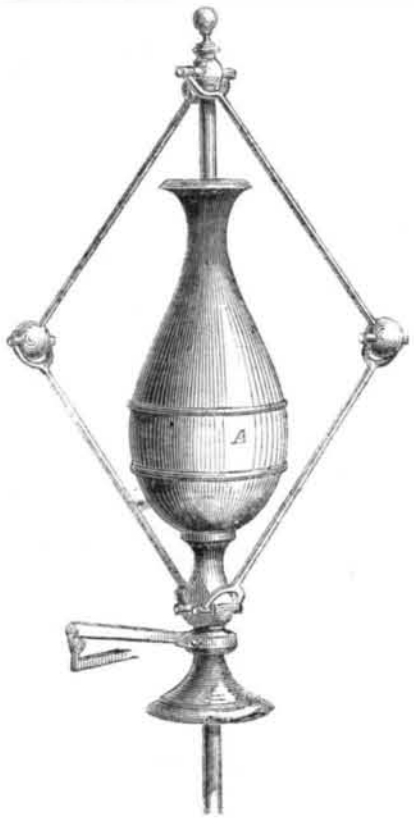
New Inventions.

Porter's Improved Governor.

The great want of the steam engine is a perfect governor. Something which can be relied upon to hold an engine always at the same uniform and steady rate of motion, however the pressure of steam may vary, or whatever sudden and extreme changes may be made in the load, is a desideratum which engineers have very generally believed would never be attained.



There are three requisites for a perfect governor. It must be extremely sensitive, so as to begin to open or to close the regulating valve instantly on the slightest variation in the speed of the engine; it must effect the whole movement necessary entirely to open or close the valve very rapidly; and a force must be developed by almost inappreciable variations in its speed sufficient to overcome all hindrancesto its action. These requirements seem at last to have been met. The improvement in centrifugal governors illustrated in the accompanyingengraving, if not absolutely perfect in its action, is so nearly so, as to leave in our opinion nothing further to be desired. The following account of the practical operation of one of these governors, under tests to which it was subjected in our presence a few days since, will speak for itself:—

It was attached to a common ten-horse power engine, with slide valves, and operated o e of Judson's regulating valves. A pressure of ninety pounds of steam was required to run all the machinery driven by the engine, twenty pounds of which was necessary to drive the shafting when the machinery was thrown off. The engine was started with just ninety pounds of pressure, driving only the shafting. The stop-valve was set wide open, and remained so during the experiments. The engine ran very steadily, making one hundred revolutions per minute. After running thus for a few minutes, the entire load was thrown on simultaneously, and as suddenly as possible. No change in the speed of the engine could be perceived by the eye, but on carefully counting the revolutions it was found that they had fallen to ninety-eight per minute, at which rate the engine worked with a perfectly uniform motion. The whole load was then as suddenly thrown off. We expected to see the engine start away, but its steady motion was not apparently disturbed at all. The count, however, showed it to have returned to its former speed. This test was repeated several times with the same result.

Watching the governor when this severe demand was made upon it, we saw that such was its quickness that it had invariably completed its action before the change in the load, however suddenly made, could be effected; and we were therefore the less astonished, when, with the closest scrutiny, we were unable to perceive, for even a single stroke, any faltering or acceleration in the motion of the engine, when the entire load was thus thrown on and off.

