

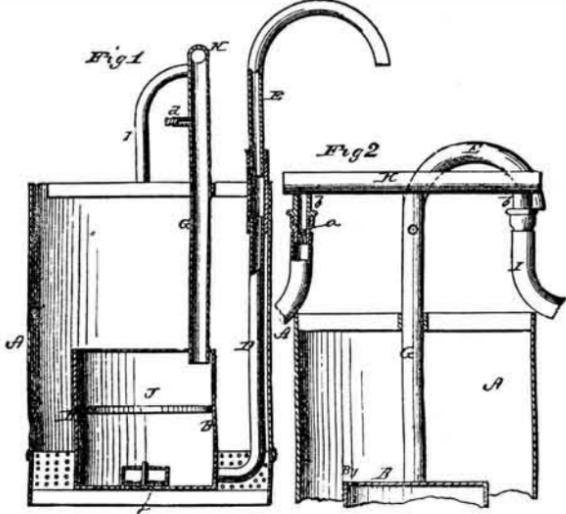
with great success. Probably with this arrangement and a deflector over the fire-hole, as good results in the combustion of coal can be obtained as with any means now in use. We are inclined to believe, however, that if, instead of leaving the opening for the flame above the fire-brick the whole width of the fire-box, it was contracted to about the size of the fire-hole, better results could be obtained. A water grate is used with this system, and, we believe, on all the engines on that line.—*Railroad Gazette*.

**SUPPLYING LOCOMOTIVES WITH WATER.**

By HENRY HOWE, Council Bluffs, Iowa.

A TANK submerged in a well, is provided with suitable pipes, so arranged that the steam from the locomotive may be admitted into the tank, thus forcing the water up into the tender.

Within the well, A, immersed in the water, is a tank, B, with valve, C, in the bottom. From near the bottom of this tank a pipe, D, extends above the ground, and has a swiveled spout, E, through which the water is forced out into the tender; this swiveled spout can be turned out of the way of the track after using. From the top of the tank, B, extends a pipe, G, above ground, at the top of which pipe is a cross-pipe, H, and at or near each end of this cross-pipe is a nozzle,

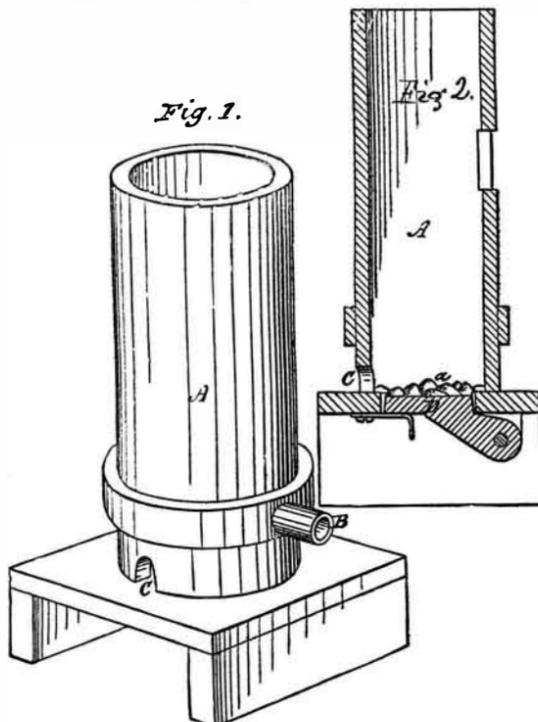


b, to which a flexible pipe, I, is attached. In each nozzle or connection b is a check-valve, a, of any suitable construction. Either of the flexible pipes I is to be connected with the boiler of the locomotive, so as to allow steam to enter the tank to force the water down and out through the pipe D. The check-valves a operate so that when steam is passing through one of the flexible pipes it lifts the valve on that side and closes the one at the other end. By means of these valves, also, when the pipes I are disconnected from the boiler, the steam in the tank can not escape, but must condense and form a vacuum, and cause the water to rush in and fill the tank. By having a flexible connecting-pipe at each end of the cross-pipe H, one of said pipes I will always be at the proper place for the engine in going either way. In the pipe G is a small stop-cock, d, to let the air pass out of the tank at the first filling, after which it will not be needed, as no more air can get in. In the tank B is used a float, J, in order that the steam may not come in immediate contact with the water.

**NEW PROCESS FOR IRON.**

By WILLIAM BATTZ, Philadelphia, Pa.

THE object is to facilitate the operation of melting cast-iron in a cupola or blast-furnace, and at the same time carbonizing instead of decarbonizing the "charge" of metal—the latter being the result of the usual process of melting—and also to get the highest degree of heat with the least quantity of air necessary for the combustion of the fuel.



A represents an ordinary cupola-furnace; B, tuyere-hole; C, gate or draw-off; D, hinged door at the bottom of the furnace.

