NEW OSCILLATING VALVE.

Our engraving represents a new form of oscillating valve for steam engines, the invention of Mr. Leonard Mangold, of Chattanooga, Tenn. The valve is shown in perspective in Fig. 1, in section in Fig. 2, and a detail of the valve packing is shown in Fig. 3.

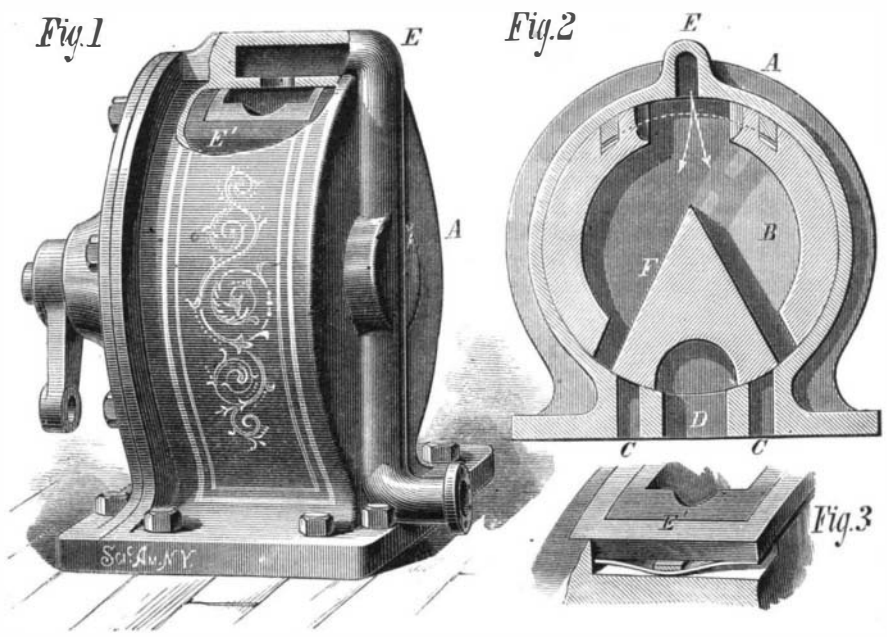
The valve casing, A, which is made in cylindrical form, contains a cylindrical valve, B, and has steam supply ports, C, and an exhaust port, D, between the two ports, C. A steam inlet, E, runs up one end of the case and enters the same at the top. The valve, B, has a steam inlet at the top, and at the bottom it has two outlet ports, one at each side of the triangular partition, F. This partition extends the entire length of the valve and upward above its center, and in its lower side there is a recess which forms a passage for the exhaust steam to the exhaust port, D.

Around the steam inlet port, in the top of the valve, there is a groove of suitable depth to receive a metal frame, E', which is curved to correspond with the curvature of the valve, and is forced outward by means of two springs placed under it in the groove. This frame forms a packing for the valve, and as it surrounds the inlet port it prevents the escape of steam in any direction.

The steam that enters the valve through the inlet port strikes the apex of the triangular partition, and is divided so that it will pass through either of the ports, C, with the same force, when the valve is turned so that one or the other of the ports, C, coincides with one of the outlet ports of the valve casing.

This valve is quite simple in its construction, and is said to be effective and not liable to get out of order.

For further information address the inventor as above.



MANGOLD'S NEW OSCILLATING VALVE.

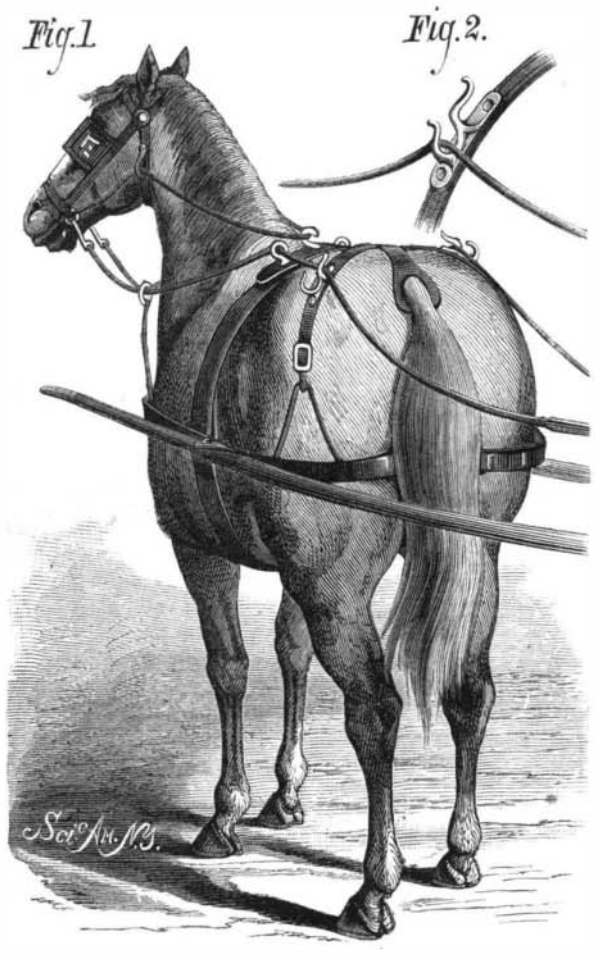
Value of a Waste Product.

