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Improved Brick Machine.

The engraving herewith presented is a perspective view of an improved brick machine, which, with two horses, three men, and a boy, makes 18,000 bricks per day, five at a time, and ten every revolution. With the power of a single horse it makes 20 feet of perfect drain tile per minute.

The vessel, A, in the engraving contains a vertical shaft, which has a series of horizontal radial arms, which, by the revolution of the shaft, thoroughly mix and knead the clay. To the lower end of the vertical shaft is attached a scraper, which delivers, through an opening in the side of the vessel, A, at its bottom, the clay, to another scraper operating under the platform, B, which deposits the material on an endless apron passing over the roller, C. By this apron the clay is brought to the molds, D, in front of the machine, which are raised and lowered by cam-shaped openings in the disk, E, rotated by means of the shaft, F, gearing into the vertical shaft. The lower edges of the divisions forming the molds are sufficiently sharp to divide the clay readily. The followers which traverse between the divisions of the molds are also operated by the disk, E, and press the clay firmly in the molds, when follower and molds together are raised, leaving the brick on the endless apron. A simple device (not represented) delivers the bricks ready for drying.

It is difficult fully to describe the operation of this machine without detailed drawings, but enough can be seen to give practical brickmakers an adequate idea of the improvement. Its rapidity of operation—making two sets of bricks at each revolution of the cam disk—its portability, the thorough mixing of the clay, and the excellent quality of the product, all seem to recommend this machine as one efficient for the work designed.

Patented through the Scientific American Patent Agency June 5, 1866. Manufactured by Ferrell, Ludlow & Co., Springfield, Ohio, to whom all orders should be addressed.

ON FLYING MACHINES.

Mr. F. H. Wenham lately read a paper before the Aeronautical Society of Great Britain, entitled "Some Observations on Aerial Locomotion, and the Laws by which Heavy Bodies Impelled through the air are sustained," of which the following is an abstract:—

The author commenced by stating that a great amount of power is required to raise a weight perpendicularly in a still atmosphere, on account of the yielding nature of the support. To compensate for this a very large surface would be requisite, and to enable a man to raise his own weight, together with the machine (assumed at 300 lbs.) by his individual strength, about 1,000,000 square feet would be necessary, which of course places the size of the apparatus beyond the range of practicable construction.

As the sustaining surface is diminished, so must the power be increased. If the surface is reduced down to the ratio of one square foot for each pound to be raised (being about the average ratio of weight to wing surfaces in birds) it will require a power of twelve horses to raise a weight of 300 lbs. perpendicularly on still air. In the paper some experiments

passing body of water. If a thin lath of wood is held perpendicularly, and moved rapidly to and fro, with its plane at right angles to the direction of a running stream, a very great increase of resistance will be felt; and if the lath is fixed centrally, with its plane at right angles at the end of a rod, on immersing this in a stream, the resistance measured will be simply that due to the flat superficies of the blade; but if the rod, held in the direction of the stream, is now put into rapid rotation, the resistance will be equal to the area of the entire circle of revolution, and it is found that the more rapid the motion the narrower may be the blade to give the maximum resistance.

The author then relates some experiments tried with screw propellers, applied to a small steamboat, in order to corroborate this theory.

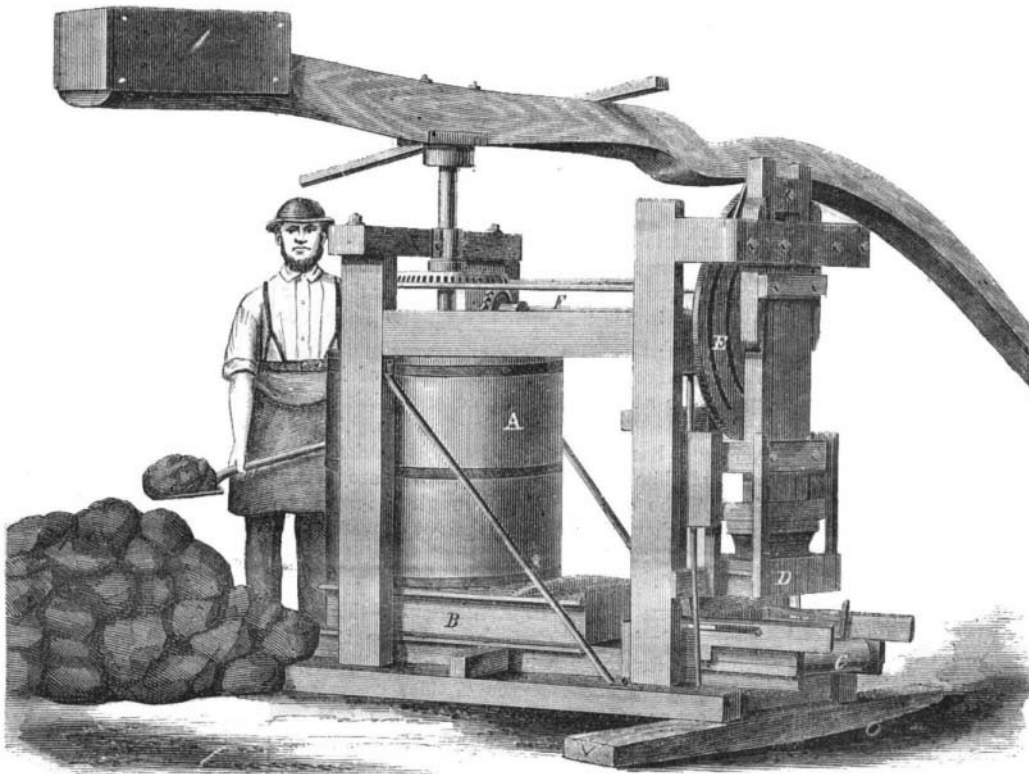
When the boat was moored fast, with the engine running at its utmost speed, but very little tractive effort was indicated, as nearly all the power was consumed in "slip," or in giving motion to a yielding body of water; but the boat was allowed to run on ward, and the screw

