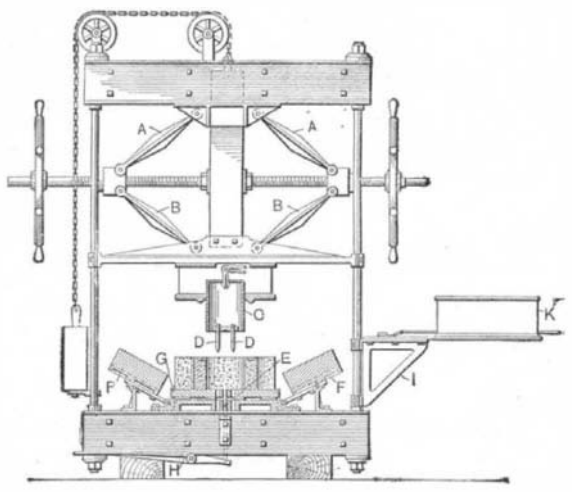
Patent Department

CONCRETE BLOCKS MADE BY POWER.

A power concrete-block machine has recently been invented by a Western architect, Mr. Wallace L. Dow, and introduced by the Perfection Block Machine Company, of Minneapolis, Minn., which does what has never before been accomplished in the manufacture of concrete blocks. Heretofore in making blocks under pressure, it was impossible to drive out the compressed



SECTIONAL VIEW OF THE PRESS.

air, with the result that the blocks were defective. This objection is entirely and simply overcome by Mr. Dow in his machine, so that compressed blocks can now be made as dense within as they are without, free from all voids. The machine in question measures the material accurately, forces it down into a mold under such heavy pressure that all voids are completely filled, and produces blocks which are absolutely uniform in density, strength, and durability. Still more remarkable, it produces from sixty to one hundred blocks an hour with five to eight unskilled laborers at one-half the cost of the usual method. Each block is subjected to a pressure of over one hundred tons. Hence this power machine requires about ten per cent more material than is ordinarily needed, therefore producing a more compact block.

Of the saving in time effected by such a machine, it may be said that 6,000 blocks can be made in ten days. At least sixty days would be required to make the same number by hand on a single machine. In the same time, the power machine would save about $200 in labor. Moreover, the cost of making the largest block is no greater than the cost of making the smallest.

A test conducted at the University of Minnesota by Prof. William H. Kavanagh showed that a plain block made on Mr. Dow's machine cracked at 163,660 pounds and was crushed at 167,200 pounds pressure. Two bevel-face blocks were also tested but gave no signs of cracking or failure, although the testing machine registered its maximum pressure of 200,000 pounds. A rock-face block was cracked and crushed at 97,760 pounds. This last block was imperfect, and would have withstood probably an even more formidable test had it not been broken in shipment to the laboratory.

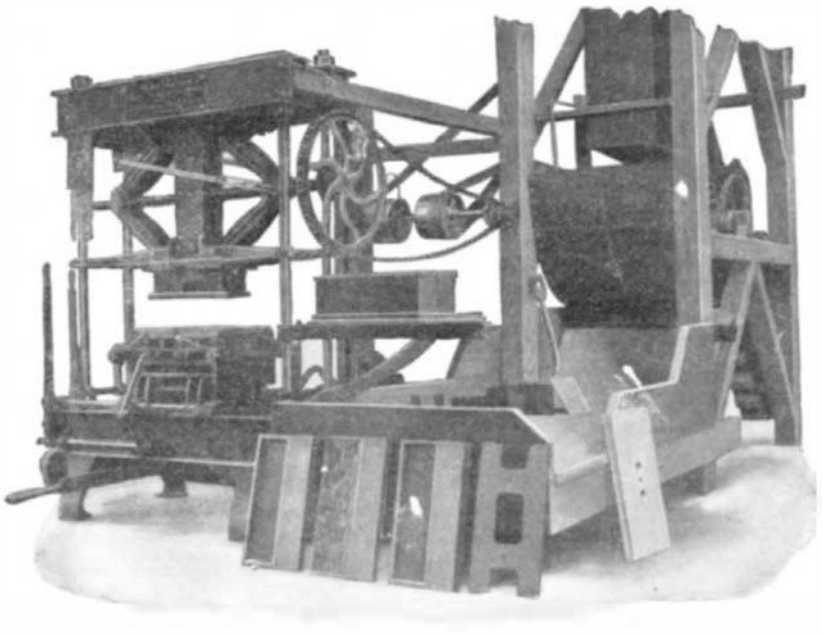
Broadly considered, the press comprises a bed and a reciprocating head, supported and guided by strain-rods. Toggles *A* and *B* threaded on a power shaft serve to raise and lower the head. The striking features of the press, however, are to be found in the arrangement of the mold.

