

### CONCRETE BLOCK MACHINES.

The marvelous advance in the manufacture and use of concrete, reinforced and in block form, for residential and business construction has opened a new era to the present-day builder. It has made possible an absolutely fireproof skyscraper and a non-inflammable cottage. It has eliminated the constantly recurring expense incident to painting, shrinking, and cracking of house walls. It has made coal bills less in winter and assured coolness in summer. It has reduced the cost of fire insurance. It has made possible a structure which is a guarantee of its own durability, as concrete improves with age. Rain, frost, and heat and the violent changes of weather, which cause wood to warp and rot and brick to crumble, have no effect on the structure built of concrete. With all these advantages, concrete has the merit of cheapness; and so great has been the demand for its use, that more than a thousand firms and individuals are engaged in its manufacture, and more than three hundred makes of machine turning out concrete blocks are on the market.

These machines cover a wide and increasing field. Nor is their use confined to the production of blocks alone. They are employed to turn out shingles, posts, pillars, cornices, and ornamental designs, often of intricate pattern. They vary in capacity from one hundred to two hundred blocks a day with the hand machines to six hundred blocks a day for the power machine working under one hundred tons pressure. In general they may be divided into two classes—the side-face and face-down. It may be put down as a guiding fact for the reader, that any machine with a vertical core is of necessity a side-face, and any machine using a horizontal core, a down-face machine. As we have already stated, the side-face and down-face represent the basic difference between the two types. In various machines of each type the sides of the mold are dropped down by hand or mechanism, leaving

style of machine can justly claim the credit of being the first of any kind put on the market, the H. S. Palmer, the N. F. Palmer, and the Normandin being the initial makes which really turned out blocks actually used in putting up buildings. During the past few years there



Fig. 1.—Carrying Away a Finished Hayden Block.

have sprung up so many variations of the side-face and down-face machines, that to describe even a small number of them would necessitate a volume. This article aims only to give a general idea of the types as represented by the various makes.

The early forms of block-making machines did not turn out blocks which could be used to build residences. They did make a product available for the erection of small structures, such as poultry houses and farm outbuildings. The simplest form of machine was extremely elementary, consisting of two plain-face sides, two plain ends, a rock-face side and end, a core, and two tampers. This was nothing more than a mold-box, and its crudity gives a fair idea of its limitations. With it two men could turn out one hundred blocks, 8 by 9 by 16 inches, a day, tamping being done on top and the core taken out by hand. Equally simple in construction was the Pettyjohn machine, in which the mechanism was lifted bodily, leaving the block on the pallet. This necessitated the removal of the mechanism from place to place. Still the machine was extensively used at one time throughout the West. Both these mold-boxes were built on the side-face principle.

Having attained some proficiency in turning out the small blocks, manufacturers set to work to evolve a mechanism by which rapidity of output could be combined with durability and change of size of product. The use of the wooden pallet over the iron was an early step to obtain speed, and was first employed by E. W. Seamans, who introduced the small hand machine embodying the wooden pallet. It is true that the blocks lost in form and beauty somewhat, but the gain in time did much to popularize the innovation. A further step in the rapidity of output was obtained by the Dayton machine seen in Fig. 7, capable, with two men tamping, of turning out one hundred and fifty 24 by 9 by 8-inch blocks a day. Here the block lay originally rock face down, and was tamped in that position. By using a spring canter it was then thrown into the position seen in the picture, the pallet board being held in place until the product was ready for delivery. Equaling this machine in simplicity of construction are the Cox fence-post and cement-brick machines. The former is shown in Fig. 8. Two men

working on it can turn out from 75 to 100 posts a day, and one man can produce from 1,000 to 1,500 bricks on the latter. The compact form of the completed post is shown in Fig. 8 by the side of the mechanism. The mixture is tamped in the usual way, and the machine then removed by pressing the levers on the end. This does away with the necessity of handling the product, which can remain where it is until dry. Likewise simple and efficient is a machine for turning out concrete shingles. An output of from 10 to 12 squares is obtainable on the power, and about two squares per day on the hand machine, at a cost of \$2.55 per square. The product is the best yet found, is lighter than clay or terra cotta, can be made in any color or design, and adapted to any style of roof.

