New Inventions.

Oil Used on Railroads.

We are indebted to Edward H. Jones, master mechanic, Albany, N. Y., for tables of the quantity of oil used by each engine on the different divisions of the Central Railroad, New York, during the month of May last. The following is the gross amount used on each division of the road.

Divisions.	Miles run.	Pints oil used.	Mls. run to 1 pint oil.
Albany and Utica, -	49,988	3,624	13 4-5
Schenectady and Utica,	39,035	4,055	9 5-8
Troy and Schnectady, -	8,162	1,048	7 4-5
Syracuse and Utica -	39,265	3,266	12
Syracuse and Rochester	78,659	5,804	13 1-2
Rochester & Buffalo and Roch'r & Niag. Falls,	102,676	11,637	8 5-6
Total - - - - -	317,785	29,434	10 4 5

It will be observed by our readers that there is a very great difference in the quantity of oil used on the different divisions of this road, the distance run on the Albany and Utica section, to one pint of oil, being nearly double to that on the Troy and Schenectady branch. There must be some reason for this; is it the fault of the track? We find in the particular tables, giving an account of the performance of each engine, that there is also a great difference in use of oil, by different engines. Thus, on the Albany and Utica division, the engine *Mechanic* only run 6 4-7 miles with one pint of oil, whereas *No.* 22 run 22 1-6 miles—more than three times the distance. How is this to be accounted for? Is the fault in the engine or the engineer? On the Utica and Schenectady division we find a still greater difference between the performance of two engines with one pint of oil; thus, *No.* 6 run only 3 2-3 miles, while *No.* 65 run 14 1-3—more than four times the distance. On the Syracuse and Utica division, engine *Oneida* consumed one pint of oil every 4 7-8 miles, while the engine *Mars* run 15 1-4 miles. On the Syracuse and Rochester division, the engine *Thayer* run only 3 3-5 miles with one pint of oil, while engine *No.* 51 run 16 3-4 miles—about five times the distance. On the Rochester and Buffalo and Rochester and Niagara Falls division, the engine *Orleans* consumed one pint of oil for every 3 2-3 miles run, while the engine *W. W. Corcoran* run 26 miles with one pint of oil—eight times the distance. We have taken the minimum and maximum performances of engines with one pint of oil. We cannot well understand why the *W. W. Corcoran* should run 836 miles, and use only 32 pints, while the *Orleans* should run but 720 miles and use 196 pints. Some reliable information relative to the causes of such discrepancies in the use of oil on different engines, would be of great value to the railroad interests of our country. The master mechanics can form the best opinions on this subject, because they know the capacity and condition of each engine—the track on each division being the same for all. The plan of keeping separate accounts with the engines, relative to repairs, oil, and fuel, is a good one, and will no doubt result in a great saving to all the railroads which pursue the system.

Ships' Pumps.

The accompanying figures (1 and 2) are vertical sections of an improvement in ship pumps patented by Alexander Kirkwood, of Pascagoula, Mississippi.

The nature of the invention consists in forcing the bilge water out at the bottom of a vessel, instead of raising it above the level of the water, in order to save the labor of raising it.

Figure 1 shows an oblong box about six inches wide, 4 deep, and 14 long. It is made with transverse partitions, which thus divide it into three compartments. B and B' represent a valve on each partition. Holes or openings, *a a a*, are made in the bottom of the box, near one end, and other openings, *d d*, near the other end. The box is secured to the inside bottom, D, of the vessel by screw bolts, in such a manner as to allow the bilge water at the recess, W, to pass up into the box through the openings, *a a a*. The water is discharged through the tubes, *d d*, which are screwed and fitted water-tight in the bottom of the box, and pass through the bottom of the vessel. These pipes are fitted with stop cocks to close the communication, when required, between the box and the water on the outside of the vessel. J is a cylinder or large tube bolted to the box, in which works a packed piston, C, the rod, *h*, of which passes up and is operated by a lever in the common way.

When the piston, C, is drawn up, the water will flow up into the box through the openings, *a a a*, as shown by the arrows, 1 1 1, then through the valve, B', into the compartment, A. When the piston, C, is forced down, the valve, B', closes, the one B opens, and the water is forced down tubes, *d d*, out of the vessel through its bottom, as shown by arrows, 2 2.