The mold is provided with laterally-swinging sides and downwardly-swinging ends *F*, the sides and ends being so grooved and tongued that when they are thrown inwardly and closed, ready to form a block, they are firmly locked together so as to withstand the enormous pressures to which they are subjected when the head descends. The mold bottom *G* is formed by a plank which rests on the mold bed. It extends out over the sides and ends of the mold, which are carried by their hinges high enough to close in above and not around the wooden mold bottom. The mold bottom is designed to serve as a platen for lifting out and carrying the molded block while it is being dried, and a sufficient number of planks are provided to keep the machine in service. The mold ends *F* carry the core pieces which form half-cavities, and which can be removed to make solid end blocks in the ends of the blocks. The central entire cavity is produced by a core *C*, upwardly removable from the mold, which core is provided with tenons *D* passing through apertures in the mold bottom and serving to hold the core rigidly in its proper position during the formation of a block. A thrust-bar *E* operated by a foot lever *H* loosens the core from the block after compression.

Compression is effected by a follower operated by the toggles and screw mechanism previously mentioned. After the attendant of the machine has thrust up the core of the machine by the pedal-lever, the core is automatically latched to the follower, and withdrawn upwardly from the block with the rising follower. The attendant then swings the ends and sides of the mold away from the block, and two laborers carry it away on the plank which constitutes the mold bottom. By the time they have returned, the machine attendant has placed a new plank in position, unhooked the core from the follower, placed it in position, and closed the sides and ends of the mold, ready for a new charge of sand and cement. Power is cut off automatically at the up-and-down movement, so that the blocks are all of uniform thickness. The height of the block can be adjusted by raising or lowering the top beam of the press.

The charge is carefully measured, in order to produce blocks of uniform density. A measuring or filling box *K* is provided, which is carried by a swinging arm *I* mounted on one of the posts of the machine. This filling box is provided with a sliding bottom, and is designed to be located near the sand and cement mixer, so that it can be conveniently filled. The box is adjustable in height to obtain the right amount of material for different-sized blocks. In charging the mold, the filled box is swung into proper position and the bottom pulled out, the sand and cement falling into the mold around the central core. In order to increase the efficiency of the press, it may be operated in connection with a mixing machine by which the sand, cement, and water are mingled in the proper proportions. The mixing machine and the press are driven by the same 8-horse-power engine.

To the various kinds of blocks that can be made on this machine there is practically no limit. Corner blocks are made for each width in plain, pointed, paneled, tooled, and rock faces. Fractional blocks are made by mounting knives on the mold sides. These knives cut to a depth of 1½ inches, leaving a solid web, so that the blocks can be kept in one piece for curing. When the block (or rather the fractional block) is ready to be laid in the wall, a slight blow will break the web. Knives fastened to the end cores cut the blocks lengthwise in the same manner, and produce fractional blocks which can be used as facing blocks on the end of a first tier or as fillers between joists and between spaces for making walls over twelve inches in thickness. The blocks made are rabbeted on the inside corners to leave a ¾-inch space, which is to be filled with mortar so as to form an absolutely tight end joint, a feat which cannot be performed with the usual type of blocks. The machine is provided with adjustable bay-window molds with angles varying from 30 to 60 degrees; the bay-window blocks can be made in all faces on either inside or outside angles.



CONCRETE-BLOCK POWER MACHINE CONNECTED WITH A BATCH MIXER.

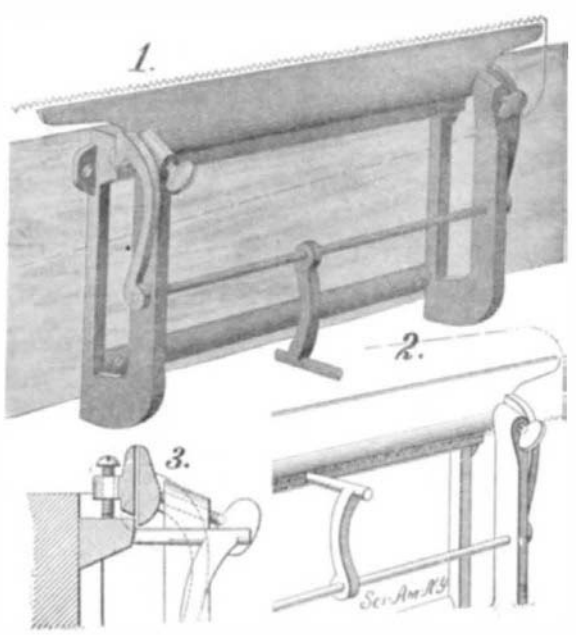
RAILWAY SIGNALING DEVICE.

