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THE IMPERIAL BRICK MACHINE.

The brick machine illustrated in the annexed engraving belongs to that class which comprises all those in which the clay is first mixed in a pugmill and therefrom pressed into moulds disposed on a rotating mould-carrying disk. In this class there are two varieties, first, machines in which the pugmill is vertical and the mould disk horizontal; second, those in which the above relative positions are reversed. A glance at the engraving will show that the present apparatus is of the last mentioned variety. It uses clay taken directly from the natural bed, over which, just before entering the machine, sufficient water is thrown to cause it to be properly tempered while being ground and mixed. Another important feature of the apparatus, as here illustrated, is that it is double—two machines in one—which produce a proportionately greater quantity of bricks.

The clay is thrown into the two hoppers, A, and descends into the horizontal mixing cylinders below. Of these there are two, and through both passes a 6½ inch wrought iron shaft, actuated by the gearing shown at B. In each cylinder and on the shaft are steel cutters, and also screws, the latter adjusted in relatively reverse directions, so that the clay is thus forced out of the outer ends of both cylinders at once; and at the same time the thrust due to the resistance in working the clay is sustained wholly by the shaft, which becomes subjected simply to a compression. This last is an important advantage, as the thrust being removed from bearings or any other neighboring portions, durability is gained, friction diminished, and consequently less power is required to drive the machine.

The tempered clay on being forced outward by the screws enters the moulds, which are formed in the inner faces of the rotating mould carriers, C. As these revolve, a stationary knife at D removes any excess of material. Ten of these moulds are contained in each carrier or wheel, and each mould has a movable bottom with a roller that travels on an eccentric track beneath it. This, as the wheel turns, gives a series of pressures to the brick. An opening is left before the last pressure to allow any surplus clay to escape, so that when the brick comes to the cam that pushes it out upon the endless belt, E, it is perfectly formed.

With the double machine two of these belts are of course employed and a man stationed at each removes the bricks as fast as formed and places them on hacks, planks capable of holding five hundred bricks each. Each belt is about 10 feet in length, and is capable of holding 11 bricks. The capacity of the double machine is claimed to be from fifty to sixty thousand bricks per ten hours—for the single machine, where but one mixing cylinder and mould carrier is employed, half that aggregate. In connection with the above described apparatus, a truck

is employed for transporting the brick to the drying yard. The construction of this is shown at F. It runs on four wheels, and is brought over a loaded hack plank. By means of a crank and simple mechanism the latter with its load is lifted, and suitable tracks being provided, the truck can be moved off by one man to any desired point, where the hack is deposited. He then takes a hack plank of dried brick to the setter (in the same way) under the kiln shed, deposits it, and returns to the machine in plenty of time to get a new load. By this means, we are informed, one man can move 25,000 green brick from the machine to the yard, and take therefrom 25,000 dry brick to the setter in one day. The other hands required are two men to shovel in clay, and two to remove and hack the brick.

Another brick-making improvement, devised by the manufacturers of these machines, is the drying oven shown at G. This is simply a long brick chamber, into which in winter time the hacks of green bricks are placed to be dried. A fire is ignited at one end of the chamber, and the heat passes through and escapes at the chimney at the other end. This admits of the bricks being expeditiously dried, and saves their exposure to the weather. We have seen this machine in operation at the brickyard of the company below named. It produces excellent bricks with remarkable rapidity. Patented January 11, 1876, by Mr. E. R. & W. E. Gard. Other patents now pending. For further particulars address the Imperial Brick Machine Company, Croton Landing, New York.

THE English arctic exploring vessel Pandora is to undertake another expedition next Spring, and an attempt to reach the pole by way of the Spitzbergen, instead of by the Smith's Sound, route will be made.

Properties of the Human Gastric Juice.