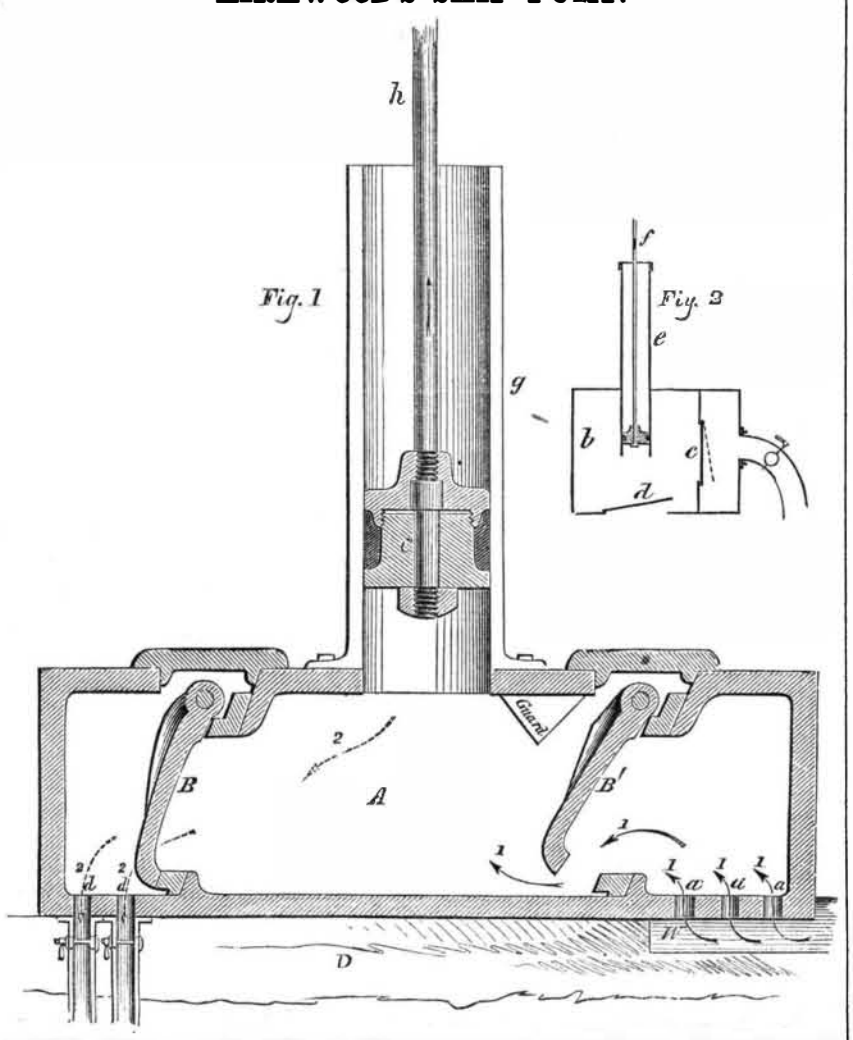
The box and pump are easily shifted, taken apart, and put together.

Fig. 2 is a modification of fig. 1, with a box, *b*, deeper but not so long. It is bolted to the vessel's inside bottom in such a manner as will allow the bilge water to flow under it. *e* is its piston cylinder, and *f* its rod. *d* is the inlet valve placed on the bottom of the box, and the outlet valve, *c*, on one partition. It saves one partition in the box, and is more simple than fig. 1. It is a force pump, and in this respect differs from the marine chain and lifting pumps. It is a simple and convenient force pump for the purpose.

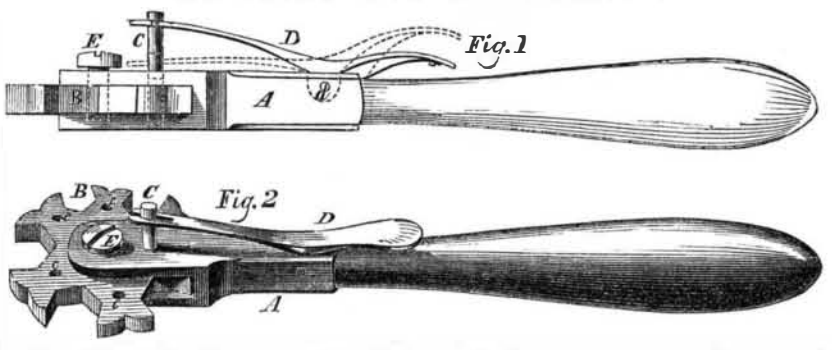
The claim is for "the attachment of the foregoing described pump, or of any ordinary force pump, to the bottom of a vessel, so as to force water out at her bottom, thereby avoiding the labor and expense of raising the bilge water above the level of the water in which the vessel floats."

More information may be obtained by letter addressed to the patentee.

KIRKWOOD'S SHIP PUMP.



BRISTOL'S ROTARY WRENCH.



The accompanying figures represent a rotary Wrench invented by C. B. Bristol, of Naugatuck, Conn. Fig. 1 is a side elevation, and fig. 2 a perspective view of the tool, A. Its head is composed of a number of jaws, B, to suit different sizes of nuts. It is fixed on a center pin, E, which secures it between two plates, and on which it turns, to bring any jaw suitable to operate the nut into the proper position for work. There are a number of holes, *c c*, in the rotary jaw head for holding the jaws firm in place by pin C; this pin is operated by the small spring lever, D. By pressing with the thumb on the spring at D, the pin, C, will be raised out of a hole, *c*, and the rotary head of the wrench can be turned round with the left hand, to bring the proper jaw into place. When this is done, the thumb is raised from lever spring, D, and pin C is pressed into its hole *c*, and holds the jaw head firm. Fig. 1 shows the spring lever, D, and its fulcrum, *d*, in two positions, to illustrate how pin C is operated. No further description is necessary to explain this convenient tool. Every mechanic will understand it at once.

