

no small proportion of the work on small scales, each give employment here to a good many hands, although every facility has been provided to favor the work in these departments. The pieces of scales and weights to be japanned are piled on cars which run on tracks leading into huge ovens, thereby necessitating as little handling as possible. Some of the bronze ornaments are put on with powder, with rubber stamps and size, and others, as well as painted devices of various patterns, are transferred to the various parts by the decalcomanie process.

The tin shop, where also the sheet copper and brass are worked up into the different kinds of scoops and receivers, is provided with all the appurtenances which the inventions of the past few years have brought so prominently forward in this business. In this department 300 boxes of tin plate and 10 tons of sheet brass and copper are used annually.

The carpenter and joiner shop forms a large and important branch of the business; for here are made not only the wood-work of the scales, but the packing boxes in which they are shipped. Only the best seasoned wood is used in the scales, and to obtain a proper choice for this purpose from one to two million feet are always kept on hand. The company own large tracts of timber land convenient to their factory, and receive from their own sawmill over a million feet annually. Their platform scales with hard wood platforms have been decidedly preferred to other patterns with iron platforms, horses not being so likely to slip on them, and when the platform is worn or broken it can be easily repaired.

Of the large number of patents issued to the company for improvements made at their establishment in the scale manufacture over thirty are still in force, although the original invention on which the first Fairbanks patent was granted was made in 1830. Among the most important of their present patents are those on machines for milling knife edges, for weighing and distributing scales, for electro-magnetic weighing machines, automatic grain scales, track scales, registering and recording beams, letter balances, etc. They do not, however, lay so much stress on the value of their patent rights as they do on the perfect work they have always made it the rule of their establishment to turn out, to which end their long experience and ample capital are especially directed. Both at home and in foreign markets they have met with competition from cheap scales, but they hold, as they originally won, their position as the largest manufacturers of scales in the world by steadily adhering to the policy on which the business was commenced, of sending out only the best goods. Their exports include shipments to nearly every country on the globe, the weights and scales being often so provided as to give readings in two or three different languages, many of those now sent abroad being fitted up for weighing according to the French metric scale as well as that called for by the particular usage of the country where they are sent.

It has often been matter of comment that so large a manufacturing business has been thus successfully developed so far inland, away from water communication with other localities; but the explanation is readily found in the fact that the place has grown up with the industry, and now affords the large number of trained mechanics, drilled in this especial branch of business, without which it would be impossible to make it a success. The firm, while adhering strictly to the best business principles, have always been liberal with their workmen, anxious to promote faithful and skilled hands, and pensioning those who have become superannuated, so that, instead of having been troubled with strikes and disputes about wages, its members are regarded by their employes with more of that friendly feeling so often found in France and a few other localities in Europe, but which is seldom seen in so marked a degree here. With the growth of the town, too, have come the most liberal railroad facilities, so that, from tracks which run into the works, supplies may be received and goods shipped direct on trunk lines running to all points of the compass. A large proportion of the employes own their own houses, and different members of the firm have built and endowed various institutions for the benefit of the community in which their business has grown up, among which are a library, art gallery, lecture hall, and an academy.

The New York office of the firm is at No. 311 Broadway, but they have besides this fifteen other warehouses in different parts of the country, and established agencies in every quarter of the globe.

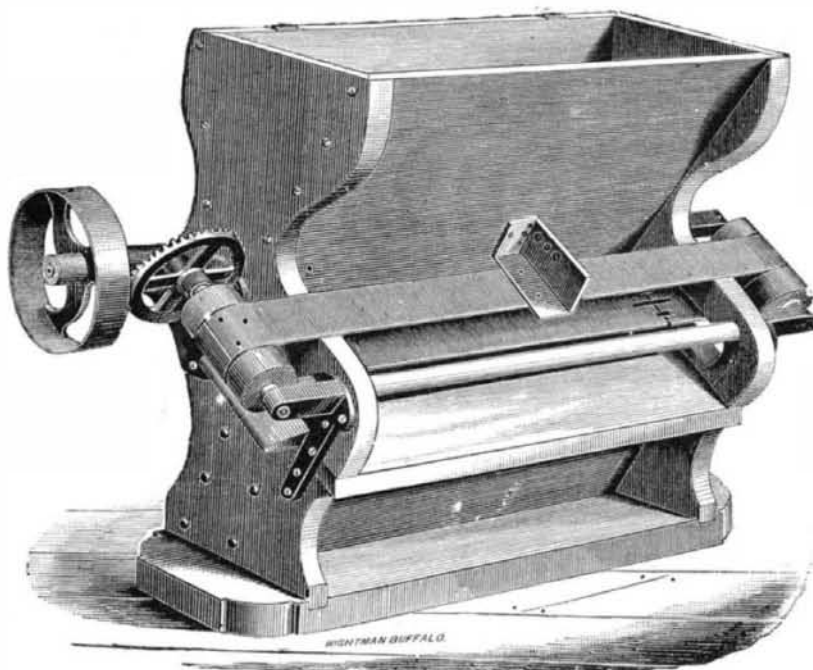
Repelling Flies.