The frequency of railroad accidents occurring in the very face of warning lights or flags emphasizes the inadequacy of mere visual signals for so important an office as the safeguarding of human life. Many inventors realizing this deficiency of the ordinary signaling system, have devised various auxiliary signals designed to assist in attracting the engineer's attention. One of the simplest of these is illustrated in the accompanying engraving, and it consists in means for automatically sounding a gong in the car or the engine cab, which will warn the motorman or engineer of danger in case he has disregarded the primary signal. Our illustrations show the system as applied to an electric car line, though it will be evident that it could be used equally as well on a steam railway line. The usual semaphores are employed for the primary signals, but contrary to the common practice the semaphore arm extends over the track in such position as to trip a lever carried by the car. As illustrated in the small detail view, when the semaphore arm *A* strikes the lever *B* it acts to sound the gong *C* within the car, thus notifying the motorman that he has passed a danger signal. This gong signal, it will be understood, is not meant to take the place of the primary signal, but serves merely as a precautionary device to prevent total disregard of the signals. In many respects an aural signal is better than a visual one, because it attracts attention even when the motorman's or engineer's attention is momentarily distracted, while tending to the mechanism. One of the principal advantages of this system is its extreme simplicity, and the fact that it may be readily installed by reversing the position of the regular semaphore arms. A patent on this signal has recently been procured by Mr. Michael McGowan, of Togus, Me.

RAILWAY SIGNAL DEVICE.

AN IMPROVED SAW-SET.

Pictured in the accompanying engraving is an improved saw-set invented by Mr. Harry W. West, of 5 Penwell Street, Victoria, B. C., Canada. This device is so arranged as to give any desired set to the teeth, and it also comprises a vise in which the blades may be securely held while the teeth are being sharpened. The saw-set consists primarily of a frame, which may be secured to a work bench. A heavy cross bar at the upper end of the frame serves as an anvil, against which the teeth may be set. For this purpose the face of the bar is beveled, as best shown in the section view, Fig. 3. Above the anvil are a pair of jaws adapted to clamp the saw blade. The inner jaw is pivoted at opposite ends in the frame, and may be adjusted to any desired angle from the vertical by means of a set-screw. The other jaw is also adjustable, being pivoted in the side members of the frame and similarly can be set at any desired angle by means of an ad-



AN IMPROVED SAW-SET.

justment screw. Fig. 1 shows by dotted lines the position of the saw-blade when the teeth are to be sharpened. It will be noted that these teeth project slightly above the clamping jaws in convenient position to be filed. In Fig. 2 we show the position of the blade when the teeth are to be set. It will be noted that the blade is clamped with the teeth resting against the face of the anvil. A rod extends across the frame below the anvil, and mounted on this is a punch which may be swung up against the saw teeth. In operation the punch is struck with a hammer so as to force the alternate teeth of the saw against the anvil, this being permitted owing to the fact that the punch has free lateral movement along the rod on which it is mounted. After the alternate teeth have all been set, the blade is removed and replaced in the vise with its opposite face against the anvil. Thereupon the intermediate teeth are set by means of the punch. By means of the set-screws the jaws may be adjusted to any desired angle with respect to the anvil face, in order to give the saw-teeth the desired set.

STREET CLEANER'S TRUCK.

A very useful improvement in street cleaners' trucks has recently been invented by Messrs. John Rehm and Theodor von Gerichten, of 570 East 149th Street, New York city, N. Y. The principal advantage of the apparatus is that it provides means for conveniently raising and dumping the refuse of the street into the can or receptacle. Furthermore, the receptacle can be readily removed or replaced on the truck, when desired. The apparatus comprises a frame supported on two large wheels and a trailer wheel. At the upper end of the frame are a pair of oppositely-disposed brackets, one of which is indicated at *A* in the engraving. These brackets are formed with sockets adapted to receive the trunnions of the can. Pivoted at *C* on these brackets is a yoke lever, whose lower arms support a dumping pan. The upper arms of this lever form an acute angle with the lower arms, and serve as a handle for the truck. The engraving shows the can resting on the ground in position to receive the street sweepings. The street cleaner can dispense with the usual scoop, and sweep the refuse directly into the pan. This done, the handle is swung over the can to the position indicated by dotted lines. The pan will thereby be raised and its contents dumped into the receptacle. Indicated at *B* is one of a pair of grapples mounted at opposite sides on the frame, and which are adapted to engage and hold the handle so that they can be used for moving the truck to any desired position. The grapples are hinged to the frame so that they can be moved out of the way of the handle when desired. Below the grapples *B* are a pair of hooks *D*, which are adapted to hold the handle in a more depressed position. When engaged by these hooks the handle may be lifted up, carrying the frame with it, swinging the brackets *A* over the axle of the wheel and down the other side, and thus depositing the can on the ground. The can may be readily replaced on the truck by reversing this operation.

