

Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

VOL. IX.—NO. 11.
(NEW SERIES.)

NEW YORK, SEPTEMBER 12, 1863.

{ SINGLE COPIES SIX CENTS.
{ \$3 PER ANNUM—IN ADVANCE

The Hawk-eye double Zig-zag Oat and Grain Separator.

Few persons are aware of the amount of dirt and rubbish contained in a single cargo of grain. A visit to some of the elevators, which operate in the various grain ports of the country, would enable individuals to obtain some information on this head; and they could also see the huge pile of sticks, newspapers, dust, chaff, and refuse of all kinds, that becomes mixed up with a cargo of wheat or oats in course of transportation. These foreign substances materially injure the grain, and make it musty and unsaleable. Even after the wheat has passed through the elevator, a large percentage of dust still remains, which it is desirable to remove more perfectly before grinding. The subjoined engraving represents a new oat extractor and grain separator, recently introduced by Mr. J. Fergusson, of Dubuque, Iowa. The inventor calls it the "Hawk-eye double zig-zag oat extractor and grain separator," a sufficiently sonorous title; and he claims that it will do its work most effectually; in proof of which statement he has a number of letters from parties using them. The construction and operation of this machine will be readily understood by referring to the following description.

The stout wooden frame, A, has a bolster, B, on each end, from which is suspended the riddles, C, by the spring hangers, D. The riddle frames receive a reciprocating motion from the eccentric, E, on the horizontal shaft; this eccentric is driven by the pulley, F (as may be seen), from any motive power convenient. The plate, G, has a slot through it, which allows the eccentric rod connecting to the riddles to move freely, and it also serves to strengthen the end of the riddle frame. On the top of the machine is placed the hopper, H, one side of which is broken out to disclose a row of pins, I, which are stationed in the riddle; on the side of the hopper, which can be taken off when required, there are two hinged plates, J, one on each side, which are easily jointed to the rods on which they hang. At the bottom underneath the frame there is a fan or blower, K, which is driven by the usual method, and has a series of chutes, L, or channels connected with it for a purpose which will be apparent hereafter.

The operation of this machine is as follows. On the grain being placed in the hopper and the ma-

chine started, the riddles receive a reciprocating motion back and forth; by this action the pins, I, stir up the grain and allow it to circulate freely, while the hinged plates, J, prevent it from falling off at the side prematurely. The grain first enters the

