NEW ECONOMICAL PAINT WITH THE OXI-CHLORIDE OF ZINC.

This paint is a mixture of oxi-chloride of zinc and alkaline solutions. There are two ways to manufacture it.

1. Take chloride of zinc prepared by the ordinary process, and free of acid; concentrate the solution so that when cold it marks 58° Beaumé. Then prepare a solution containing, for 30 gallons, 4½ pounds carbonate of soda; mix the two solutions in the proportion of 9 pints of the first for 3 gallons of the second. This liquid, so prepared, is mixed with the white of zinc, to form a paint of the ordinary consistence, which is applied immediately. Analysis shows that in the above proportion there is one equivalent of chloride of zinc for one equivalent of oxyd.

2. If you use sulphate of zinc, it must be a solution marking 40° Beaumé, and add, for every gallon, 1 ounce borate of soda. These solutions could be kept for a long time, but the white of zinc must be added only when ready for use, and you must prepare only the quantity sufficient to work one hour.

This paint gives a very fine white; it covers as well as oil painting. It is very adhesive and solid; its price is half that of the oxyd of zinc; it is without smell; it may be applied on wood, iron or cloth. It does not, however, mix well with coloring matters, and must be applied only as white paint.—*Professor H. Dussauce.*

THE NOVEL FEAT IN ENGINEERING.

Our readers may remember that our Texas correspondent described the crossing of the Brazos river, by sweeping down the bank some thirty or forty feet and rising on the opposite side. In the Richmond (Texas) *Reporter* of the 22d ult., we find the following, which we suppose must refer to the crossing described by our correspondent:—"We learn that one man, John Farrel, was killed, and the conductor, Mr. Adams, and Mr. Brush, were wounded, the latter seriously, by the following sad occurrence:—Yesterday, as the up train was passing over the Brazos bridge a portion of the bridge gave way, and a freight, baggage and lumber car fell through, making a total wreck of them. The passenger car, containing quite a number of passengers, was only saved from precipitation into the river—where all wonld inevitably have been lost—by the disconnection (from the concussion) of the locomotive from the train."

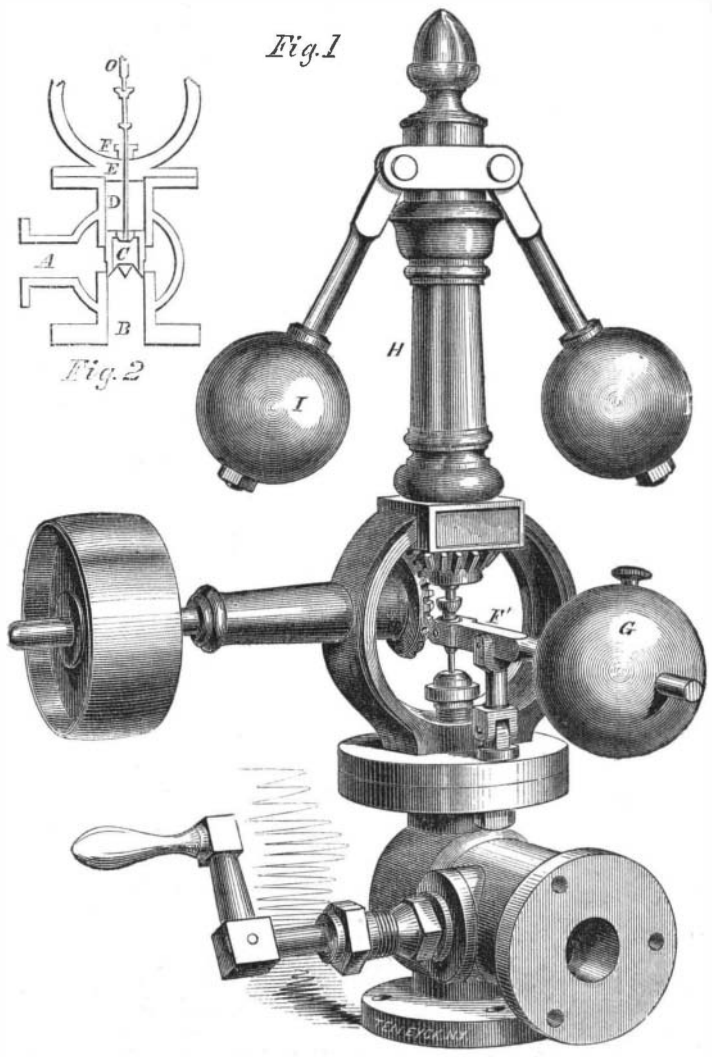
GREAT FEAT OF THE BLANDY STEAM ENGINE.