More information respecting it may be obtained by letter addressed to Mr. Bristol.

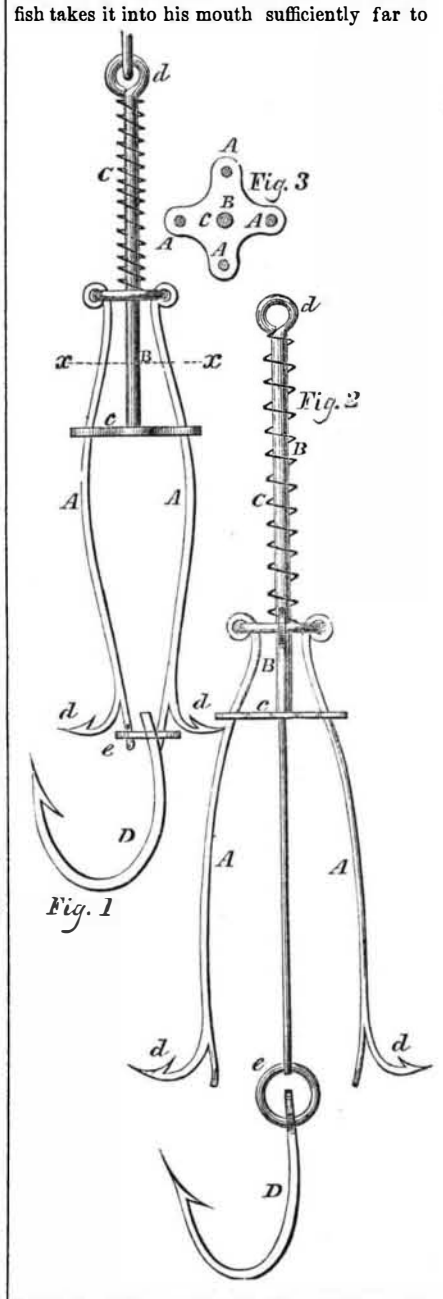
New Patent Fish Hook.

The accompanying figures represent an improved fish hook, for which a patent was granted to Richard F. Cook, of Troy, Pike county, Ala., on the 19th of June last. The invention relates to the kind of hook known as the "Sockdologer," and used especially for catching large fish; and the object of the improvement is to render the hook more certain in action, and capable in every instance of catching and holding the fish securely the moment it takes the bait hook, and points of the spring or barbs into its mouth and pulls slightly.

Fig. 1 shows the hook ready for fishing.—Fig. 2. shows it unset, and fig. 3 is a plan view of the adjusting ring plate taken at *x x*, fig. 1. Similar letters refer to like parts.

A A A A represent four light steel strips or rods made bow shaped, so as to be elastic, these rods are attached loosely to a ring or plate, *a*, by their upper ends, and have barbs or hooks, *d d*, found at right angles on them near their lower ends, in the manner represented. B is a small vertical rod passing down through the ring or plate, *a*, between the strips or rods, A A A A, and connecting fast with a horizontal plate or collar, *c*, which confines the strips, A A A A, as shown in fig. 3. C is a spiral spring placed round the rod, B, between the ring or plate, and the ring, *d*, at the upper end of the rod, B. D is the bait hook, it is connected to the lower end of one of the strips by a ring, *e*, and hangs a short distance below the barbs or hooks, *d d*, as shown.

Operation—Suppose the hook to be s shown in fig. 2, and it is desired to set it ready for fishing, as shown in fig, 1, the ring or collar, *c*, is moved down from the position shown in fig. 2 to the position shown in fig. 1, and held so by the elasticity of the strips; this causes the lower ends of the spring strips, A A A A, to move close enough together to allow the ring, *e*, to be placed round them as shown. The hook is now ready for use, and after being baited is let down into the water. In case a fish takes it into his mouth sufficiently far to bring the barbs or hooks *d d*, between his jaws, and then pulls slightly upon the bait hook, D, it will be sprung, as shown in fig. 2, or unset, and the barbs, by the action of the spiral spring, C, caused to move laterally from each other, and consequently take into the top, bottom, and sides of the fish's mouth, and confine him securely, and thus relieve the bait hook of nearly all the strain.



Having the lower ends of the steel strips carrying the barbed hooks move towards each other in setting the hook, and from one another when the hook is sprung by a fish, constitutes the invention. By this arrangement the barbs are brought into nearly as small a compass as that occupied by the bait hook, and thus causes the fish to take them with the bait hook into his mouth, and place himself under the immediate action of the barbs, the moment the bait hook is pulled slightly. Whereas in other hooks only the bait hooks enters the fish's mouth, and very often the fish gets loose before the spring relief hook comes in contact with him. More information may be obtained by letter addressed to the patentee.