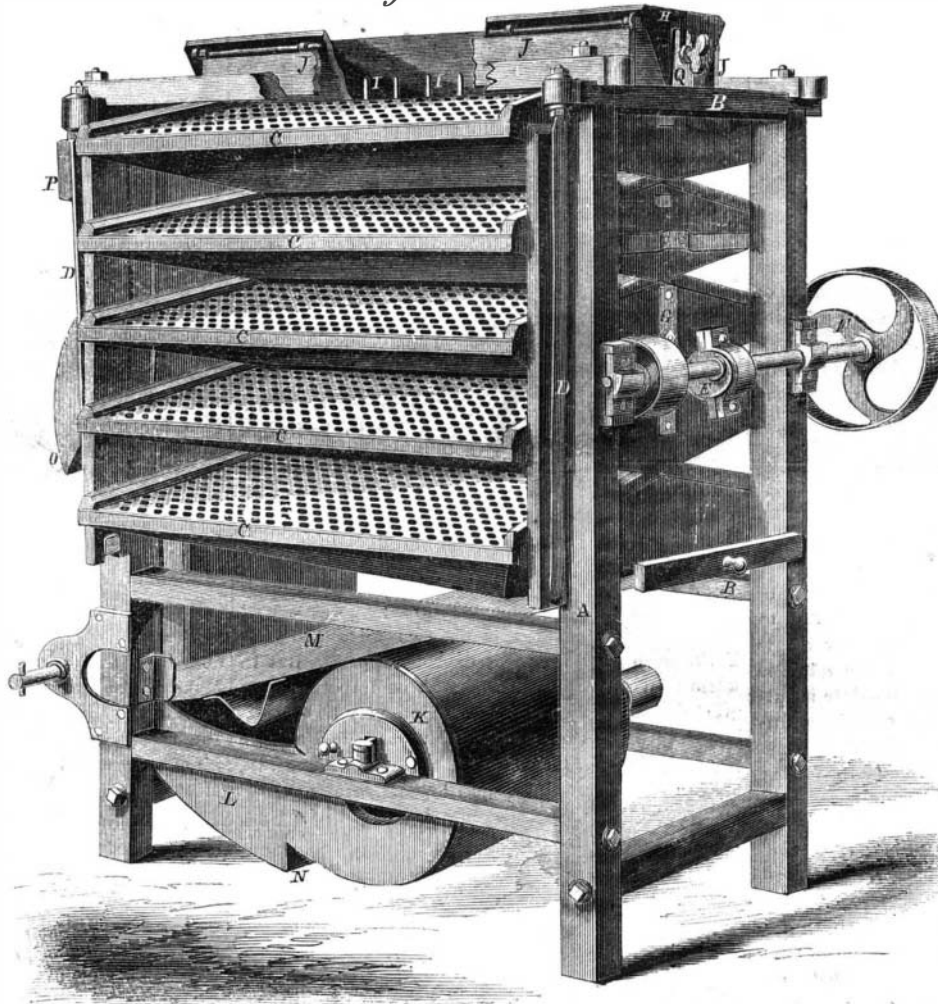
screen, M, which takes out the cockle, sand, grass seed, &c., when the wheat falls into the fan blast, passing down through a strong current of air, and is discharged perfectly clean at the bottom of the machine, at N, while the shrunken and sprouted wheat

and chicken feed are lifted up and discharged at O. The dust, chaff, light smut balls, and all other impurities passing out of the spout, P, which may be conducted entirely out of the mill house, thus delivering the clean wheat, the oats, chicken feed, the cockle, dust, dirt and chaff, each in its appropriate place. The hopper does not vibrate with the riddles, but is attached to the framework of the machine, by regulating screws, Q, that move up and down, so as to regulate the feed at all times uniformly. The screen, M, may be drawn out at any time, by grasping the knob, R, and it is shown partly drawn out in the engraving.

In Fig. 2 is a representation of the method by which the eccentric rod is connected to the riddles, without using a working joint, and obtaining at the same time a free movement of the rod and riddles. The bolt, A, extends clear through the riddle frame, and has the eccentric rod, B, rivetted to it. This rod is a spring from C to C, while the other portion of it is round; this method of construction permits elasticity of movement, while it is unattended with the disadvantages

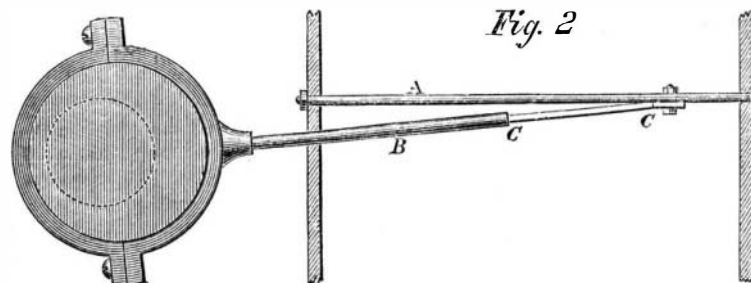
attaching to other modes of operating these devices; a separate patent has been applied for, on this manner of attaching the rod. Two patents have been issued for this machine, bearing date Nov. 5, 1861, and June 30, 1863; further information can be had by addressing J. Fergusson, Dubuque, Iowa.

Fig. 1.