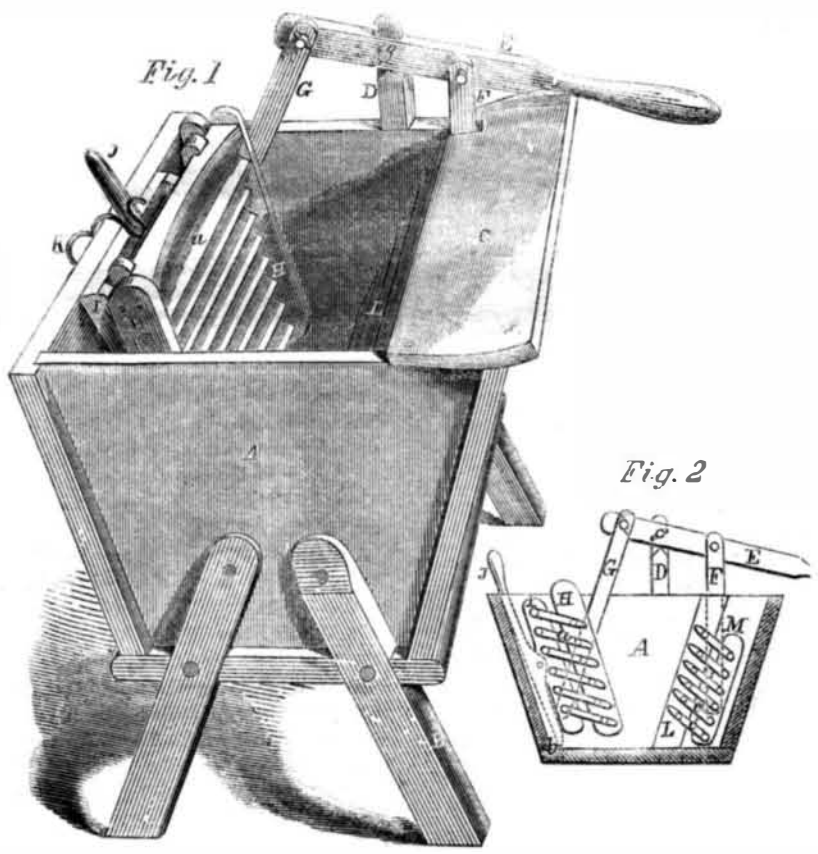
The steam was now raised to 110 pounds, without causing any change, except that under the full load, the speed fell only one per cent, instead of two per cent, as before. The engine was then stopped, and the belts removed, when it was started again with 110 pounds pressure of steam, and with no load at all even to steady its motion. Its speed was the same as before, 100 revolutions per minute. The steam was then run down, and the speed carefully noted. No change at all could be perceived until the pressure had fallen nearly to thirty pounds. It then began gradually to slacken, until with twelve pounds of steam the engine was making ninety-six revolutions.

At the highest pressure, after the belts were removed, a brake was applied to the fly-wheel, and loaded until the engine labored heavily. It was then suddenly thrown up, when the engine started considerably, and ran for about six revolutions before recovering itself. On the experiment being repeated, it was seen that the governor acted with its usual quickness, and that the acceleration of speed took place after the regulating valve was completely closed, and was caused by the steam in the chest, and passages beyond the regulating valve, expanding at its high pressure into the cylinder, where it met with no resistance. It was obvious that were this governor attached to a cut-off, even this extreme change would not affect the motion of the engine perceptibly. The pressure of steam was afterwards raised to sixty pounds, and all the machinery which could be driven at that pressure was thrown on and off with precisely the same effect as before.

These surprising results are attained by the use of the ordinary arms and balls, made very light, swinging from a single joint, the most sensitive possible arrangement, and revolving at a velocity about six times their natural speed. The centrifugal force thus generated sustains a considerable weight, A, which is required to hold the balls down to their desired plane of revolution. The appearance of this governor is such as to make it an ornamental appendage to the steam engine, and we think it will speedily come into general use, wherever steady power is an object.

It is the invention of Charles T. Porter, of this city, who has recently obtained patents for it in this country and Europe through the Scientific American Patent Agency, and who may be addressed for further information at 146 West Twenty-second street, New York. It can be seen in operation at No. 290 West Fourteenth street, near Tenth avenue.

PRICE'S WASHING MACHINE.



Very few persons now-a-days wash by hand, the number of washing boards and machines having demonstrated how much simpler and easier it is to wash by them than by hand, and consequently every new washing apparatus, however numerous they are, must arouse some attention on the part of our housewives and laundresses.

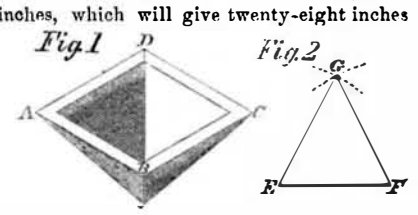
The one which is the subject of our illustration is the invention of Thos. J. Price, of Industry, Ill., and was patented by him Oct. 27, 1857.