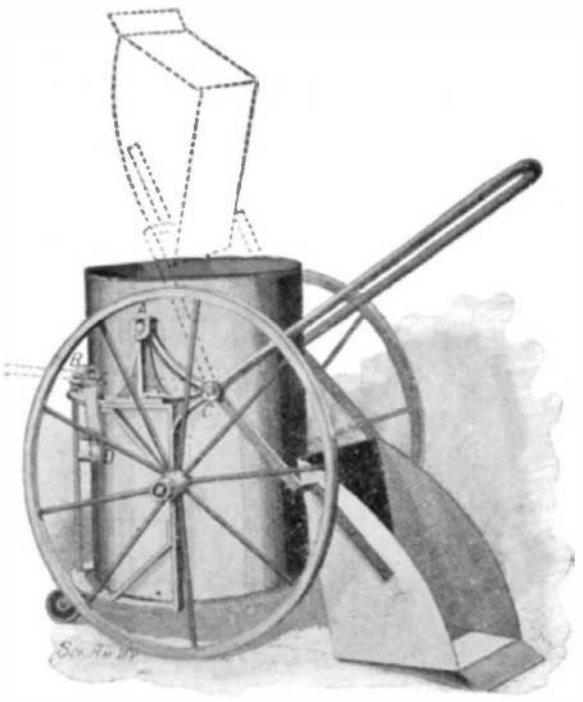
A NOVEL CIGAR LIGHTER.

The common alcohol-burning cigar lighter in which detachable torches are provided is a very convenient device, particularly in a busy store. However, it has the disadvantage that a flame for igniting the torches must be kept constantly burning, thus occasioning a waste of fuel when the device is not in use. Electrical cigar lighters on the other hand use no current except when it is automatically turned on to light a cigar. But they usually possess the disadvantage of being rather cumbrous to handle, as the entire device must be lifted to the cigar, and furthermore the wire connections limit the area over which they can be moved. We illustrate herewith an improved cigar lighter, which aims to combine the advantages of both the torch and the electric lighter. The device comprises a stand with a pair of branching arms in which the torches are placed. At the top is a receptacle for tooth picks or the like. Within the device is a well for oil or other inflammable fluid, and connected with this well are a pair of wicks, which conduct the fluid to the torch receptacles. The torches are provided at their lower ends with absorbent material adapted to soak up a portion of the oil furnished by the wicks. In place of an oil flame for igniting the torches an electrical sparking device is used, consisting of a small spark coil within the stand and a battery for actuating the same, the terminals of this coil being connected to a series of sparking fingers which project through the wall of the stand into a slideway. In use a torch is taken from its receptacle and drawn down the slideway, whereupon a series of sparks will result, due to the contacting of the fingers, and the inflammable material in the torches will be ignited. The cigar may then be lighted, and the torch returned to the receptacle. It will be noted that there is no waste of current, as there is no flow except when the torch is drawn down the slideway. At the same time the cigar lighter possesses all the advantages of the usual alcohol-burning type. A patent on this device has been granted to Mr. George S. Andrews, of 147 North Main Street, Butler, Pa.

Profitable Mechanical Invention.—I.

BY THALEON BLAKE, C.E.

Travelers assure us that even in those remote parts of the world where the name America is but a report, and consequently where a classification of national characteristics is based on no more secure foundation than mere hearsay, each of us is reputed to possess fabulous wealth and marvelous mechanical skill.



STREET CLEANER'S TRUCK.

The false note of exaggeration in this prevalent assumption is manifest; yet there is a pronounced sound of truth in it.

Each of us is at least rich in that inheritance bequeathed by our mechanicians. Besides, the American inventors have made wealth possible to untold thousands of their countrymen, by creating labor- and time-saving machines. Liberal patent laws have stimulated Yankee ingenuity; many have become inventors solely for the remuneration of wealth or fame, and have surpassed expectation.

