

Science and Art.

Compasses in Ships.

Many persons, and among the number, seamen, embracing most commanders of vessels, we understand, entertain the notion that the magnet or compass is not affected by local attraction, like a cargo of iron, if the latter is covered with some non-conducting material, such as dry tarpaulin. This is a great error, and one which we have no doubt has been the means of causing many fatal mistakes in navigation. Magnetism is different from a current of electricity in the important particular, that the attraction of the former is not affected by the interposition of glass or an insulating material. Place a magnet or compass inside of a glass vase, and it will be affected by the presence of iron on the outside of the glass, just as if there were no such medium between them. The atmosphere itself, if dry, is a superior non-conducting medium to glass, therefore the interposition of a tarpaulin (laid on the top of iron) between the compass and attractive cargo, is of no use whatever.

There is one method, however, of obviating local attraction to a great extent on board of vessels, and it can be brought into use by every sea captain, that is, to remove the compass as far as possible from the cause of local attraction. Thus, if it is found that the compass is affected by the presence of an adjacent body of iron, if the latter cannot be removed to a greater distance, then take the compass away from it. If it is attracted by a cargo of iron, remove the compass to some position as high up on the mast as possible; and it is our opinion that every ship should carry a compass on its mast as well as one on the quarter-deck.

The attraction of magnetism is inversely according to the square of the distance. Thus, if the force of magnetic attraction is equal to four pounds at the distance of one foot from the magnet, it is but one pound at the distance of two feet. From the consideration of this law of magnetism it will easily be perceived that the greater the distance between the object of local attraction—such as a cargo of iron, the hull of an iron vessel, or the engines of a steamer—the disturbance of the magnet's true action is greatly lessened in proportion.

New Potato Planter.

In planting seed potatoes it is desirable that they should be deposited in the freshly-opened furrow at regular distances apart, and instantly covered by the freshly dug earth and manure; and the object of the machine of which we give a perspective view in the accompanying engraving, is to accomplish these results by the action of cheap and simple devices, not likely to get out of order.

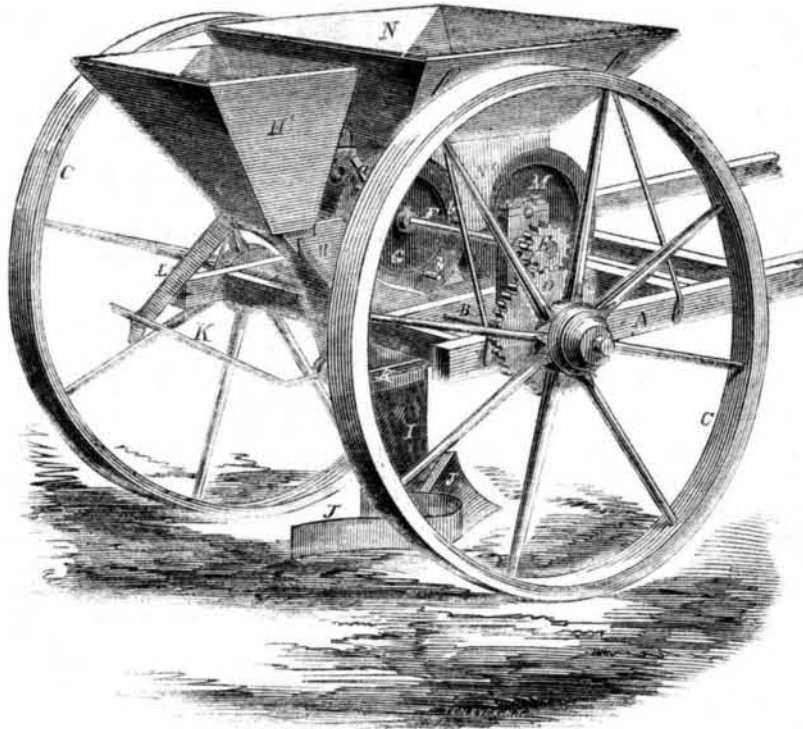
A, in the engraving, represents a horizontal frame, provided with suitable shafts for drawing the machine, and sustained on a shaft, B, on whose ends turn traveling wheels, C, to the hub of one of which is secured a cog wheel, D, meshing in gear with a pinion, E, immediately above, secured on the end of a horizontal transverse shaft, F, turning in suitable boxes secured to the frame, and having a planting wheel or roller, G, attached to its opposite end. To the frame, A, in the rear of the planting wheel, G, is secured an inclined trunk, H, communicating with the upper end of a canvas or other tube, I, terminating immediately behind the mold board of a plow, J', from which extends a covering blade, J. This plow can be raised or lowered to regulate the depth of furrow, or to entirely clear it of the ground, when it is desired to transport the machine from place to place on its wheels, by means of a bent lever, K, which, when the plow is raised, can be fastened in a notch formed in an elastic bar, L, secured to the hopper, H'. This hopper is for containing gypsum, phosphate of lime, bone dust, or other compost, and it is arranged above the

trunk, H, and is provided with a rising and falling gate in the front part of its lower end, to which is attached the end of a bent lever, a, turning on a fulcrum at its bent portion, and extending downward tangentially to the planting wheel or roller, G, in such a manner as to cause this lower end to be operated upon by pins, b, projecting from the side of the said planting wheel or roller, G, during its revolu-

tions, and to raise the gate, and allow the escape of a certain quantity of compost from the hopper into the trunk, H, and tube, I, upon the passage of each pin, b, in front of the bent lever, a, the sliding gate being closed by its own gravity, as soon as its bent lever, a, is disengaged from the said pins, b.

