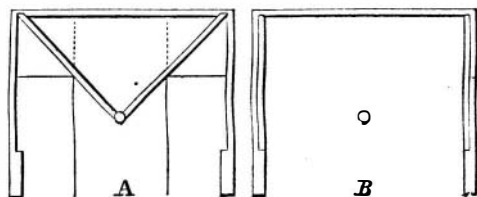


PROTEUS--THE NEW OPTICAL DECEPTION.

We now redeem the promise made in our impression of the 5th ult., by describing and explaining an optical illusion, which, although simpler, is at first sight more astonishing than the famous Pepper's "ghost," and owes its origin, in some degree, to the same source. A cabinet—not unlike a sentry-box in form, although somewhat wider and deeper—is brought in on the stage before the spectators, who must be seated in front, and at a moderate distance from it. It is so arranged that the spectators can see underneath it, to prevent the idea being entertained of any possible communication with trap doors in the stage. The door is opened, and a lamp is let down through the roof (railway carriage fashion), by which the interior is plainly seen. Nothing appears inside but a pillar of the apparent diameter of three or four inches, reaching from top to bottom. The sides and back of the cabinet are papered or painted to imitate wainscot.

A gentleman is now requested to step in and allow himself to be locked up for a brief space of time. This is done, and in about a minute after, on the door being opened, out steps "Venus," not draped in the scanty habiliments in which Grecian sculptors have been accustomed to represent that lady, but arrayed in true West-end style, with satin skirts distended by means of crinoline over an area of some yards. She disappears at a side door, but presently reappears stating that she has forgotten "Cupid" in the cabinet behind her. On the door being opened, "Cupid," armed with his bow and arrow, springs out, and, making his bow, walks off with his Ma. Various other changes are effected—such as people entering, and being found, on the door being opened, to have disappeared. Lastly, at the close of the entertainment, an inspection of the interior is invited.

To enable our readers to understand how this optical deception is produced, let them follow us for a moment:—



A and B are ground plans of the cabinet, from which, for the sake of convenience, we have removed the doors. In A two doors, hinged at the back corner, open from the sides and shut up against the pillar in the center. One side of these doors is composed of a plate-glass mirror, the other of wood, painted or papered. When the doors are in the position shown at A, any person may be hidden behind them concealed from the spectators, who are quite unable to discover that they are there, believing, as they must necessarily do, from the evidence of their eyes, that the cabinet is empty. This belief is caused by the mirrors being placed at the proper angle, by which the sides of the cabinet are reflected forward, and appear, as in the dotted lines, to be as far behind the mirror as they are really distant from it at one side. The sides, therefore, by the simple law of reflection, appear to be the back, and when the outer door is closed, any one concealed behind the mirror-faced doors may easily pass from behind them to the front, and step out on the outer door being opened.

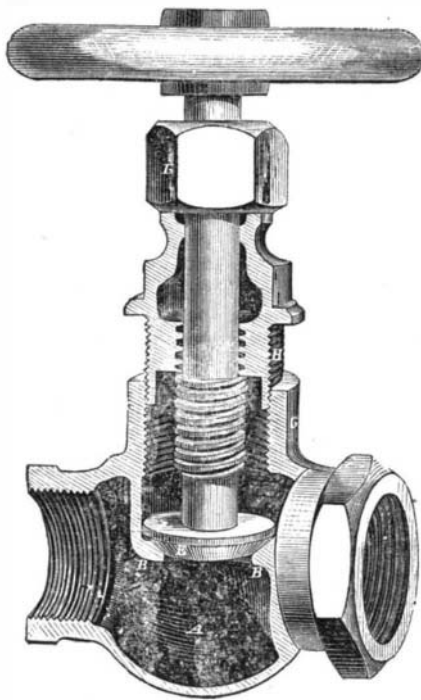
Before the last person comes out he carefully folds back the mirror-doors which fit neatly into a recess in the sides; and, as the back of these mirrors is made of wood, and painted the same color as the back of the cabinet, it then assumes the form represented in B in our diagram, when any one of the spectators may be invited forward to examine if it be not really, what it seemed all along to be, an empty cabinet.

This is one of the neatest optical illusions which we have seen, and is even enjoyed better after a knowledge of how the deception is effected than before. It has been invented and patented by Messrs Pepper and Tobin.—*British Journal of Photography*, Feb. 2.

THE whole amount of fractional currency in circulation is not far from \$30,000,000.

CHESLEY'S GLOBE VALVE.

In all newly-constructed steam engines or steam apparatus of any kind, sand and scales become loosened from the inside of the castings and pipes forming the steam passages; and in old ones incrustations and scales from oxidization form and become detached, and are frequently lodged between the valve and its seat, permitting the steam to leak in the valves.



Unless such valves are again accurately fitted to their seats by regrinding, the steam soon cuts into them deep grooves and channels. The trouble attending this operation, in ordinary globe valves is so great that it is generally neglected until great loss is incurred by waste of steam, and sometimes serious incidental damages.

The valve here represented is so constructed as to completely overcome these difficulties, and thereby render it of great value to every one using steam.