The variety of uses to which concrete product made into building shapes is being put shows the possibilities of the block machine. House builders throughout the country seeking artistic, durable, and economically constructed homes, are turning more and more to the concrete cottage as affording the only combination of all these qualities, and here it will not be amiss to show how much can be done at moderate cost in this direction. In Fig. 6 a house put up at Columbus, Ohio, of blocks made on the Hayden automatic machine is a good illustration of high-grade results obtainable at small cost. In this case the expense of putting up the building, which is finished throughout in hardwood and polished pine, reached \$4,000, inclusive of the cement walks. It will be evident to the most cursory observer that a cottage like this affords an investment of a permanent character. Figuring five per cent on the cost of the building as a yearly sum necessary for repairs on a wooden structure and unnecessary here, it will be seen that in twenty years the owner will have saved more than the whole cost of his dwelling.

To go back to the machines which make such re-



Fig. 2.—Tamping Concrete in Hayden Machine.

sults possible. The Ideal, a face-down type, seen in Fig. 10, brings into play the use of a lever by means of which the horizontal cores are withdrawn. As shown in the cut, the block is raised on a cast-iron pallet. The face was formerly on the bottom, and is now seen on the side against the faceplate in the rear. To prevent injury to the block in carting away, the makers have provided a carrier which protects it on three sides. This machine is easily portable, and makes any width of block from 8 to 12 inches in lengths of 4, 8, 12, 16, 18, and 24 inches, and can be

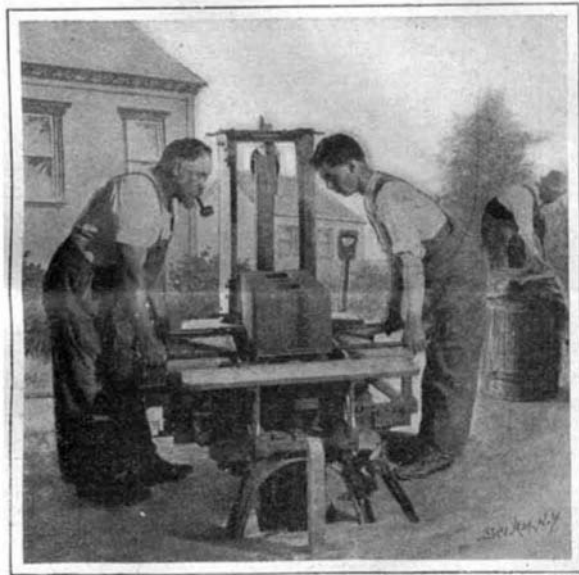


Fig. 3.—Lifting Out the Block.

the product on the bedplate; and in others the product is raised to permit its easy carting away. Each type has its supporters. The side-face machine makers contend that only by their process is a perfect block obtainable, free from settling, and ready to lay in the wall as made. The down-face makers point out that only on their principle is a veneered face possible without leaving a line of cleavage. They also contend that only on a down-face machine can an accurate reproduction of a face design be made. Decision as to the merits of the two processes must be left to the reader. The former

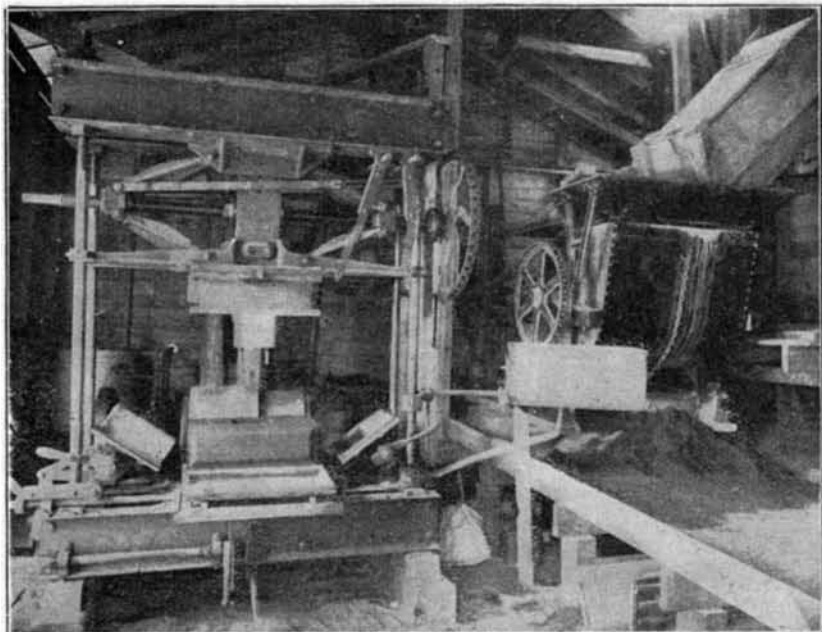


Fig. 4.—Power Machine. Corner Panel Block Ready for Removal.