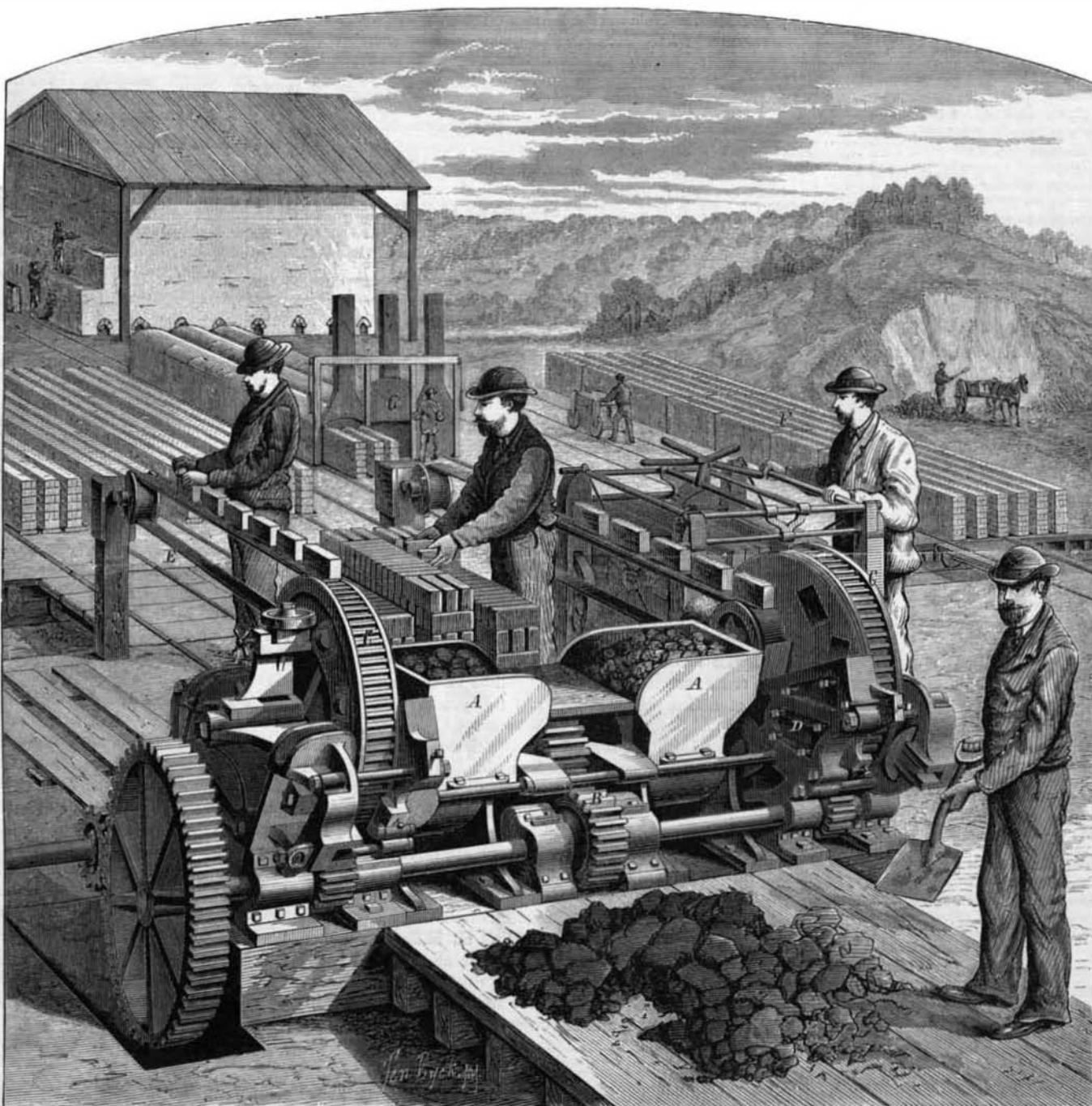
The *Press and Circular* says M. Charles Ricket has been experimenting upon the patient on whom Professor Verneuil recently performed the operation of gastrotomy. According to his researches the acidity of the gastric juice is equivalent to 1.7 grammes of hydrochloric acid to 1,000 grammes of fluid. This acidity increases a little at the end of digestion. Wine and alcohol also increases it, but cane sugar diminishes it. It tends to return to its normal acidity after the introduction of acid or alkaline matters. The mean duration of digestion is from three to four and a half hours, and the food does not pass gradually out of the stomach, but in masses. According to four analyses, after a modification of Schmidt's method, free hydrochloric acid exists in the gastric juice; and altogether this secretion appears to consist of one part of lactic acid to nine parts of hydrochloric acid, the former of which is free in the gastric juice. The nature, therefore, of the free acid in the stomach seems almost solved, and it may be said that in every 1,000 grammes of the juice there are 1.53 grains of hydrochloric acid and 0.43 of lactic acid.

Medical Uses of the Tupelo.

The root of the tupelo tree, indigenous to the United States, is being used with success, so says the *Medical and Surgical Reporter*, by various obstetricians, for dilating the os uteri. It is said to be superior for this purpose to sea-tangle, as its power of absorption is greater; it is as light as a cork, and its fibre is fine-grained, capable of being made very smooth, and therefore easily introduced.

The Compass Plant.

It is well known to botanists that the western plant growing on the open prairies, and known as *Silphium laciniatum*, has the remarkable property of turning many of its leaves nearly north and south, and hence the name "compass plant." It is also called "rosin-weed," from its copious resinous juice. In order to determine to what extent this alleged polarity exists, C. E. Bessey, of Ames, Iowa, has made a large number of accurate observations, which he reports in a late number of the *American Naturalist*. Out of 93 observations, 54 were found which pointed more or less east of north, and 39 more or less west. Of the 54 which pointed eastwardly, 18 were within 5° of north; 8 more within 10°; 7 more within 15°; 5 more within 20°, and 3 more within 25°; leaving only 14 leaves which diverged more than 25° from due north. Of the 39 which pointed to the west of north, 9 were within 5°, 5 more within 10°, 3 more within 15°, 7 more within 25°, and 7 more within 35°; leaving only 8 which diverged more than 35° from due north. Its polarity is fully established.



GARD'S IMPERIAL BRICK MACHINE.