A Great Blast.

A great blast was to have taken place at Mr. P. Callanan's quarries, at South Bethlehem, N. Y., on June 16, but it failed, owing to imperfections in the electric wiring, and was a disappointment to thousands of people who had congregated to witness the explosion, and to many who expected to note some important results from the method employed in charging. The failure was due solely to the inefficiency of the electrician who had charge of the wiring, and the greatest sympathy was felt by all with Mr. Callanan, who had spared no pains nor expense to make the occasion successful and impressive.

The quarries are situated at an angle in the great limestone ridge which passes through this section. Previous excavation has given the quarry a very uniform face, crescent shaped, and about 400 feet long, with a perpendicular height of 100 feet. About 60 feet from the base of the cliff is a ledge or offset, so that the top of the cliff is set back some 20 feet. The blast holes were drilled on the ledge and at the top, being at an average distance of 13 feet back of the face. The holes were drilled to a depth of 26 feet, and were charged with from 30 to 60 pounds each of 75 percent "miner's friend" dynamite. The entire charge amounted to 5,000 pounds of dynamite, divided between 132 holes.

The circuit was connected with a dynamo situated in the crushing mill, close to the quarry. At 4 o'clock, in the presence of Governor Hill and his staff and about 5,000 spectators, Mr. Callanan's pretty daughter turned the switch, without result, as the wires were somewhere grounded. Mr. Callanan, however, succeeded in connecting up three sections of his blast, discharging them separately at intervals of 15 or 20 minutes by a hand battery.

At the second discharge the entire cliff, 300 feet long and 75 feet high, was seen to fall over to an angle of 45 degrees, and then drop, completely crumbled.

The American Petroleum Industry.

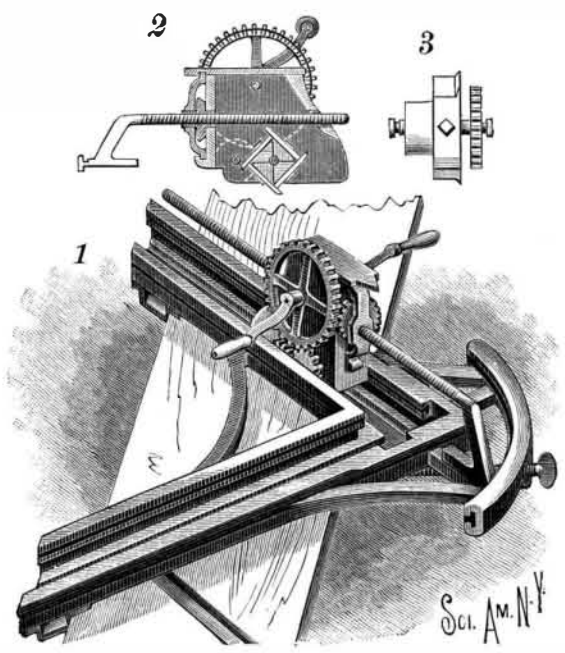
Bulletin No. 76, on the production of petroleum, has been prepared by Mr. Jos. D. Weeks, special agent in charge of statistics relating to petroleum and natural gas, under the supervision of Dr. David T. Day, special agent in charge of the Division of Mines and Mining, of the Census Office. The statistics show that petroleum was produced in eleven States in 1889. The total production is shown to be 34,820,306 barrels, of 42 gallons each, valued at $26,554,052, as follows:

	Barrels.
Pennsylvania and New York	21,486,403
Ohio	12,471,965
West Virginia	358,269
Colorado	316,476
California	147,027
Indiana	32,758
Kentucky	5,400
Illinois	1,460
Kansas	500
Texas	48
	34,820,306

Mr. Robert P. Porter, Superintendent of Census, says that the returns show that of the total product of petroleum, 109,891 barrels were disposed of for lubricating, 12,330,813 for fuel, and 22,379,602 for illuminating purposes. Nearly the entire amount produced in California, Indiana, and Ohio was used for fuel, while nearly the entire amount produced in Colorado, New York, Pennsylvania, and West Virginia was used for illuminating purposes.

AN IMPROVED MORTISING MACHINE.