FARGUSSON'S PATENT GRAIN CLEANER.

hopper, H, then falls on to the center of the upper riddle, dividing, so that half passes down on either side; the oats, sticks, weeds, straws, &c., falling off over the outer end of the riddles, whilst the wheat falls through the holes of the perforated zinc riddles, on to a cant board, or sheet-iron bottom, which con-



ducts it back again to the center of the second riddle, where precisely the same operation is repeated again and again, until it passes over all of the riddles; it then falls on to the head of the cockle

ing among the soldiers (Confederate) at from five to fifty dollars a piece, they proved to be a valuable haul. Catfish at fifty secesh dollars apiece are much cheaper than they are delicate.

A FISH STORY.—During an afternoon's bombardment at Port Hudson, a shell which fell into the river exploded under water, and caused such a shock to the fish, that seventy or eighty rose to the surface and floated there, completely stunned. Many of them were of the largest size, and two skiffs quickly put out from the shore and returned loaded with their piscatorial burden. As buffalo and catfish were then selling among the soldiers (Confederate) at from five to fifty dollars a piece, they proved to be a valuable haul. Catfish at fifty secesh dollars apiece are much cheaper than they are delicate.

Labor of Original Thinking.

Sir Benjamin Brodie, in his work on "Mind and Matter," states that a man may be engaged in professional matters for twelve or fourteen hours daily, and suffer no very great inconvenience beyond that which may be traced to bodily fatigue. The greater part of what he has to do (at least it is so after a certain amount of experience) is nearly the same as that which he has done many times before, and becomes almost matter of course. He uses not only his previous knowledge of facts, or his simple experience, but his previous thoughts, and the conclusions at which he had arrived formerly; and it is only at intervals that he is called upon to make any considerable mental exertion. But at every step in the composition of his philosophical works Lord Bacon had to think; and no one can be engaged in that which requires a sustained effort of thought, for more than a very limited portion of the twenty-four hours. Such an amount of that kind of occupation must have been quite sufficient even for so powerful a mind as that of Lord Bacon. Mental relaxation after severe mental exertion is not less agreeable than bodily repose after bodily labor. A few hours of *bona fide* mental labor will exhaust the craving for active employment, and leave the mind in a state in which the subsequent leisure (which is not necessarily mere idleness) will be as agreeable as it would have been irksome and painful otherwise.

Mere attention is an act of volition. Thinking implies more than this, and a still greater and more constant exercise of volition. It is with the mind as it is with the body. When the volition is exercised, there is fatigue; there is none otherwise; and in proportion as the will is more exercised, so is the fatigue greater. The muscle of the heart acts sixty or seventy times in a minute, and the muscles of respiration act eighteen or twenty times in a minute, for seventy or eighty, or in some rare instances even for a hundred successive years; but there is no feeling of fatigue. The same amount of muscular exertion under the influence of volition induces fatigue in a few hours.

The Rhythm of Prose.

In every good prose writer there will be found a certain harmony of sentence, which cannot be displaced without injury to his meaning. His own ear has accustomed itself to regular measurements of time, to which his thoughts learn mechanically to regulate their march. And in prose, as in verse, it is the pause, be it long or short, which the mind is compelled to make, in order to accommodate its utterance to the ear, that serves to the completer formation of the ideas conveyed; for words, like waters, would run off to their own waste, were it not for the checks that compress them. Water-pipes can only convey their stream so long as they resist its pressure, and every skilled workman knows that he cannot expect them to last, unless he smooth, with care, the material with which they are composed. For reasons of its own, prose has, therefore, a rhythm of its own. But by rhythm is not necessarily meant the monotonous rise and fall of balanced periods, nor amplification of needless epithets, in order to close the cadence with a Johnsonian chime. Every style has its appropriate music; but without a music of some kind it is not style—it is scribbling.

Hints on Gathering Fruit.

