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NEW SERIES.

Hammer for Making Iron Plates.

The annexed engraving illustrates a novel machine for reducing the thickness of iron plates, invented by William Beach, of Philadelphia. It consists of two rollers hung in a revolving frame so that at every revolution of the frame the rollers strike the bar or plate of iron placed on the anvil beneath them; the rollers also rotating upon their own axes, and thus combining both hammering and rolling in the same operation.

The frame, A, which carries the rollers, B B, is hung in strong iron-frame work, and is caused to revolve by a pulley on the end of its shaft. The anvil, C, rests upon one end of the lever, D, and is to be counterpoised by a weight upon the opposite end of the lever. Additional supports for the anvil are also provided in the straps, E E E, and the height of the anvil, or its distance from the rollers, B B, may be varied by altering the length of these straps; thus regulating the thickness of the plate. This is effected by means of screws, F F, at the upper ends of the straps which pass through the axes of the spur wheels, G G; these wheels being connected by an intermediate wheel, and turned by a pinion, H, upon the upper end of a crank rod. An index, I, secured to one of the straps, E, traverses a graduated scale upon the solid framework of the machine, and indicates with minute accuracy the distance at which the rollers pass above the anvil, and consequently, the thickness to which the bar or plate is being reduced.

The inventor says that 1,000 blows may be given per minute, and though the machine was designed especially for rolling armor plates for vessels, it may be used for ordinary shop work.

Further information in relation to this machine may be obtained by addressing the inventor, Wm. Beach, at 1,204 Noble street, Philadelphia.

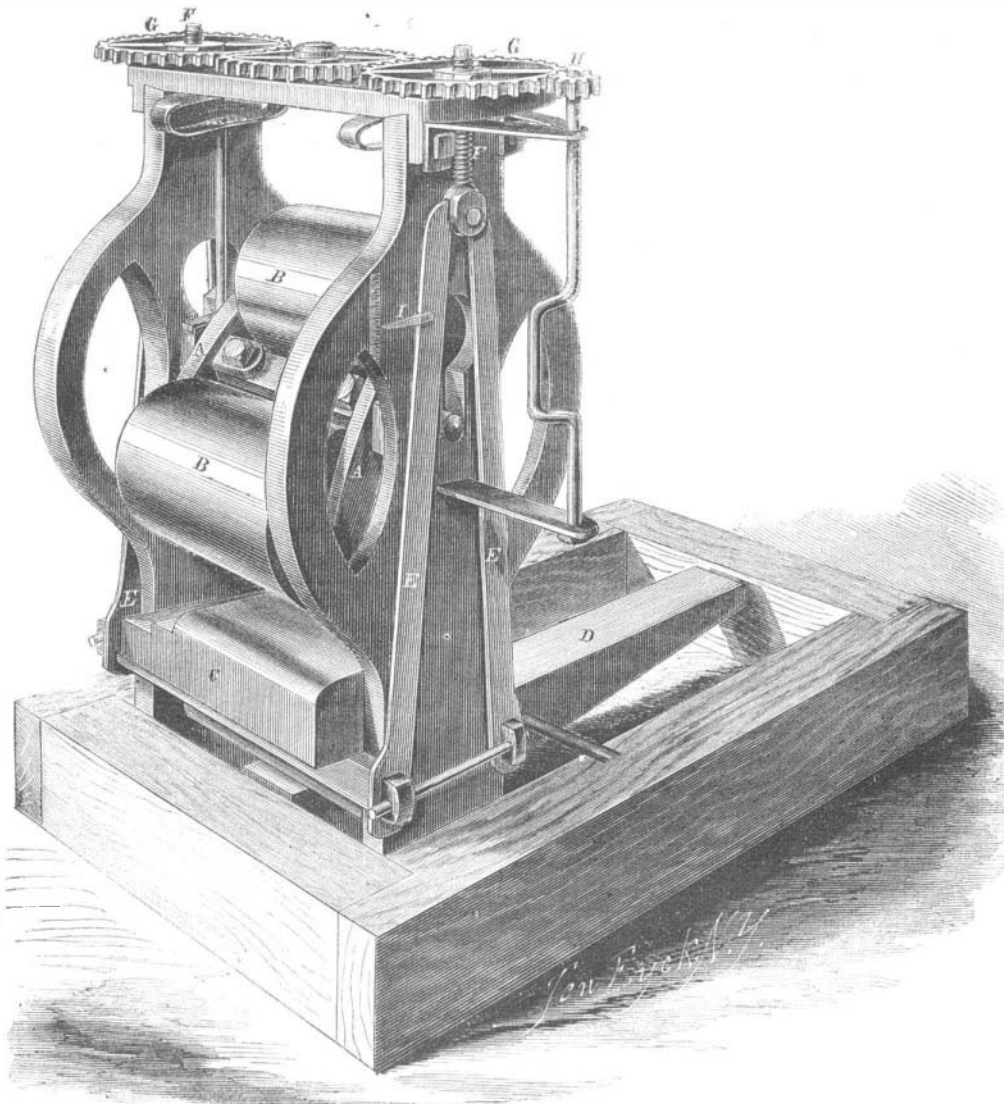
Strength of Franklinite Iron.