In preparing the furnace for the melting-process, after closing and fastening the door D, I form a bed of charcoal below the tuyere hole B, and place the kindling thereon. I then charge the furnace in the usual manner. With the blast through the tuyere or tuyeres, I blow in the gas-carbon, or the coal-oil carbon, or both, in a finely-pulverized state—they being fed into the blast-pipe by any suitable device—the slag that forms in the furnace lying between the tuyeres and the top of the charcoal-bed, which prevents the latter burning out,

while the molten iron circulates through the charcoal and takes up such quantity of carbon as will refine, purify, and soften the cast-iron.

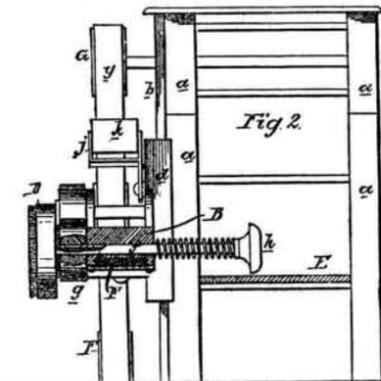
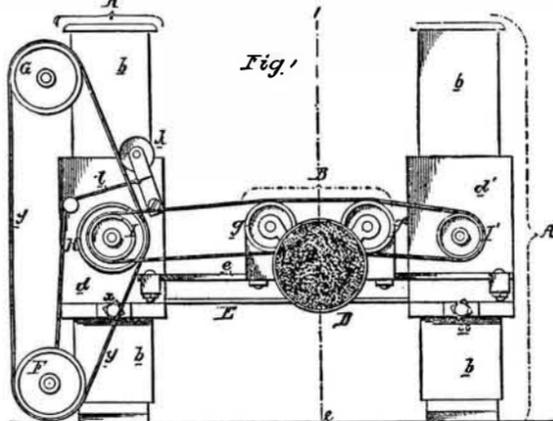
The object of blowing in the carbon is to take up the excess of oxygen in the air, the oxygen having a greater affinity for the carbon than for the iron. By this process I am enabled to get the requisite amount of heat with a less amount of air than can be obtained in any other way.

**APPARATUS FOR CLEANING BRICK WALLS.**

By J. WATERMAN, Philadelphia, Pa.

THE means which I prefer of applying power to the cleaning-brush D are shown more fully in Fig. 1, in which F represents a pulley secured to a driving-shaft, which turns in bearings on the lowermost section of one of the end-frames A, a similar pulley, G, being secured to a shaft carried by the uppermost section of said frame, and the driving-belt y passing round both these pulleys and round a pulley, H, the shaft of which turns in bearings in the end-piece d, and carries at its outer end a smaller pulley, I. The opposite end-piece d' also carries a pulley, I', similar to the pulley I, and a belt passes round the pulleys I and I', and over and between the pulleys g, g', and g'', carried by the sliding carriage B, the pulley g communicating motion to the spindle of the brush D.

A hinged arm, j, is secured to the end-piece d, and carries at its outer end a roller, k, which can be moved inward against the belt y, by drawing upon the cord or chain l, so as to increase or diminish the tension upon said belt.



The spindle f has at its inner end a knob, h, by pressing upon which the attendant, standing upon the platform E, can force the cleaning-brush D against the surface of the wall to be operated upon, a spiral-spring, i, tending to remove the brush from contact with the wall, when pressure is removed from the knob.

The end-pieces d d' of the brush-carrying frame have jaws at each end, which embrace the edges of the guiding-plates b, so that the said frame can be adjusted vertically to any desired position, set-screws x serving to secure the same in place after adjustment.

The revolving-brush D consists, preferably, of a disk, in which are inserted a number of short pieces of wire; but any device which will have a scraping or scratching effect on the surface of the brick or stone may be employed, or a bristle-brush and water may be used when a painted wall is to be operated upon.

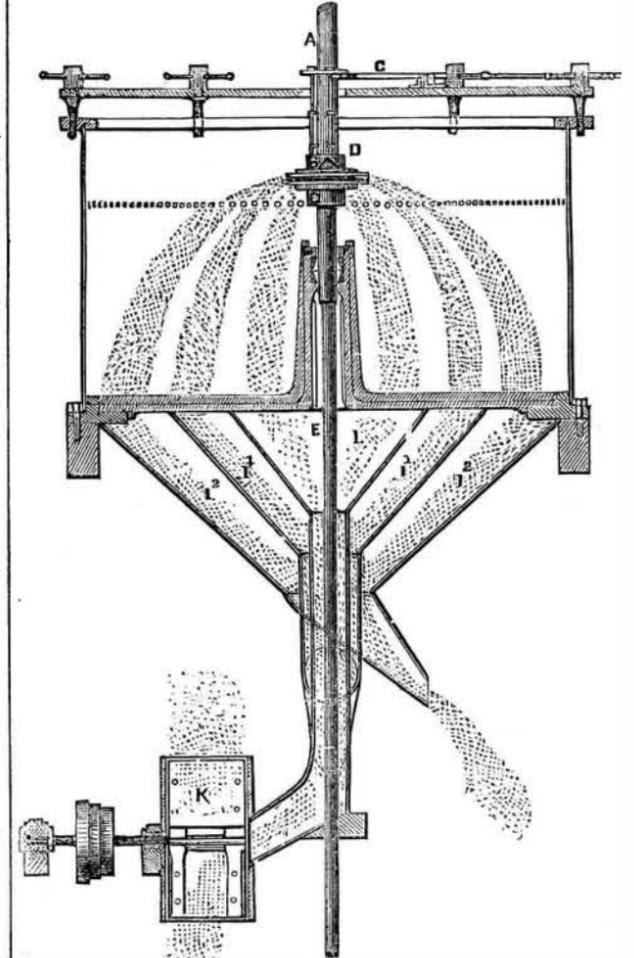
The above-described apparatus can be made of any desired width or height, and is intended to be erected in proximity to the wall of a building to be cleaned, in the same manner as a painter's scaffold, every part of the wall being rapidly and effectively operated upon by the brush D, owing to the ready adjustability of the latter.