A portable machine especially adapted for mortising wall strings to receive the risers and treads of steps is shown in the accompanying illustration, and has been patented by Mr. Paul Swieter, of No. 24 Howard Street, Allegheny, Pa. Fig. 1 is a perspective view of the machine, Fig. 2 representing a vertical section through the carriage, while Fig. 3 shows the cutter detached. The base of the machine consists of two parallel angular sections, the members of which are at a right angle to each other, and each of which has a lower horizontal slotted flange, and also an undercut T shaped recess. Opposite the angle of the outside section a segmental plate is secured by radial arms, the plate having a T shaped undercut recess and a downwardly extending central lug through which a set screw passes. The members of the two sections are united by diagonally located connecting plates, by means of adjustable bolts extending up through the slots of the base flanges, whereby the width of space between the sections may be regulated, and in operation the base is attached to the wall string by bringing one side edge of the connecting plates against a face of the string piece and causing the set screw of the segmental plate to engage the other side edge. The carriage is adapted to travel in the space between the sections, and consists of a box-like casing, through which passes the feed screw, having a downward and outward extremity terminating in a horizontal foot, with a button at one end adapted to enter the undercut recess of the segmental plate. At one end of the casing is a vertical bracket, and in the bracket and an aperture in the end of the casing is the hub of a pinion, the bore of the hub being threaded and the pinion turning upon the feed screw. On a shaft near the top of the casing is journaled a crown wheel meshing with the pinion, the shaft being rotated by a crank arm on each side, the crown wheel also, through connecting gears, operating the cutters, which revolve between the sides of the casing in its lower open face. The cutter head is made in two sections, one of which is nominally fixed and the other held to slide, producing a mortise cut of any desired width, or such adjustment may be made that the mortise will be wider at one end than it is at the other. When one mortise groove or channel has been completed, the position of the carriage is reversed, it being then placed

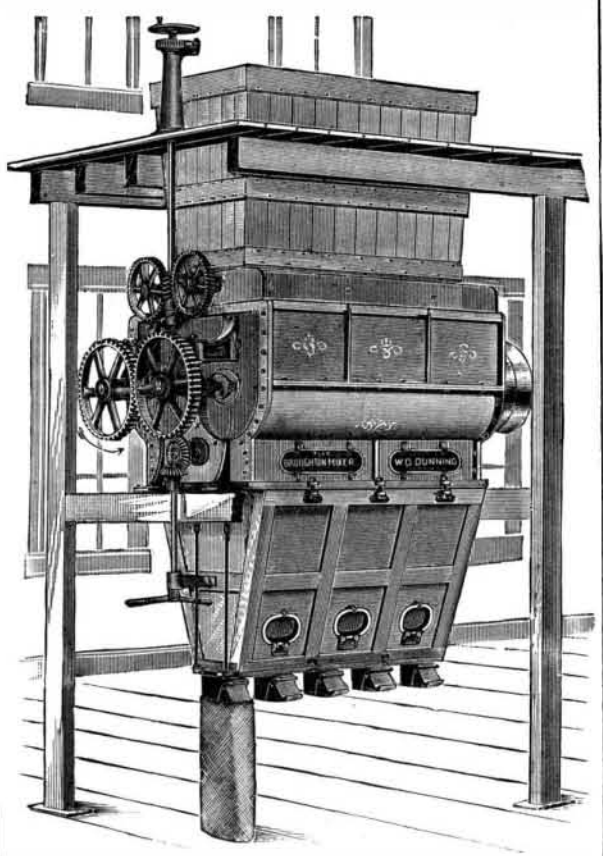


SWIETER'S MORTISING MACHINE.

at the other channel of the base, the foot of the feed screw being correspondingly adjusted in the segmental plate.

IMPROVED MECHANICAL MIXER.

In the preparation of many plastic materials, such as wall plaster, cements, paints and the like, nearly or quite as much depends upon the manner in which the materials are put together and mixed as upon the materials themselves. To secure perfect homogeneity in certain kinds of cements, a peculiar handling which



THE IMPROVED BROUGHTON MIXER.

will insure a thorough mixture of all the ingredients is absolutely necessary.