As our readers may remember, we presented in our last volume, on page 273, an illustration of the steam engine manufactured by H. and F. Blandy, at Zanesville, Ohio. By the Ohio papers we see that at the great trial of portable steam saw mills, at the United States Fair at Cincinnati, the Blandy mill distanced all competitors, performing the unparalleled feat of sawing 675½ feet of lumber by single lines, in 8 minutes 15 seconds. This mill employs two saws, one above the other, but both cutting in the same line, so that only one board is sawed at a time. We hear of these admirable mills all over the country, from New York to the interior of Texas. An advertisement of Messrs. Blandy may be found in our advertising columns.

SAWDUST AS A BEDDING AND AS MANURE.—"Dry sawdust," says a coreespondent of the *New England Farmer*, "is one of the best articles for bedding horses and cattle, to take up the urine and keep the cattle clean. But hard wood is the best, and should be used freely for bedding, even if you have to go miles for it; it will answer every purpose of going to Peru after guano." Such sawdust put on land right from the saw, especially on a thin, dry soil, is of considerable value, as an experiment mentioned by the writer above quoted proves.

IMPROVEMENT IN GOVERNORS FOR STEAM ENGINES.

In steam engine governors, of all kinds, there are necessarily a number of separate pieces, acting on each other by means of numerous joints, sliding surfaces and bearing surfaces, all of which, in order that the governor may not be impaired in its action, and not have its sensitiveness diminished by undue friction, must have a certain degree of looseness, the whole of which, combined, makes up a considerable quantity of "lost motion," as it is called, which the governor must take up before a change in its velocity will act upon the valve. It is the intention of the invention here illustrated to obviate this difficulty, and thus give greater promptness to the action of the governor.



GARDNER'S GOVERNOR FOR STEAM ENGINES.

In our illustrations, Fig. 1, is a perspective view of the whole governor, and Fig. 2 is a vertical section of the valve and its connections; *a* is the pipe leading from the boiler; *b*, the opening into the steam chest; and *c*, the valve, with openings through its upper part into the chamber, *d*, above it, so that the pressure of the steam upon it may be balanced. It fits upon a conical valve-seat, and its lower edge is serrated, as shown, so that the higher it is raised the larger is the opening into the steam chest. The valve-stem, *e*, is loosely connected to the short arm of the lever, F (Fig. 1), in such manner that the heavy ball, G, tends to raise the valve from its seat. The top of the valve-stem is fashioned into a cup, which serves as a step for the spindle, *o*, which passes through the standard, H, and is pressed downward by the opening apart of the balls, I I. This spindle is surrounded by a hollow sleeve, upon which is secured the pinion by which the rotation of the balls is effected.

It will be seen that, besides accomplishing in the fullest manner the main purpose of the invention, this governor acts with very little friction, and that it is of the simplest character. By attaching a cord to the long arm of the lever, F, the engine may be stopped very promptly on emergency, without the delay of calling the engineer. The speed of the engine is regulated by adjusting the ball, G, in the proper position upon the lever, F.

The patent for this admirable invention was granted on August 14, 1860; and further information in relation to it may be obtained by addressing the inventor, Robert W. Gardner, at Quincy, Ill.

NATURAL LIFE OF THE HONEY BEE.—The following communication is made to the *Country Gentleman and Cultivator*, by M. M. Baldridge, of Middleport, N. Y.:—The majority of persons who have the care of bees entertain the idea that the worker-bees live many years. Their conclusion is drawn from the fact that colonies sometimes inbabit the same domicile a long period—15 or 20 years—never thinking that, as fast as the bees die off naturally and from other causes, they are continually replaced by a new progeny. The natural life of the honey-bee worker does not exceed six months, and, from recent experiments, I believe, does not exceed, in the summer season, three months. By the aid of the Italian or Ligurian bee, this may be easily and satisfactorily tested. On the 2d of July last, I gave to a very powerful stock of native bees a pure Italian queen. To-day, September 15, this stock was examined to ascertain what proportion of the bees were of the Italian race. Taking out the frames one by one, both sides of the comb were carefully inspected, and, so far as I could ascertain, at leat nine-tenths of the bees were purely Italian. Also, on the 17th of of July, I gave an Italian queen to another stock of native bees. This stock was also examined to-day in the presence of a friend, who assisted me in the examination. Examining the combs, as before, we did not find in this stock *a single native bee!* This change has taken place, as will be observed, in less than two months. Since the 17th July, I have taken out of this colony combs of maturing Italian brood—giving them to other stock—more than enough to make a good colony of bees. Thus, it will be seen that the natural life of the honey-bee, in either of these instances, would scarcely exceed three months; also, that it requires only a few months to change an apiary of native bees to those of the Italian race.