are quoted, which show that a force of from three to four horse-power is required for each 100 lbs. raised in the atmosphere by means of a screw or windmill, rotating with its axis set vertically, and the author concludes from these experiments that any machine constructed on this principle, for raising or transporting heavy bodies, must end in failure, as we have no continuous motive power sufficiently light even to support its own weight.

The author next makes some observations on the flight and wings of birds, and points out that endurance of flight and sustaining power, when the bird is traveling rapidly through the atmosphere, is not dependent upon large surface, but on great length of wing, and among other examples mentions the albatross, whose endurance of flight is so great that in stormy weather it never rests on the water. The wings of this bird extend 14 feet from end to end, and only measure 10 inches across the broadest part; the sustaining effect is consequently obtained upon a very wide stratum of air, at a speed of 30 miles per hour. Taking this stratum at one foot thick it will weigh upwards of one hundred times as much as the body of the bird, and as the wings are constantly cutting into a fresh body of air with its inertia undisturbed, it affords a nearly solid support, even when the plane of the wings is set edgewise and parallel to the line of motion. Under these conditions the flight of the bird is performed with a less expenditure of power than by any other mode of animal locomotion taken at a similar speed.

In confirmation of this theory, the author alludes to the lee-boards and sliding-keels of vessels of shallow draught which counteract lee-way and enable the vessel to carry a very heavy press of sail, so great is the resistance they meet against the rapidly

to find an abutment on a fresh body of water having its inertia disturbed; it acted almost as if in a solid nut, the slip being only 11 per cent, and the tractive power at its maximum. The author, after having given many other reasons for showing that the supporting effect of long and narrow planes moved edgewise through elastic and yielding media depends upon the width of stratum, and consequently the weight of material passed over in a given time, proceeds to consider how this principle may be applied to machines for sustaining weights on a support of air. If the proportions of surface and length of wing are taken from examples of the easiest flying birds, in order to sustain the weight of a man and the attachments, the wings must extend out 60 feet from end to end and be near four feet broad. This will at once show that such an arrangement would be utterly impracticable, and that no flying machine can ever be constructed in imitation of the natural wings of a bird. A spar or pinion 30 feet long must be very thick and heavy to bear the total amount of weight to be sustained, its forward edge would also cause great atmospheric resistance, needing more power than could well be spared for flight, and this cumbersome extent of wing would be productive of accident from contrary currents of wind near the earth's surface. The author shows that great length of wing is an absolute condition for performing flight with the least possible amount of mechanical force, and consequently that no machine can be successful if carried out in exact imitation of the wings of flying animals. But from the simple fact that a dozen pelicans, each weighing 21 lbs., may fly exactly one above the other without mutual impediment, as if framed in one, it may be seen that a weight of 250 lbs. may be supported in



WOLLISTON'S BRICK MACHINE.