I manage to keep flies out of my stable by removing the droppings se-

veral times a day, and sprinkling very slightly the floor of the stable with kerosene. I have a tin can with a cork in it, through which is pierced a small hole; through this I drop the kerosene. A pint will last over a week, and seems to be quite objectionable to flies of all kinds. — *Wm. Horne, V. S., in Country Gentleman.*

THE MAGNETIC SEPARATOR.

The engraving shows a magnetic separator for automatically removing metallic substances from grain. As the harvesting and thrashing of all kinds of grain are now done almost exclusively by machinery, and since the introduction of wire-binding attachments to the reaper, magnets in some form for removing pieces of wire and other metallic substances from the thrashed grain have become an absolute necessity. Heretofore gang magnets, placed in spouts through which the grain flows, have been used. With this method, however, after a certain amount of metal has been

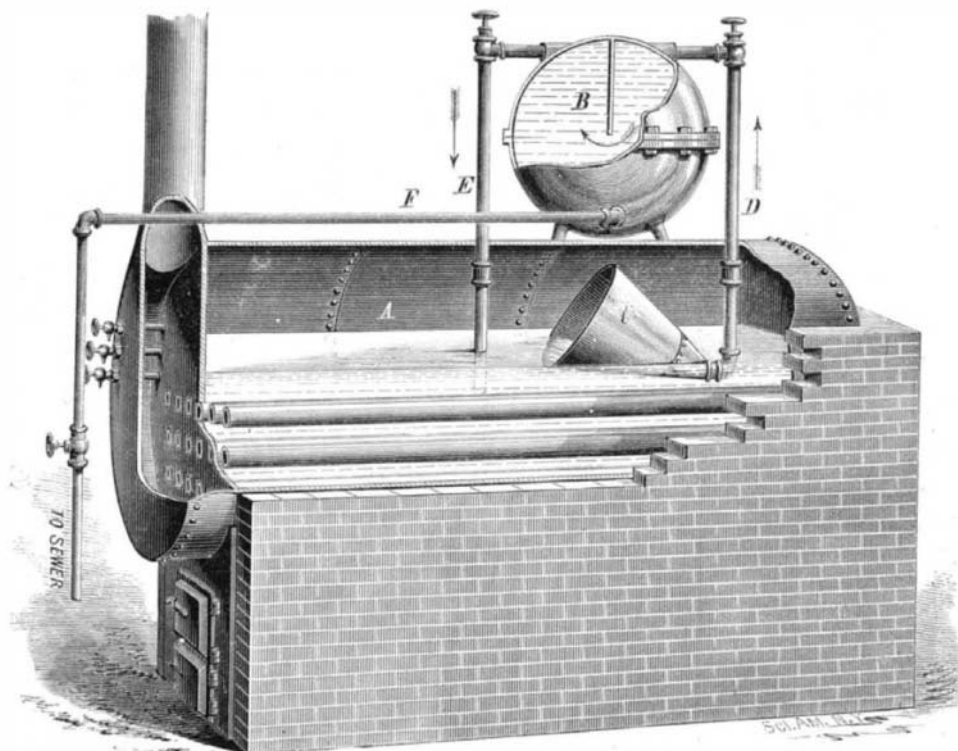


MAGNETIC SEPARATOR.

collected by the magnets, it is necessary to remove them and brush it off by hand, and unless the flow of wheat is stopped the material to be taken out passes on with the grain. If the magnets are left too long in the spouts without being cleaned, the metallic material is carried by with the grain, and the consequence is that more or less of the material sought to be removed is left in the grain.