**SEMOLINA.**

MR. BUCHHOLZ, in his specification for an "Improved apparatus for manufacturing and assorting semolina, and reducing same to flour," describes the following curious machine for separating bran from semolina, and at the same time separating the light from the heavy particles of semolina by means of centrifugal plates, etc.:

"In order to assort the grains of semolina according to their qualities, and remove the bran therefrom, I use a novel kind of centrifugal machine (see sketch), which is shown in sectional elevation. This may be described as follows: A hopper (not shown in the drawing) is provided for receiving the material to be assorted. The pendant discharge-tube (A) of this hopper is fitted at bottom with a valve (B), which represents what I term the spreader, to be more particularly referred to hereafter. The valve (B) is capable of vertical adjustment by means of a balanced rock-lever (C), to regulate the flow of the material from the hopper into the assorting machine. The semolina, with the bran, falls from this hopper into the spreader before-mentioned, which consists of a rotating chamber, in the periphery of which are openings to allow of the discharge of the material horizontally, and its consequent descent nearer to or farther from the axis of rotation of the spreader, according to the specific gravity of the individual particles. The rotating chamber admits of some modification in its construction, as will be hereafter noticed. It is composed of two main parts (D, D'); an open cylinder of wood (D) with a flange at bottom is set over a flanged boss (D'), also of wood, keyed to a vertical spindle (E). The two flanged pieces are so connected together as to leave an annular lateral opening between them for the discharge of the semolina. This connection is effected by means of steel blades inserted in vertical grooves cut radially, and at equal distances apart

in the flanges. These blades, which serve as division-plates for the annular space, are secured to the parts (D, D') by means of rings, which enter cross-notches cut in the blades, and ring-grooves formed in the periphery of the flanges. The apparatus thus constructed is mounted in a cylindrical casing, and the spindle (E) projects down through the bottom of the casing, it being held securely in place by a central-bearing



SEMOLINA SEPARATOR.

cast on the bottom of the casing. The shaft may be driven by gearing in the ordinary way. Below the casing, and connected by means of openings in the bottom with the interior, is a set of three, or it may be less or more, concentric funnels (I, I', I''), which are intended respectively to receive the assorted substances, and deliver them to proper receptacles. By the rotation of the spreader, into which the semolina to be assorted is delivered, a centrifugal motion will be imparted to the semolina, and the heavy grains discharged into the casing will fall near its periphery, and find their way into the outer funnel (I''); the lighter semolina will fall within the circle of the heavier particles, and will be discharged into the second funnel (I'), and the bran mixed with the semolina will fall nearer the centre of motion, and escape through the central funnel (I). To facilitate the operation of this apparatus, I propose to admit air freely to the cylindrical case, and to maintain a partial exhaustion in the funnels by means of an exhaust-fan (K), which I connect thereto. The semolina thus assorted I propose to reduce to flour, using the heavy or best semolina for the best flour, and the lighter for an inferior quality."

**NEW UMBRELLA-SUPPORTER.**

By E. M. ARNOLD, Houston, Texas.

A DEVICE for supporting and carrying a parasol or umbrella in such a way as to leave the hands free. The parasol may also be tilted forward or back, or to either side.

Are two rods, curved to fit upon the forward side of and pass over the shoulders of the wearer. The lower ends of



the rods A are attached or hinged to ring B, clasped around the waist. The upper parts of the rods A have a coil formed in them to give them elasticity, are bent upward, and coiled to form a socket to receive the handle of the parasol or umbrella. To the rods A are attached straps C, passed around the arms or across the breast of the wearer, to keep the said rods in place. D are elastic straps, which are attached to the frame of the parasol or umbrella, and the free ends of which are provided with loops or rings to catch upon buttons d', attached to the belt E, so that by adjusting the straps D the parasol or umbrella may be tilted or inclined forward or backward, or to either side, as circumstances may require.