The following explanation will render its operation easily understood:—In the ordinary globe valves the interior screw-threaded portion of the raised rim or boss, G, and the exterior screw-threaded portion of the hub, H, are constructed of just such length that they can only be employed to hold the parts together, and they become entirely separated in the act of unscrewing, before it is possible to disengage the screw on the stem of the valve, E, from the interior thread of the hub, H, in which it works. And hence, when the valve requires regrinding it is necessary to strip the wheel or handle from the stem, remove the hub, H, and substitute a false one, in which a smooth cylindrical perforation takes the place of the interior screw thread of the hub proper, frequently involving the necessity of disconnecting the valve from the pipes or boiler and a trip to the shop. This is avoided in this valve by the plan here described. Instead of terminating the exterior threaded portion of the hub, H, in just sufficient length to hold it to its place, it is prolonged downward, forming an annular rim which incloses a recessed chamber, as shown in the engraving. The boss, G, is also prolonged upward to correspond with the hub in the number of its threads.

This construction enables the hub, H, to be instantly converted into a stem guide by simply screwing it back to the position shown in the engraving, and then screwing the valve, E, forward sufficiently to release the screw thread of its stem from that of the hub, H. In this condition for regrinding, the stuffing box, I, and the ridge of the interior thread of the hub, H, serve as upper and lower guides for the smooth portion of the valve stem, which they hold to its true center, and yet freely permit the rotary and longitudinal motion commonly employed in grinding valves to their seats.

In this improvement the valve stem is guided in the act of grinding by the same parts which serve to hold and guide it in actual operation, so that the chance of disparity between different guides and change of centers is avoided.

This invention was patented on Oct. 3, 1865, by Wm. Chesley. These valves are kept constantly on hand and all orders promptly filled by the Greenwood Pipe Co., corner of Canal and Walnut streets, Cincinnati, Ohio. Parties desirous of obtaining rights to manufacture can address the inventor, Wm. Chesley, care Greenwood Pipe Co., Cincinnati, Ohio.

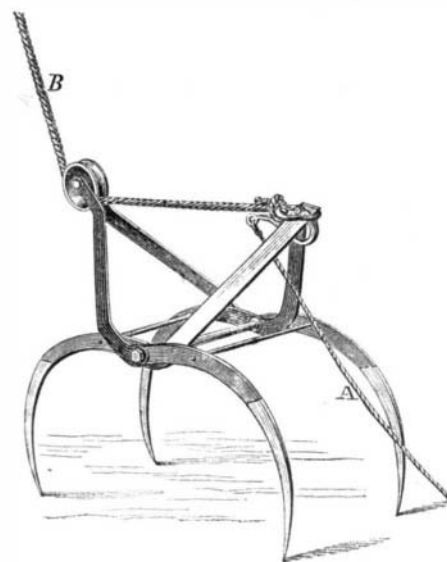
GARRETT'S HAY FORK.

As the haying season approaches those interested in relieving themselves of some of the hard work common about that time, will be glad to know where they can obtain the most approved machinery. The power hay fork is certainly entitled to much consideration, for in the list of labor-saving tools there are none more valuable.

The one here illustrated is entirely without machinery; that is to say, it has no ratchet teeth, springs, or other devices, but loads and unloads by a simple direct pull on a rope. The points of the fork are always down and work from below, grasping the hay as a man would with his fingers, taking a good load each time. The forks are opened by a pull on the line, A, and hoisted by the other one, B, running on the pulley; this action also draws the forks together, so that they hold the hay between them.

The manufacturers claim that this is a light, durable, and easily managed tool, that it has no projecting points to catch in beams, and that for its office it has no superior. It will elevate barley or oat straw without scattering. The steel in this implement is all made to order and cut in lengths so as to prevent welds.

In order to use the fork the operator steps on the axle, which causes it to enter the bay; he then places the link, which is attached to the end of the rope, B, over the hook, as shown; as the rope tightens the fork will firmly grasp its load, when it is elevated to the proper point, a slight pull with the little finger



will cause it to discharge its load. The fork is warranted to elevate hay as fast as any other, if properly managed. No pay is required until the purchaser is convinced of its merits. The manufacturers have orders now for nearly a thousand.

Patented by D. M. Garrett, of Shelby, Ohio, Aug. 29, 1865. For further information address Billow, Garrett & Co., manufacturers, at that place.

PLANTING FLOWER SEEDS.—Sow hardy annuals about the 5th of April. Press a bowl, edge downward into the earth, until you have made a circular drill to the required depth, and plant the seeds in this drill. You may then bury any special manure in the center, and there place the label; when grown, the stalks of the flowers will form a circle, and the effect and mutual support of both will be improved.

CRUDE saltpeter cannot be used in the manufacture of gunpowder. The crystalline flour, quite free from chloride, is the best material for the purpose. In France, the amount of chloride is not allowed to exceed $\frac{1}{3000}$. At the Waltham Abbey mills the washing process is carried so far that nitrate of silver produces no precipitate in a solution of the purified saltpeter.