a transverse distance of only 10 feet, or the extent of the wings of a single bird. On this principle various models were made, all of which, when held in a breeze, gave great supporting power for their size. The sustaining effect was found to be the same whether the planes were extended in one length, or superposed. A model was then constructed of sufficient size to raise the weight of a man. The plane surface was 18 inches broad, and consists of webs of thin holland stretched in a frame. The length of fabric was 90 feet, but, instead of extending in one length it was cut into five pieces, which were arranged equidistantly, one above the other, in parallel planes; the whole weighed about 45 lbs. This contrivance, when held against a breeze estimated at about twenty miles an hour, easily raised the experimenter, but not being provided with any propelling arrangement it quickly descended again, with no worse accident than the fracture of the apparatus. For the last six years other pursuits have prevented the author from continuing these investigations, and till very recently nothing further has been done. Experiments are now in progress for the purpose of ascertaining the force required to propel a series of superposed aeroplanes through the atmosphere, at speeds exceeding twenty miles per hour. Should this prove to be within the compass of manual power, there is some probability that an active man might be enabled to perform extended flights, as the system of fixed wings or aeroplanes may be very light, and at the same time abundantly strong for sustaining weights. An arrangement of planes, fitted together within the last few days for the purpose of experimenting, weighs about 40 lbs., and will bear a load of 3 cwt. with safety. The planes extend 10 feet from end to end, and there is a series of h'min light, with an interval of 8 inches between them. At a speed of thirty miles per hour, six tuns of air per minute will pass through the apparatus, which will give great supporting power, by running on a stratum of this weight.—*Mechanics' Magazine.*

MISCELLANEOUS SUMMARY.

A scientific way of lighting pipes and cigars has been recently introduced in Paris under the name of *poudre de feu*. It consists of pyrophorous, which is preserved in a small tin case with narrow orifice. When a little of this black powder is poured out on the end of a cigar, or on the tobacco in a pipe stem, and then gently breathed upon, it becomes incandescent, and is in a condition to light said pipe or cigar. What next? Why, there are little tubes sold containing pellets of potassium, and they are recommended to the juvenile Parisians as a means of forming splendid Gregorian fireworks on any convenient piece of water! Could Sir H. Davy see this he would be as much astonished as we should in seeing him.

THE Chicopee Manufacturing Company used during the year just closed, 5,872 bales of cotton, and made 9,007,325 yards of goods. The revenue tax of 6 per cent on sales amounted to \$110,863 36, or 26 per cent of the capital stock. Dividends of 45 per cent have been paid during the year. The company have purchased the water power of the Massachusetts Arms Company, at Chicopee Falls, adding a 15,000 spindle power to that previously owned by them.

CHEAP YELLOW GLASS FOR OPERATING ROOMS.—To some thick spirit varnish add a small quantity of iodine sufficient to render the varnish of the requisite deep color. When a glass is warmed, and a coating of the varnish applied, it will be found to be beautifully transparent. In the case of a globe for a lamp or gas it should be warmed, and a little of the varnish poured in and turned round before a fire till properly covered.

THERE are at present twenty-five grain-elevating warehouses in Buffalo, having a storage capacity of 5,495,000 bushels and a transfer capacity per day, of 2,616,000 bushels. Statistics show that more grain is handled at Buffalo than any other one point, not excepting Chicago.

THE manufacture of paper is about to commence in Oregon city. The machinery is on the ground and buildings are now in progress.

BUTTER MAKING.—A machine for making butter, just announced among the new inventions in the English Patent Office, consists of a movable metal cylinder suspended from a small cast-iron frame. The bottom of the cylinder is a loose piece of galvanized iron, and above this it is perforated by a number of small holes. This cylinder is suspended in a bowl of water, and the cream is placed in the cylinder and pressed by a screw piston, the result of which is that the butter is forced through the holes into the water, in the shape of vermicelli. By this means all the buttermilk is excluded, and the butter is found to be much closer and sweeter than when made by hand.

[It is not very clear how this excludes the buttermilk.—Eds.]

TUNNELING THE MISSISSIPPI.—The project of bridging the "Father of Waters," at St. Louis, has met with such strenuous objections that it has been abandoned, and the railroad companies, whose roads center there, have conceived the idea of tunneling the river. Consent to construct the work will be asked of Congress, and as soon as it is obtained, it is proposed to begin the work. The cost is estimated at \$3,000,000, and the time required for the completion of the work three years. The tunnel will not be more than three-fourths of a mile long.

In 1860, there was not a furnace or rolling-mill nor forge nor foundry in Cleaveland; now there are twenty-one, having an aggregate capital of \$3,000,000, an aggregate capacity of 60,000 tuns per year, giving employment to 3,000 men, whose total wages last year, were \$1,080,000. There are in process of erection other iron and steel works which will increase the product nearly one quarter for the year 1866. The iron is all obtained from the Lake Superior mines.

AN exchange says that when a piece of iron is thrown into a trough where chickens drink water they are not affected with chicken cholera. A gentleman who has tried it, says that his chickens are thriving, while those of his neighbors are dying daily. As the chicken cholera is raging to some extent throughout the country, it might be well to try it. Iron will not hurt fowls, and a trial of it might be beneficial.

TO RENDER WOOD UNINFLAMMABLE.—Make a saturated solution of potash, and thicken it with paste as for distemper painting, then add sufficient clay to give it the consistence of thick cream, adding yellow or red ocher or other mineral coloring matter, if desired, for the sake of appearance. Wood painted with this composition is said to be proof against rain, and to be incapable of being inflamed, although it may be carbonized by a fierce heat.