The engraving shows a machine which does this work effectually as well as automatically. The grain is fed into the hopper, from which it passes over a zinc plate the entire width of the machine. As this zinc plate is placed on poles of magnets, any metallic substance in passing with the grain over the magnets is held by the attractive force of the magnets until removed by the wiper, which, being attached to an endless belt, passes once a minute over the magnetic field, carrying off the metallic substances, depositing them in a box at the side of the machine. This process relieves the miller from care, and prevents metallic substances from going with the grain to the burrs or rolls as the case may be, unless introduced after it has passed the machine. To prevent this, the separator should be placed as near the burrs or rolls as circumstances will admit.

For further information address Messrs. Howes, Babcock & Ewell, manufacturers, Silver Creek, Chautauque Co., N. Y.



THE HOTCHKISS BOILER CLEANER

A NEW BOILER CLEANER.

The device represented in the accompanying engraving is designed to prevent the incrustation of steam boilers by removing all the scale-forming matter contained by the water used in them, whether vegetable or other matter in suspension, or salts in solution. The simplicity of the principles upon which the action of this ingenious invention depends, and their entire accord with natural laws, commands the approval of all practical engineers. The problem of preventing incrustation in steam boilers has proved to be one of the most difficult ones in the whole range of engineering science.

Millions of tons of coal have been wasted, vast amounts of property destroyed, and thousands of valuable lives sacrificed to the evil which this device, it is claimed, effectually removes. The most careful consideration has been given to this subject by scientific men, mainly in the direction of chemical analysis. How to render the solid sulphates, carbonates, and chlorides more soluble, and thus enable engineers to relieve their boilers by frequent blowing, has been the inquiry. But the results of these investigations have been only partially successful, and the owners of steam boilers have found only too often that the remedy proved worse than the disease.

Many mechanical devices have also been tried in this and other countries, but these have been crude and complicated, involving much trouble in manipulating them, and were finally discontinued.

The invention which we illustrate seems to mark a new era in the treatment of this subject. Since its first introduction, in 1876, it has been steadily growing into public favor, until it has secured the unqualified approval of many of the most practical and scientific mechanical engineers in this country.

The proprietor, Mr. James F. Hotchkiss, by a series of experiments and improvements, has reduced the question of the removal of sediment from, and the prevention of incrustation in, steam boilers to a certainty, and over six hundred times has this fact been demonstrated by trials in every part of the country and with all kinds of water.

The engraving represents the cleaner as attached to any ordinary boiler. The large iron bell mouth, C, is placed near the tubes or flues so as to bring the bottom of the mouth on a line with the lower gauge cock (low water). This mouth is usually connected by a right and left nipple and elbow to the vertical up-flow pipe, D, piercing the shell as far back as braces will allow, and connecting with one side of the improved reservoir, B, at the top. From the opposite side of the reservoir a return pipe, E, extends to a cooler stratum of water as near the bottom of the boiler as the tubes or flues will allow, the lower the better.

This system of pipes forms a siphon, which, together with the difference in temperature between the surface and the point where the water returns to the boiler, causes a constant circulation of water as long as any steam remains in the boiler. In all boilers heated at one of their extremities there is established a circular motion of the water, which not only raises the solid bodies and agitates them, but also keeps them in constant motion in such a way that the surface currents always set back from the fire, while those at the bottom travel in the opposite direction, so that all matters contained in the water, whether originally held in suspension or precipitated from solution, are carried by ebullition to the surface, and there float until they are finally deposited upon the heating surfaces, and attach themselves in the form of scale, and this continues until the accumulations cause a great

increase in the amount of fuel required for evaporation and incur the danger of explosion from overheated plates.

The Hotchkiss mechanical boiler cleaner affords a complete remedy for these evils by removing all sediment as soon as it rises to the surface. As the suspended matters are thrown upward by ebullition the surface current carries them toward and into the large mouth-piece, whence they are carried by the circulation to the reservoir, where, the water being cooler and in a quiescent state, all solids are precipitated. The solid matter may be blown out from time to time through a blow-off pipe, F, provided for that purpose. The spherical form of the reservoir permits of blowing out the mud which accumulates in it, without wasting the water.

Although the general principle of this invention has not been changed, it has been greatly improved in detail, and cheapened and simplified, so that it may be readily applied to any boiler by an engineer or ordinary mechanic.

Further information in regard to this invention may be obtained by addressing Mr. James F. Hotchkiss, 84 John street, New York city.