The clothes are placed with water and soap in the tub, A, supported on legs, B, between the slats, *a* and L, by the rubbing action of the rounded edges of which the clothes or fabrics are washed. These slats, *a*, are placed like blind slats in a frame, H, and are moved back and forth by the lever, E, which, by being pivoted to a standard, D, rising from the tub and being also connected to the slats, *a* and L, by rods, G and F, gives them a vibratory motion against each other, when the lever, E, is moved up and down. The frame, H, can be retained to the side of the hub by a spring catch, K, when not in use, or can be pressed against the fabrics to rub them between the slats by the handle, J, attached to a frame which is hinged to the bottom of the tub seen at *b* in the section, Fig. 2. These slats are elongated at a portion of their backs, and this elongation is loosely attached to rods, M and I, to which the G and F, are also loosely connected so as to give the slats the necessary motion, which is one peculiarly adapted to washing, combining the rubbing action of the knuckles with the continuous certainty of a machine.

This is a very good washing machine, and further information can be obtained by addressing the inventor as above, or W. R. Downen, care of H. Fellows, San Francisco, Cal.

How to Construct a Five Bushel Hopper.

We have been requested by one of our correspondents to give instructions how to construct a hopper which will contain five bushels of grain, if one of the sides is three feet long. By the aid of the accompanying diagrams and explanation, the method will be clearly seen. Suppose the box is to be made of inch-boards and the sides are to be equal, the space inside one of the sides will be thirty-four inches, which will give twenty-eight inches



from the point where the boards join to the center of the square, A B C D, Fig. 1. Fig. 2 is one of the sides of the hopper, the distance between E F being thirty-six inches, and we have found by calculation that the sides, E G, F G, are to be 37⅞ inches long in order to make a hopper of the required size. It will be easy for any one possessing a pair of scribing compasses to lay out a triangle of the required size, by first drawing a straight line on his board, and measuring off 36 inches, and then taking 37⅞ inches in the compasses marking circles from E and F, and from the point of intersection, G, drawing straight lines to E and F. A bushel contains 2150.42 cubic inches, and a hopper constructed as described contains five times this quantity, the upper outsides being 36 inches long, the bevel making the inside 34 inches and the depth being 28 inches.

A Hard and Durable Soap.

A patent has been granted in England for an improvement in the manufacture of soap, by the addition of sulphate of lime to the usual ingredients employed in its manufacture. The sulphate may be added to the soap in a dry powder, or in admixture with any of the usual ingredients employed in the manufacture of soap. The proportions of the sulphate which it is best to employ, vary according to the article manipulated upon, and the quality of the soap to be produced. Thus about twelve ounces of dry sulphate is sufficient for one tun of best soap, whereas, in common or highly liquored soap, six or eight pounds may be used with advantage. Soap, made with the addition of sulphate of lime, becomes hardened, keeps dry, and is not liable to shrink while in water, its durability is increased, and it does not wear or waste away before its cleansing properties are brought into action.

Laying Submarine Cables.—Captain S. Samuels, of Brooklyn, N. Y., has invented a method of laying submarine cables, by passing them from the ship or other vessel from which they are to be paid out, through an opening in the bottom, as near as convenient and practicable, midway between stem and stern, where the least motion is produced by the pitching of the vessel. By this means the liability to break the cable is very much reduced, if not entirely obviated, as at a certain point in the center of a vessel's length there is comparatively little motion produced by pitching, so that the excessive and uneven strain or jerk which so much tends to rupture cables when paid out from the stern is here avoided, the danger being correspondingly lessened, and the cumbrous machinery and complicated mechanism of brakes and paying-out devices simplified and reduced. This idea has often been proposed, but Captain Samuels has been able to show the priority of his invention, and has, consequently, obtained a patent this week.

A Novel Feat.—At Amsterdam there has been a regatta of young men, who walk the water in shoes called *podoschapes*. Herr Oschner has accomplished the feat of walking up the Rhine, from Rotterdam to Cologne, where he arrived on Sunday, August 22d, having started from Rotterdam on the 16th.