We give an engraving of a machine which is expressly designed for mixing patent wall plaster, but it is equally adapted for mixing other materials. The casing contains two shafts which rotate in opposite directions, and are provided with spirally arranged paddles which lift the material from the bottom of the casing and throw it in opposite directions from one end of the case to the other, thus insuring a constant motion and obtaining a perfect mixture.

This machine, when set up for use, occupies a position midway between two floors, with the hopper projecting through the floor above, and discharge spouts held at a convenient height for supporting the bags into which the material is discharged from the machine. The hopper is provided with a pair of iron doors which open downward to let the material into the mixing chamber. These doors are attached to shafts which are provided with worm wheels engaged by a worm which is readily operated by a hand wheel on the floor above at the side of the hopper.

After the material is mixed by the spirally arranged paddles, it is dropped into a receiving chamber below by means of sliding doors, which are furnished with shearing edges adapted to cut off anything of a fibrous nature which may be in the plaster, thus insuring a perfect closing of the doors. The receiving chamber is furnished with valves which control the discharge through the spouts to which the bags are attached.

The machine has a capacity of 200 barrels a day of ten hours, requiring only two men to work it, but its capacity can be increased by providing more laborers. No time is lost in operating the machine, for while one charge is being bagged, another is undergoing the operation of mixing, and at the same time the hopper above is being charged, so that really there are three charges in the machine at one time. The machine is arranged to run at a high speed; its shafts are journaled in boxes outside the casing, and stuffing boxes are provided for preventing the escape of the material around the shafts. The high speed and construction of paddles renders it a perfect mixer of hair and fiber with plaster.

This machine is manufactured by Mr. W. D. Dunning, Syracuse, New York.

Extraordinary Increase in the Wheat Trade of Bombay.

The Bombay papers received by the last mail describe the extraordinary export of wheat from that port during the past few weeks. The *Times of India* says that every warehouse near the docks and every available piece of open ground were occupied by towering tiers of bags filled with grain, awaiting the arrival of ships to take it away to other ports, where abnormal prices have been paid for it, and where its arrival is eagerly awaited.

In 1874 the total shipments of wheat from Bombay were 33,071 tons, while in 1886 the figures went up to 617,834 tons, this being the largest total shipped up to the present year. But never since 1874, the year when the wheat trade practically began, have the receipts of wheat in Bombay been so large, or nearly so large, as in the first four months of the current year. They reached during that period the enormous total of 198,097 tons, as compared with 97,420 tons in the corresponding four months of the previous year, and 178,686 tons in the same period of 1886. Steamers representing a total carrying capacity of between 350,000 tons and 400,000 tons were expected to load in Bombay in the course of the present month, and in spite of this large carrying accommodation it will be no easy matter to get the bags, or, at least, those that are not under cover, shipped before the rains. The receipts continue to be so great that as fast as the ground is cleared of one consignment it is occupied by another. The real cause of this unprecedented traffic is the damage sustained by the French wheat crop, which is likely to be about 25 per cent under the average. The traffic over the different railway systems terminating in Bombay has been gigantic during the past few months.

As recently as 1876 wheat was rotting in the Central Provinces, which is now regarded as the granary of India, on account of want of transport, but owing to the railway extensions carried out since that time—the through route to Calcutta being one of the most important—the number of growers has increased materially, and it is now worth their while to produce grain extensively. The lines have been overcrowded with grain, the receipts in Bombay being so vast that the greatest difficulty is experienced in finding warehouse accommodation for the hundreds of tons which are daily brought in from up country. Indeed, the competition for accommodation is so great that the rentals have gone up to more than 100 per cent beyond the ordinary charges. The price of labor and cost of carting have also increased.

Preparation of Lubricants.

The soap formed by treating wool grease with alkaline lye is dissolved in water and filtered. To this a solution of alum or other alumina salt is added, whereby a brown precipitate is formed, which is called "aluminum-lanolate." With this substance, when dried, lubricating oils of any viscosity may be produced by dissolving it in any fluid mineral oil. If dissolved in a small quantity of mineral oil, a gelatinous substance is obtained which may with advantage be mixed with India rubber or gutta-percha. Solvents for India rubber are said to be also solvents for "aluminum-lanolate." In textile industries this substance may also be used as a scouring agent.—*R. Krause, Wittenberg, Prussia.*