The following useful hints are from the *Gardener's Weekly Magazine*.—

"Most people are disposed to gather the autumn fruits too soon. They hear the trees creaking in the wind, and they find the ground strewn with wind-falls; from these premises they jump at the conclusion that the fruit ought to be gathered. But a certain percentage of a crop may fall, from various causes, before the crop is ripe. The diseased portion will lose its hold, or the wind may dislodge what is sound, long before the portion which remains firm is fit to gather. A rule is generally adopted by gardeners, that if the pips of apples or pears are turning brown, the crop may be taken; but we should rather say that a decidedly dark and settled hue of the seed is a safer criterion. As to the objection that waiting late into the autumn causes a loss of the fruit by falling, it has little weight; because it is by this process that the weaker and less sound fruit is got

rid of, while the best remains. Taking the crop too early will not only injure the good fruit, by causing it to shrivel, but will also render frequent removals necessary, in order to separate from the stock the rotten ones, which would of themselves have fallen from the tree if more time had been given. A most important matter is gathering the fruit without bruising it in the slightest degree. Apples and pears bought in the market are generally much specked, by which their beauty is spoiled; and most of this is occasioned by blows received both in gathering and in rolling the fruit from one basket to another. This can scarcely be avoided when orcharding is carried on largely; but amateur gardeners cannot well give too much attention to gathering their fruit. Any falling should be obviated, and what does fall should be placed separately. A coat, with deep side pockets, is better than a basket hung to the ladder; and such receptacles, being quite under command, may be made to hold a good deal. The kind of weather during which the gathering is performed is a matter of importance. The trees should be thoroughly dry, and a windy day chosen if possible.

A French Ice Machine.

Small machines have lately been made and sold in Paris, for making ice. A late number of *L'Illustration Universelle* gives an illustrated description of one. A cylinder of sheet tin, with a movable cover at one end, to be kept tightly in its place by a screw when shut, with two openings, one at each end, to receive through two funnels the materials used, and a discharge cock at one end to discharge the contents when the cylinder is to be emptied, are all the apparatus required. This cylinder, when properly charged, is placed on a pair of rockers, to convert five hundred French grammes of water into ice (each gramme being nearly seventeen grains avoirdupois) it is necessary to place in this cylinder or well, twelve hundred grammes of sulphate of soda and eight hundred grammes of hydrochloride or muriatic acid. Into this preparation or bath, says the inventor, place a form or vessel containing the water to be frozen. Close the cover fast, and then for seven or eight minutes give the cylinder a see-saw motion on its cradle, and you obtain the desired result. A solid block of ice of five hundred grammes may be produced by this operation.

It is well known that ice may be thus produced, by the use of refrigerating mixtures; but at a cost apparently greater than is charged for ice in New York, even at its present exorbitant price. But in warm climates, where ice has to be imported from great distances, a good ice machine may be of great importance. A French ice machine was illustrated on page 256, Vol. V., (new series), *SCIENTIFIC AMERICAN*, and an English one on page 72, same volume. This latter machine is the most complete for the purpose, although expensive, that has yet been devised. It was invented in Geelong, Victoria, and large blocks of ice have been made by it.

Home-brewed Ale.

G. Burton, in the *Rural New Yorker*, gives his method of making home-brewed ale, as follows:—"The art of brewing is very easy to be understood, for it is exactly similar to the process of making tea. Put a handful of malt into a tea-pot; then fill it with water—the first time rather under boiling heat. After it has stood some time, pour off the liquor just as you would tea, and fill up the pot again with boiling water. In a similar manner pour that off, and so go on filling up and pouring off till the malt in the pot is tasteless, which will be the case when all its virtue is extracted. The liquor or malt tea must then be boiled with a few hops in it, and when it becomes cool enough—that is, about blood heat—add a little yeast to ferment it, and the thing is done. This is the whole art and process of brewing; and to brew a large quantity requires just the same mode of proceeding as it would to make a tea breakfast for a regiment of soldiers. A peck of malt and four ounces of hops will produce ten quarts of ale, and of better quality than can usually be purchased."