From the recent trials made by the admiralty of Great Britain of the best English boiler plate iron from different makers in Staffordshire, Derbyshire and Shropshire, the tensile strength upon a square inch was found to be 19.6 tons, or 44,000 pounds. The English Low Moor bar, as tested at Alger's forge in Boston, gave an ultimate strength of 52,850 pounds. The New Jersey Franklinite bars, tested

at Baltimore, reached over 77,000 pounds. The Director of the National Forges in France, speaking of a bar of American Franklinite, says:—"The aspect of the fracture was all nerves. An immense number of experiments have been made with this press, not only upon all the irons of France, but upon the best irons of England, Sweden, Spain and Siberia. Never has any bar tried reached the abso-

immense masses of mechanism. Their horizontal water guides resemble huge steam boilers. No where else in the world can such great water pumping motors be seen in one place. When in operation they are intended to raise 16,000,000 gallons of water per day, and throw it into the reservoir at an elevation of 115 feet. Each wheel is 9 feet in diameter outside of the buckets, and the height of the fall is 11 feet. Each

will operate two pumps having cylinders 18 inches in diameter with a stroke of 6 feet, and 12 strokes will be made per minute. Wooden cogs are employed in one of the wheels of each turbine in gearing down the speed of the wheel to the pump. Wooden cogs are now very commonly employed in the gearing of steam propeller engines; this has been found advantageous for quiet and smooth running in comparison with the use of entire metal cog gearing. There is a turbine constructed by Mr. Elwood Morris, which has been running at those Water Works for eleven years in conjunction with the series of old breast wheels. It has already done good service, and is apparently capable of doing work for twenty years to come. It is 7 feet in diameter, and throws 121 gallons per stroke. The advantages of turbine over breast wheels in such a situation is, that they can run constantly, whereas the breast wheels are frequently stopped with back water.



BEACH'S HAMMER ROLLER FOR MAKING IRON PLATES.

lute tenacity of the Franklinite. It began to stretch at 15,000 kilograms, and the charge under which it broke was 25,000. Absolute tenacity per millimetre, 40 kilograms 8 m."

PHILADELPHIA WATER WORKS--JONVAL WHEELS.

Great preparations are being made at Fairmount, Philadelphia, to supply the city with water from what has been called the "Extension Water Works." A large new wheel-house is being erected at the upper end of the old one, near the bridge on the Schuylkill river, and three new Jonval turbine wheels, designed and constructed by Mr. Emile Geyelin, have already been put in, but they will not be in operation for a considerable period of time yet, owing to the unfinished condition of the wheel house, &c. These wheels are

to test their sea-worthiness. The *Couronne*, which has arrived from L'Orient at Cherbourg, is selected for the experiments. She is to be sent across the Atlantic. A question which has given rise to a serious controversy among seamen as to the possibility of a completely iron-cased vessel accomplishing the voyage will thus be solved.

To the question "what is the weight of a million dollars in gold?" an officer of the mint answers as follows:—"The weight of one million dollars United States currency in gold is 53,750 Troy ounces. This makes 4,479 lbs. 2 oz.—or nearly two tons and a quarter reckoning 2,000 lbs. to each ton.

THE navy of the Mississippi river will soon number about one hundred war vessels, consisting of gun-boats, mortar boats and rams.