THE Government authorities at Cologne have issued a circular cautioning the public against variegated slate pencils. Schweinfurt green, which contains arsenic, is used for the green, chromate of lead for the yellow, and red lead for the red varieties. The circular points out the danger of this practice, especially to children, by whom slate pencils are chiefly used.

DURING five years ending with 1861, the carrying trade of New York amounted to \$1,644,000,000, over 1,000,000,000 of which was done under the American flag. In the four years which followed, out of the 1,700,000,000 of foreign trade of the city of New York, 1,300,000,000 was carried under foreign flags.

THERE are in the United States about nine hundred railroad corporations that operate steam-power roads; the joint length of the steam-power roads in the United States is about 32,000 miles, and their joint cost is about \$1,280,000,000—equal to an average of \$40,000 for each mile.

ENGLISH locomotive builders have adopted a method long in use on marine engines for fitting up certain connections. On the parallel rods of locomotives they use a solid bush instead of the usual box, and gib, and key. When the bushes are worn out others are supplied. This plan has been introduced on the New Jersey Railroad, and makes a very neat-looking piece of work.

THE burnt district in Portland has been accurately surveyed, and found to cover an area of three hundred and twenty-seven acres.

It is said that Mr. Gale, the discoverer of the process of rendering gunpowder non-explosive, has invented a contrivance for increasing the velocity of discharges from fire-arms. It consists of a longitudinal piece of steel, perforated for bullets, and fitting into a pistol between the stock and the barrel at right angles to the weapon. It is worked by the action of the lock and traverses a certain distance after each discharge. The device is not new. We saw it successfully applied by E. C. C. Kellogg, in Hartford, several years ago, to a rifle barrel mounted on a carriage.

THE sugar house of John B. Brown & Sons, at Portland, consumed in the recent fire, was one of the largest in the United States. The property burned was valued at \$700,000, on which there was insurance for about half the amount. This was one of the few establishments in the country in which refined sugar and sirup are made from molasses. The process is a secret very little known. It has been for many years a flourishing trade in Portland, conducted principally with the island of Cuba, and especially with Cardenas. Nearly four million gallons of molasses were consumed at this sugar house in one year. The works are to be rebuilt.

THE Beet Sugar Manufacturing Company, at Chatsworth, Ill., have six hundred acres of beets growing this year. They estimate the crop at ten tuns to the acre, which would yield full one million pounds of sugar. The machinery of the company is all new, was brought from Germany, and is in the most perfect order. They will commence operations about the first of October. If this enterprise proves a success—of which there is not much doubt—the business will be sure to spread with rapidity through that State and the Northwest.

THE Italian Government has given orders for the manufacture of cuirasses of aluminum for their cavalry regiments. A series of experiments made under various conditions demonstrate that a cuirass of this metal, while possessing the great advantage of being as light as a coat, cannot be pierced by a musket ball at the distance of forty paces, nor by the thrust of a bayonet. The war, however, so far as Victor Emanuel is concerned, having come to a sudden end, we presume he will not spend his money on aluminum cuirasses.

THE Pittsburg *Price Current* has seen a certificate allowing the use of steam of 183 lbs. per square inch, in a boiler that has been proved to the enormous pressure of 270 lbs. The boiler was built to test thoroughly the economy of high-pressure steam, five times expanded. The initial steam in the cylinder is intended to be 165 lbs. per square inch, and 40 indicated horse-power is calculated upon being realized with 60 lbs. of combustible per hour, or 1.5 lbs. per hour per horse-power.

FLY KILLER.—We have tried a great many plans to get rid of flies, but none has proved so effective as the fly paper made by Peck & Nash, of Bridgeport, Conn. A piece of this paper placed in a plate containing water, will invite the flies to a death banquet.

AT Lazell, Perkins & Co.'s works, at Bridgewater, Mass., a mold is being made for casting a monster sea water condenser for one of the Boston and Liverpool packets now being built at Newburyport. It will require twenty tuns of iron, and will be the heaviest single casting ever turned out by these works.

THE bricklayers of Memphis have struck work. They ask an advance of wages which will amount to seven dollars per day. The strike will have the effect of putting a stop, for a time at least, to many of the buildings now in course of erection in that city.

THE Michigan Central Railroad uses, and has fully tested and proved, the superiority of the six-wheel truck instead of four commonly used, and that in all casualties happening upon the road, no passenger inside of a car has been injured.

THE exports from the port of New York, for five months ending May 1, 1865, amounted to \$127,367,973, of which sum \$29,891,174 was in specie and bullion. The imports amounted to \$140,666,379—leaving a balance against us of \$13,298,406. Our tariff is now very high, yet we find a large party clamoring for free trade.