The Merrimac and Massachusetts corporations at Lowell, have each been erecting large buildings, the former one 286 by 72 feet, two stories high, and the latter one 100 by 60 feet and six stories high. The two corporations are at present highly prosperous.

MISCELLANEOUS SUMMARY.

A TELEGRAPHIC CIRCLE ROUND THE WORLD.—A Saint Petersburg journal mentions that an American, named Perry Collins, has presented to the authorities a petition for the construction of a telegraph from Nicolaevsky, on the Amoor, to San Francisco. It will cross Behring's Straits, and pass through Sitka, in Russian America. Since then, we learn the petition has been granted, and we may hope soon to hear of the union of two continents, otherwise than by a sub-Atlantic cable.

Mr. Collins is one of those rare and restless North Americans, who cannot die till he has done something for the glory of his native land. We first heard of him in the State of Mississippi; then in California; again as American consular agent at Petropaulovsky, on the Amoor, and last, we see his name blended with those of Kirk, Winans and Harrison—Americans who have done much for Russia.

A BARBAROUS ENGLISH BULLET.—In the skirmishing which preceded the evacuation of Jackson, Miss., the rebels used an explosive musket ball of the most destructive and barbarous character. These balls are of the Minie pattern, 69 calibre, hollow, and filled with fulminating powder, covered at the base with a cap. On striking any object they explode with terrible effect. One of these terrible missiles struck one of our men in the leg, shattering the bone into nineteen pieces. The effect of the wound of a simple Minie ball is always considered of a dangerous character, but the new ball above described is positively barbarous. They are of English fabrication, and have been recently introduced into Johnson's army.

SORGHUM SUGAR CULTURE.—A very large amount of sugar cane—Chinese, Iniphee and Otaheltan—has been planted in Illinois this year. In a few districts along the Central Railway there are not less than twenty-three hundred acres occupied with sugar cane. The drought, however, has injured the crop, which will only be a medium one. As regards the preparation for making sugar, the *Chicago Tribune* says: "O. M. Brainard & Co. are putting up mills and evaporators at Pera, Onarga, Clifton, Kankakee and Bourbonnais Grove, with a combined capacity of expressing and boiling about 72,000 gallons of juice per day, and they will all be ready for service by the 1st of September."

REMEDY FOR THE BITE OF POISONOUS FLIES.—The venom of fly bites proceeds from the virus the flies absorb in feeding upon putrescent animal matter. Make a poultice of bread, softened with a strong decoction of mallows, and when it is ready to put upon the bite, pour on it two teaspoonfuls of the *oxychloride of sodium*, and apply immediately. The cure is effectual.

It is a noticeable fact that there is not a single copper-smelting establishment in New York. In Boston, there are a few works, which were erected for the smelting of the Lake Superior ore, and have monopolized this business, which has proved one of profit. The works are expensive, but the percentage, where sufficient ore is had to keep engaged, is very great.

AEROPATHY.—We all know about allopathy, homeopathy, hydropathy, and other *pathies*; but *air-cure* is a new *pathy*, lately promulgated by Dr. Jourdanet, who discovered it in the mountains of Mexico. The air-cure may be good; the water-cure is better; but we think the hard-work cure the best of the *pathies* or therapeutic agents.

A desperate effort was made a few days ago, by the rebels at Key West, to blow up the U. S. Sloop-of-war *Dale*, by drifting an infernal machine under the bows of the vessel. The machine was secured, but not till three men belonging to the *Dale* were killed and two wounded.

DURING the bombardment of Port Hudson, three Confederate soldiers were killed by a shell from the mortar boats. These men were buried, and a few days afterward another shell from the mortar boats penetrated their graves and exploded among their coffins. They literally found no rest, not even in the grave.

A CORRESPONDENT wishes to know how long it takes to bore a 24-pounder howitzer, leaving a standing core. Can any of our readers inform him.