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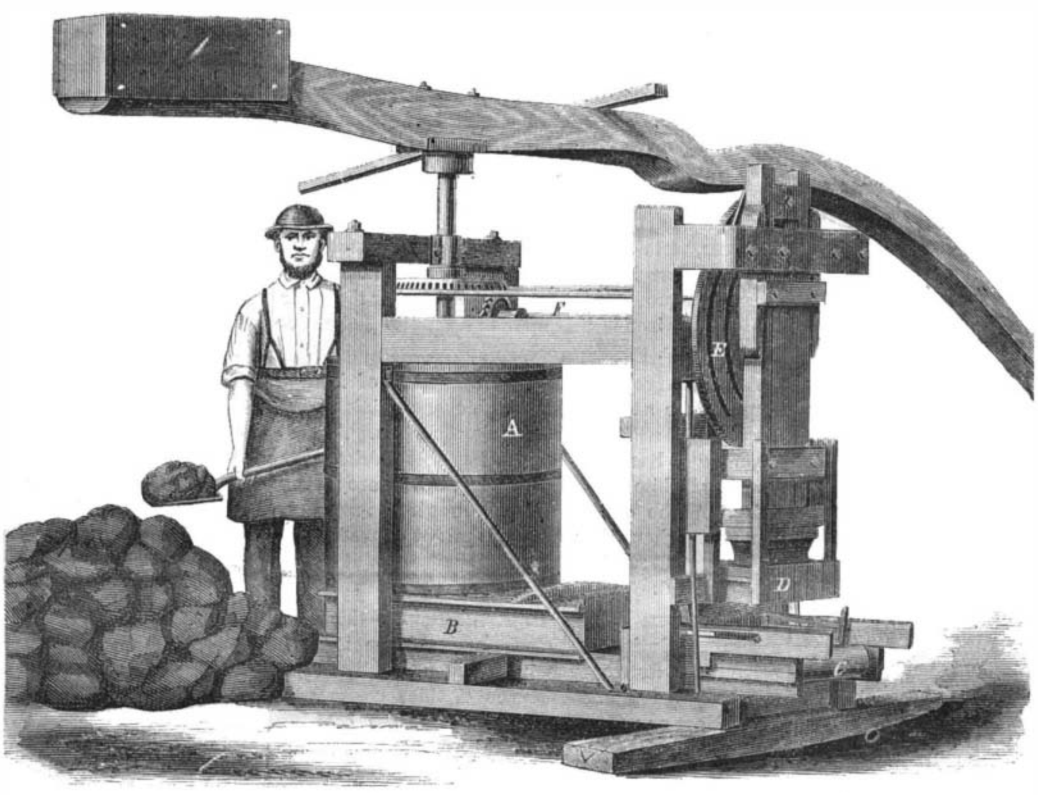
### Improved Brick Machine.

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.



WOLLISTON'S BRICK MACHINE.

### 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 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 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 propelers, 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 onward, and the screw to find an abutment on a fresh body of water having its inertiaun 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 cumbrous 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