Fig. 5.—A Yard of Finished Concrete Blocks.

adjusted to turn out angle and corner shapes. Somewhat similar to this machine are the Winget and Jackson machines. In the last-named machine the block is made close to the ground, and after being tamped is raised by means of a powerful spring to a table, the core being automatically withdrawn during the process of rising. The sides open automatically, and the block is left on end.

A machine which can be operated by one man, and automatically forms the mold and relieves the block and does both very quickly, is the Walton. This machine turns out "L" blocks 4, 8, 12, 16, 20, and 32 inches in length and 3, 4½, 6, and 9 inches in height, also 10, 12, and 14-foot circles and porch piers. It makes all shapes and sizes on the same pallets.

Capable of making blocks of great diversity is the Noyes F. Palmer machine (Figs. 3 and 9) with its attachments, its molds, 36 different full-size and 288 fractional blocks. Its core holes may be raised from 2 to 6 inches, and being a side-face machine its different face designs are obtained by fastening cast pattern plates against one side-plate of the mold. By a similar means blocks with curved or grooved ends or with faces of different material or color from the body are produced. The completed block on this machine is left in position seen in Fig. 9 by the turning of the two cranks, the upper one throwing open the sides of the mold and the lower withdrawing the cores, and simultaneously elevating the platen which forms the bottom of the mold. To the rear is another completed block.

Special time-saving features have been adopted by the various manufacturers, but the trend in all has been to reach a maximum of production with as little complication of parts as is consistent with perfect work. In consequence, the most pretentious machines have adjustable parts, easily and quickly put into place for all lengths and shapes conformable with the dimensions of the mechanism. Em-



Fig. 6.—A Dwelling Built of Concrete Blocks at a Cost of Only \$4,000.

bodying these time-saving features with simplicity of construction is the Hayden machine, distinguished for its solidity and compactness and for a low position which renders it possible to tamp in the most advantageous manner. Fig. 2 shows a tamper at work, and the ease with which the mixture is reached. The

four sides of the mold are released by levers, and the block is removed by a wooden pallet without being disturbed.

The twentieth annual report of the commissioners for the Queen Victoria Niagara Falls Park, just presented to the Ontario Legislature, states that the utilization of the falls for power purposes has already reduced the volume of water flowing over by about 7 per cent, or from 222,400 to 205,000 cubic feet per second. Though this has caused no appreciable effect on the falls, a reduction three times as large is in contemplation. The commissioners

consider that the public agitation to restrict the further abstraction of the Niagara River water is well founded. The reports show that eleven American and six Canadian companies are at present using the falls for power purposes, and that ten more charters have been given to companies granting them power to use the falls.

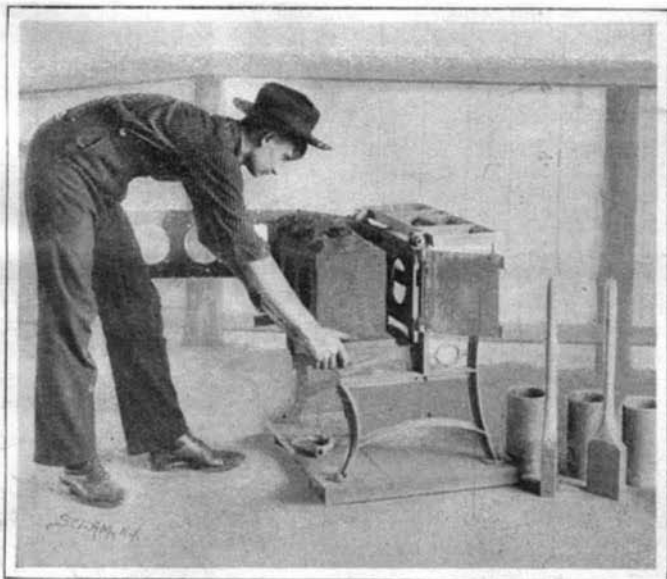


Fig. 7.—The Dayton Machine.