For the past ten years the ammoniacal liquor produced at the gas works of Bradford, England, has been sold under contract for $4,000 a year. The holder of this contract lately bid $40,000 a year for a renewal of the contract, but failed, the successful competitor bidding $51,795. The discovery in the liquor of a substance useful in manufacturing aniline dyes was the cause of its enhanced value.

NEW REIN HOLDER.

This useful little device, which is shown so clearly in the engraving as to require little description, is the invention of Messrs. J. M. Taylor and J. Mackay, of Fredericton, N. B.

This rein holder consists of two double hooks, one of



TAYLOR & MACKAY'S REIN HOLDER.

which is attached to each of the hip straps. These hooks are placed about ten inches apart, and are equally distant from the back strap. The upper part of each hook is made quite open, so that the reins will readily drop into them when they are relaxed, and thus prevent them from becoming entangled with other portions of the harness, or getting brushed down by the horse's tail. The opening of the lower hook is smaller than that of the upper hook, so that when the reins are placed in the lower hooks by a dexterous movement of the hand, they will be retained securely. The reins are removed from the lower hooks by drawing them taut and at the same time moving them upward and outward.

This invention was recently patented in the United States and Canada. For further particulars address the inventors as above.

Iridescent Lace Work.

At the June meeting of the Society for Encouraging National Industry, of France, M. Hélouis exhibited samples of metallic threads and ribbons irisated by means of binoxide of lead, and also samples of lace work ornamented with them.

Nobili was the first to obtain such deposits as these on different metals, by electro-chemical means. He immersed a metallic plate, placed in communication with the positive pole of a battery, in a solution of acetate of lead, for example. The negative pole was fastened to a platinum wire, surrounded, except at the ends, by a glass tube; this tube dipping into the liquid in such a way that the free metallic end was placed at a distance of from 1 to 2 millimeters from the plate, the current was passed through it. It was observed that around the wire there were formed concentric rings, produced by delicate films of binoxide of lead, and characterized by varied and extremely brilliant colors, like those exhibited by soap bubbles. Becquerel made an exhaustive study of this phenomenon in 1843. By substituting for acetate of lead a solution of oxide of lead in potassa, or soda, he obtained iridescences that were much more solid, and by taking a certain number of wires as negative poles he was enabled to give objects of small dimensions uniform colorations of such tints as he wished. For certain kinds of objects his process is still in use at the present day.

But "irisation" has never before been attempted on ribbons or wires of such delicacy as to measure on an average 32,800 feet in length to the pound. M. Hélouis has succeeded in giving these delicate threads and bands uniform tints throughout their whole length, and in producing at will any color that he desires. With these irisated wires he ornaments laces, tissues, fringes, etc., which have a very beautiful effect, and the lace making industry is now making extensive use of them.

Pokeweed Paper.

Les Mondes says that Dr. Eugene Robert, of Segaune, France, has suggested that an advantageous utilization might be made of the common poke or pigeon berry (*Phytolacca decandra*) in the manufacture of paper. This common weed grows almost everywhere, is very hardy, and according to Dr. Robert yields an abundance of ligneous fiber extremely suitable for paper making. As the material is one that is so readily procured, it would be well for our manufacturers to try it.

A Tomato Disease.