And the field of invention is not yet worked out. Prizes still await the patient and, above all, the observing men. Yet there has been a great change in the personnel of inventors within the last quarter of a century.

This change has largely been brought about by the mechanical engineers, who follow inventing as a profession. For these men go about their life's work with well-defined plans and aims. Like careful explorers, they select some particular region to explore, and then proceed to explore it systematically. If

A NOVEL CIGAR LIGHTER.

some of them fail of the highest achievement, it is not because of insufficient preparation and of indefinite ideals. They know what they want before they set forth upon their expeditions. They do not end their march in the neighborhood of some North Pole of mechanics, arriving there accidentally, after a meandering march to and fro in some Torrid Zone, aimlessly seeking countries to explore. They have their North Pole in their mind's eye, and strike directly for it.

The result is that inventions are no longer so exclusively accidental, nor the result of inconstant thinking, and of chance experiment. Much of the haphazard progress of mechanics has been eliminated; much of the romance dispelled.

Still, any man may conceive an idea, and a valuable one. The professionals have no corner in ideas. That is impossible.

It is this element of chance which makes the inventing game so alluring to the novice. The fascination of possibly drawing a prize, of stumbling upon a fortune, conquers him. Should at any time an increasing proportion of unprofessional inventors be doomed to little or no returns from their experiments, it is to be ascribed to their having attempted to invent devices already perfected, or even long since antiquated. The fault will be theirs because of an unwise selection of a subject for their meditation and practical improvements. It is of these important truths, and for the benefit of bright young men who evince a love of mechanics, that this is written.

Before considering the prospects of being a successful temporary inventor, let us examine the aspects of professional inventing, and especially the manufacturer's point of view, as well as his relation to the professional inventor. In many of the large factories in which such machines as gas engines, typewriters, arms, bicycles, automobiles, standard farm implements and farm machinery, or electrical supplies are made, mechanical engineers work ceaselessly for improvement of their products.

"If I could get the public to buy new machinery as fast as I can get experts to design it and get it out, I should be very rich in a very short time," said a thriving manufacturer recently. That is true; for in quite a number of large industries, the expert mechanical engineers are far ahead of the actual demands of the trade. No sooner does the public fairly take up with a machine, than along comes a manufacturer with a superior one which his experts may have had perfected months before, and which he may have kept back, waiting for a fit time to introduce it.

Sometimes manufacturers have better models of machines than the ones they offer for sale; they may not be in any hurry to push out these improved machines, as they, perhaps, may have a great deal of money recently invested in the plants in which the older models are made. They may not desire a too hasty change to the better models, as it would necessitate a discarding of old methods of manufacture, sending of expensive tools to the scrap-pile, or dismantling of entire plants.

"But does it not pay to be progressive?" is a question apt to arise in the minds of students and experimenters.

To which query it may be said that all manufacturers of standard types of machinery are very conservative. However, new types will be placed on the markets of the world. Thus it occurs that frequently machines are abandoned before being worn out, because they are rendered obsolete by the incessant improvements of the professional inventors, who are thorough masters in their lines of endeavor and of the conditions and wants of their several markets.

The professional inventors as a body bear an intimate relation to the great industries, some of which would not have been created but for the brilliant work of these gentlemen. There is a growing respect and union between the manufacturers and the professional inventors, which results in profit to both sides, although it goes without saying that the former still gather the lion's share in the matter of dollars and cents.

Why is this so, that manufacturers entertain an unwonted respect for this new class of inventors? Because of the training of this class in mechanics, or in mathematics, or in chemistry, or in advanced shop practice and shop economics. Because, also, of their practical aims and successful solution of practical problems intrusted to them for scientific investigation or improvement.

A professional inventor to be successful in many inventions must have, first, an accurate knowledge of what machines are being built similar in design, or for a similar purpose, to his; and second, above all things, a prescient ingenuity, inasmuch as he must have a correct intuitive perception of how the trade, or the public, needs, and is likely to welcome, his contemplated inventions. Indeed such a man is in the possession of a high order of ability.

It has often been remarked that it is not nearly so difficult to invent, as to find out what to invent. It is, indeed, a veritable stroke of genius to catch a glimpse of an idea which is at once absolutely new and very valuable. But the highly-trained mechanical engineer goes one step farther. He realizes that it is more important to know what not to invent than what to invent, as many machines that are inventable are not also profitable. This is what the professional inventor, from his occupation and association, is especially competent to know.

Thus it will be seen that the amateur inventor has