper and plumbago paper, blue paper, or, still better, red paper, the transferring being done with a lead pencil that is not too soft. The details of the figures, the shading and finer structural conditions, may be drawn off-hand with the crayon on the prepared paper, after the outline has been transferred. Any correction or change in the drawing can easily be done by erasing with a fine scalpel, taking care only that the starch film be not injured. When the plate is finished to satisfaction, it is transferred to a common smooth lithographic stone, in the following simple way: The back of the paper is moistened with water containing a small portion of nitric acid; and, after having been put for some time between moistened soft printing paper, the plate is laid, face downward, on the stone, which then for a moment is put in the press. To make more sure of it the outside of the paper may be slightly rubbed with the finger; if then the paper be stripped off, the drawing and the entire film of starch will remain on the stone, the figures being reversed. Now the stone is to be treated in the common way with gum arabic and a weak etching, and will then be ready for printing. The whole process of transferring the drawing from the paper to the stone is simple, but requires practice and great care. This should, therefore, be left to the charge of a professional lithographer. This process is especially well adapted to the uses of zoölogists, microscropists, and naturalists generally, as it enables them to prepare their own illustrated plates at minimum expense.

Potato Bug Cure.

Many different means have been tried to destroy the beetle, but without effect, until the present method was found, and this method is so effective and so cheap, that he must be a very careless farmer who still lets his potatoes be ruined. It is the following: Take 10 lbs. of lime and mix it well with 1 lb. of Paris green, which is in no way deleterious to the potatoes, giving 11 lbs. of mixture for each acre. Get a small wooden box, 10 inches by 8 inches, and 6 inches deep, and nail a piece of millcloth, as used for sifting by wheat millers, instead of a wooden bottom beneath, also a piece of lath across the middle of the open top as a handle for shaking the box. Every morning from 5 to 9 o'clock or longer, as long as the dew is on the plants, this mixture has to be applied. Children of 8 to 12 years can easily do it, by putting about one pint into the box and sprinkling it as dust by slow shaking on the leaves of