Directly in front of the planting wheel, G, is arranged another wheel, M, whose peri-

HAWLEY'S POTATO PLANTER.



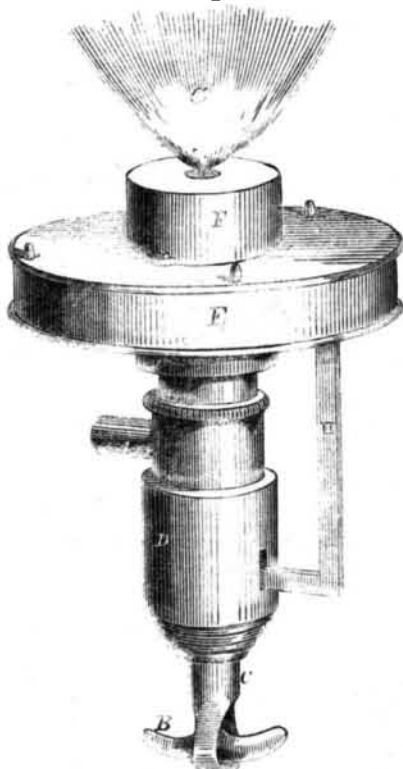
phery is in contact with the periphery of the planting wheel, so as to enable the two to turn together, and immediately above the portions of these wheels next each other is secured a hopper, N, on the front part of which is secured a knife, whose cutting edge is brought in tangential relation to the periphery of the planting wheel or roller, G, so as to cut off any portion of the seed potatoes in the openings or indentations of the same, and thereby bring them to one uniform size.

This is a compact, ingenious, and useful machine, and by the simple alteration of the pockets or indentations in the periphery of the

planting wheel, G, and other parts, it can be adapted to planting corn, beans, and other seed. It can, moreover, be transported on its wheels without operating the planting wheel and other parts, by detaching the pinion, E, from gear with the cog wheel, D, and if desired, the planting wheel can be operated without moving the slide in the hopper, H', to drop compost therefrom.

A patent was issued for this invention on the 9th of February, 1857, to E. E. Hawley, of New Haven, Conn. Any further information can be had by addressing this gentleman or R. N. Hawley, at that place.

Self-Closing Burner.



Many very serious accidents have arisen from careless manipulation of the gas cock, and fatal explosions have frequently resulted from taking a light into a room full of gas. Persons have also been suffocated by sleeping in rooms where gas has been leaking all night,

and notwithstanding the very general use of gas as a means of illumination, there are yet very many innocent persons who are not aware of its nature, and often when, for the first time, they see a gas burner in their room at an hotel, before retiring for the night they blow it out, being totally unaware of the use of the cock. With pleasant dreams they fall asleep, and the visions of the night gradually take the shape of a kitchen—cooking is going on—the cook becomes drowsy—the meat burns—and the slumberer awakes with the unpleasant sensation of an actual, not imaginary, bad odor being diffused through his room. The first thought is the gas, nightcap, stockings, pantaloons—anything to tie it up—and again *rusticus* retires to the arms of Morpheus, dozing off with thoughts of the wonderful inventions which are used in cities. This is no ideal case, but one that can be corroborated by the experience of nearly every large hotelkeeper, and many housekeepers who have had friends staying with them who did not understand the nature of gas. We had a country clergyman staying with us on one occasion, who blew the gas out, and the moment his wife perceived the smell, she jumped out of bed, and with frantic energy tied her nightcap over the burner, and then, thinking all was safe, she retired to rest.

It needs no assurance from us to convince every one of the extreme danger of such accidents, and we are happy to be able at the same time to point to a gas burner which will close itself the moment it is blown out, so that no accident can happen from the ignor-

ance of individuals, or the light being extinguished by a sudden draft.

Our illustration is a perspective view of it, in which A is the branch pipe which supplies the gas to the burner; F is an air chamber flush and smooth with the top of the burner, and E is a case containing some mechanism. When it is desired to light the gas, the cock, B, is pulled down in the loop, C, and in that position it distends a spring in D, the tendency of which is to pull it up and close the communication between the burner and the supply pipe, but the cock is held down by a catch connected to the bent arm, H. The gas being ignited at G, the air in F is heated, and the consequent distention of the chamber by the mechanism in E holds H so as to allow the gas to pass freely to the burner. The moment, however, the flame is extinguished, the air contracts in F, the mechanism is released, and H is drawn from holding the valve open, the spring in D pulls up B, and the valve is closed, the whole being then perfectly safe. It is so constructed that the self-closing arrangement can be used only when thought necessary, and with or without a cock in the gas-pipe.

It is the invention of A. R. Marshall, of Stratford, Conn., and was patented by him Aug. 26, 1856. Mr. M. will be happy to furnish any further information upon being addressed as above, and we can sincerely recommend his invention to all gas consumers.

COAL PIT.—The deepest coal pit in Great Britain, and probably in the world, has just been completed and opened at Dukinfield, Cheshire. The shaft is 686½ yards deep, and the sinking of it, which has occupied nearly twelve years, has cost about \$500,000.



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