M. Garcin has called the attention of the French Academy to a disease which has, during this year, attacked the tomatoes in the Maritime Alps. The malady made its appearance in the form of a whitish efflorescence on the surface of the fruit. Suspecting it to be due to the presence of a parasitic fungus, M. Garcin examined some of the matter with a high power of the microscope. It was seen to be composed of a mycelium of white, septate threads, finely granular at certain points; and the terminal joint of each of the ramifications was swollen and filled with spores. Free spores mingled with the mycelium; and the presence of zoospores of still larger dimensions showed the fungus to be in full fruit. M. Garcin believes, therefore, that he is correct in referring the parasite to the genus *botrytis*, several species of which are already well known. He calls attention to the fact that this season, for the first time in many years, the *muscardine* has made its appearance in many silk worm nurseries of the department. Now the *muscardine* is due solely to the development of *botrytis bassiana* in the body of the silk worm. Is there not, he asks, more than a fortuitous coincidence between this appearance of the *muscardine* and the epidemic development of the tomato disease? It is possible, he suggests, that sulphur applied in time, or sulphurous fumigations, would succeed in arresting the disease, since such means have always been successful in analogous cases, as in the oidium of the vine, peach mildew, etc.

THE NEEDHAM MUSICAL CABINET.

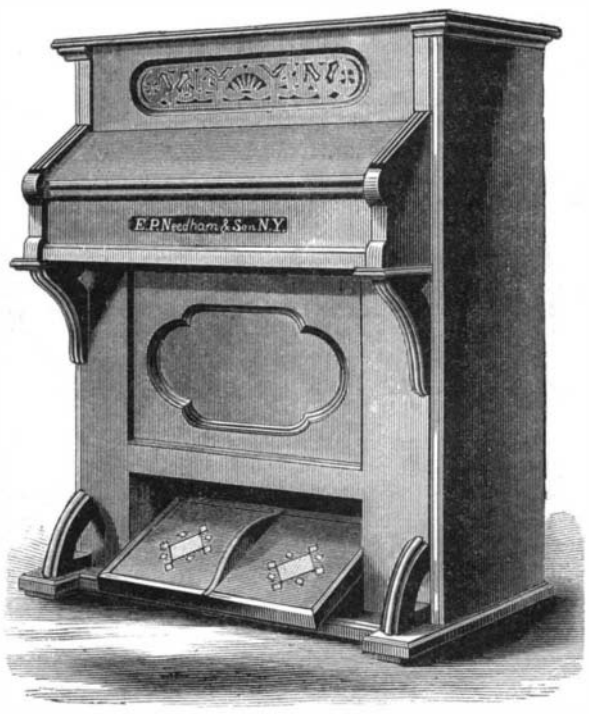
The accompanying engraving represents a musical invention which is perhaps one of the greatest novelties in this age of mechanical surprises. It is nothing less than a parlor organ on which any one can play the most difficult music, no matter whether he has a knowledge of music or not. All that is necessary is to put the music one desires to play inside the organ, and blow the bellows with the feet, when the music will be correctly executed; consequently any one, even a child, who has the ability of working the pedals of a sewing machine can produce all kinds of music as correctly as the most skilled professional performer, and it is done to such a degree of perfection that we may consider this instrument as a musical educator that may teach people in out-of-the-way localities the style in which various kinds of music have to be performed, whether vocal or instrumental, sacred or secular, operatic or classical.

The instrument always plays in correct time, and the most difficult passages are rendered as fluently as the more easy strains. The retardations and accelerations in time intended by the composer, and which are so beautifully observed by superior performers, are perfectly rendered on this instrument, entirely independent of the person working the pedals, who has only to keep in rotation a small fly wheel.

From the above it will be seen that to play this organ the use of the hands is dispensed with, and that the player may not have a musical ear; he may even be absolutely deaf and still execute the music perfectly.

All mechanical organs that have been built heretofore have been very complicated and expensive contrivances, on which only the pieces could be played for which the cylinders were arranged, while the length of the piece was limited. In the Needham musical cabinet, having the special sheets of music, any piece may be performed. And the way in which this is accomplished is beautiful for its simplicity.

The organ has neither keyboard nor valves, but consists of a set of bellows worked by the pedals, a set of reeds, to which the bellows furnish the wind, and a simple arrangement of mechanism which carries the music paper over the reeds. This music paper is the most essential feature of the



THE NEEDHAM MUSICAL CABINET.

instrument, and constitutes the artistic part of the same. The notes are holes punched in the paper, the length of the holes corresponding with the length of the notes, and when holes of the proper length are punched at proper distances, the paper, while passing over the reeds, will shut the wind off from some of the reeds while it permits others to sound. The pedals perform the double duty of blowing the bellows and carrying the music paper over the reeds.

The sheets of music paper, which are very strong, are 18 inches wide, and from 40 to 100 feet in length. Music sheets of this kind do not cost much more than ordinary sheet music, the perforations being made rapidly by means