Fig. 8.—Making Concrete Fence Posts.

mechanism is controlled by levers which are simply and effectively operated. When the inside lever has been thrown, the mold is freed absolutely, and the completed block is automatically delivered away from the machine without the slightest jar. In Fig. 1 the advantage which comes from the nearness of the machine to the ground again is evident, the block

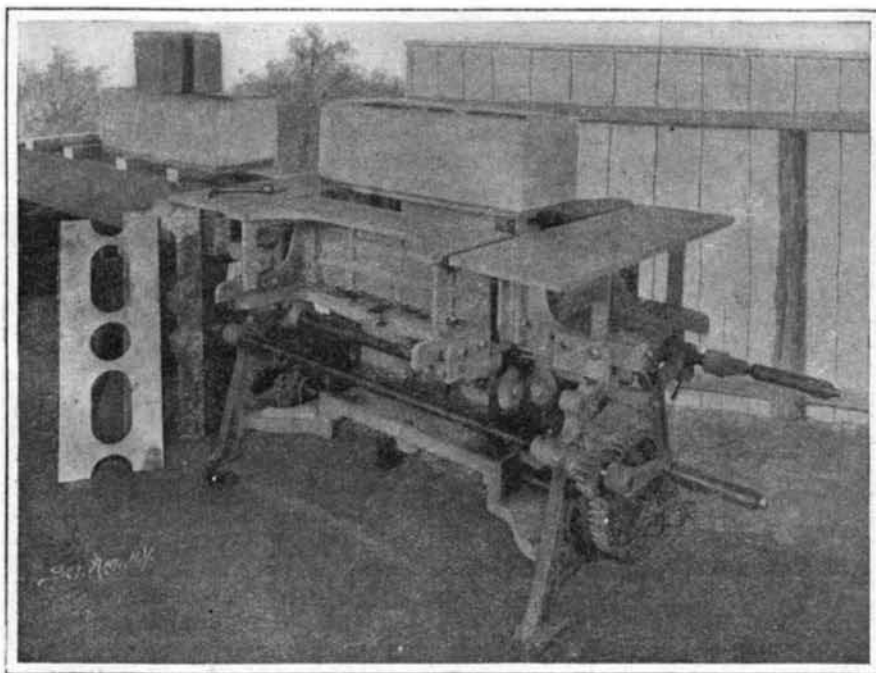


Fig. 9.—N. F. Palmer Block Machine.

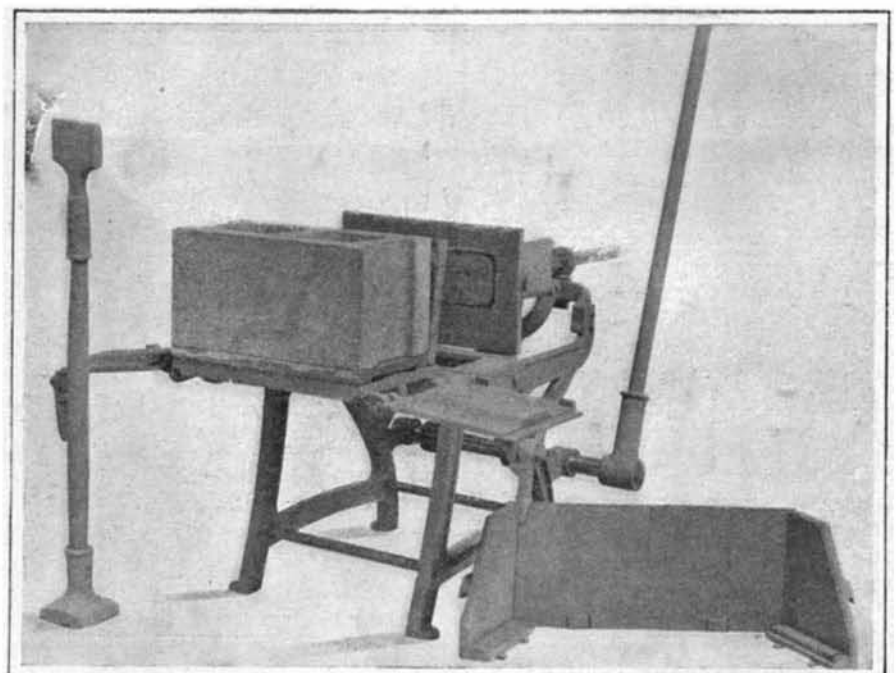


Fig. 10.—Face-Down Machine with Core-Withdrawing Lever.