

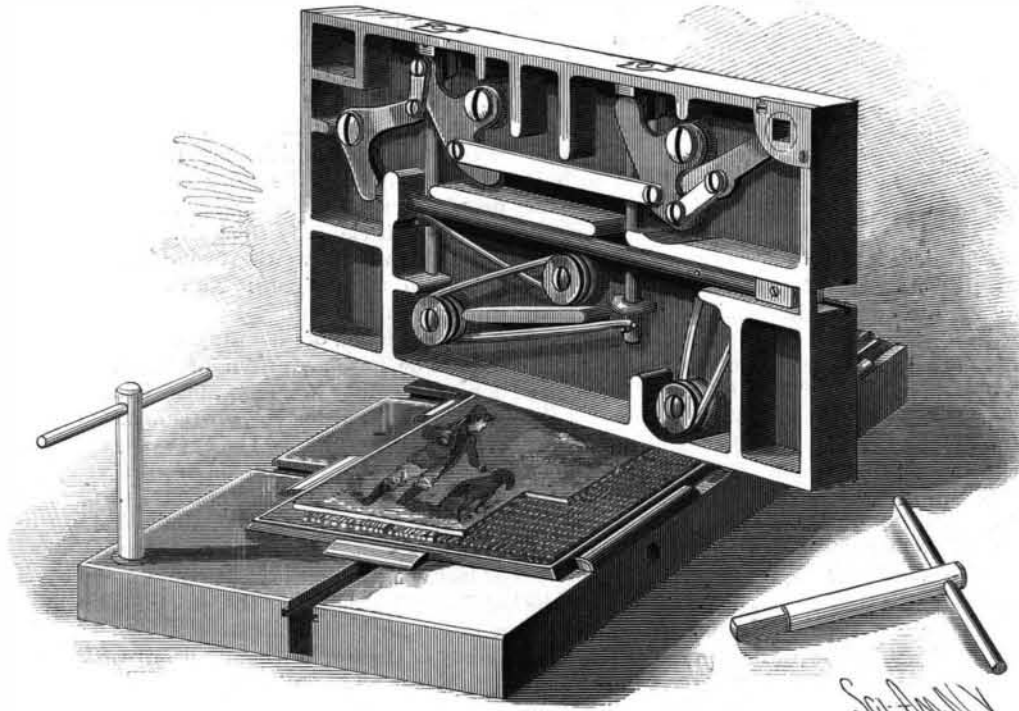
**IMPROVED METALLIC PRINTING BLOCK.**

By means of the metallic printing block which we herewith illustrate, electrotype and stereotype plates can be firmly locked in position or released by the simple turning of a key which actuates certain clamps attached to the block.

The block is of suitable size and shape, and is provided on its upper face, on one side and one end, with two or more fixed clamps; on the other side and end

line, the clamps will remain in their outward position, when the plate can be removed.

To lock the plate in position, the key is turned in the inverse direction until the link has passed its center line with the post, when the springs act to force the clamps inward in contact with the plate, which will be securely held on the face of the block. One of the most important advantages in connection with this block is the fact that the pressman who is printing

**HAWKE'S IMPROVED METALLIC PRINTING BLOCK.**

are two or more movable clamps, which project above the upper surface of the block and move in grooves. Each movable side clamp is secured to one end of a rod sliding in bearings formed below the face of the block. Projecting from the rod near its other end is a lug, against which rests one end of a spring formed of a phosphor-bronze wire, coiled around suitable bolts held on the bottom of the block. Each movable clamp has a downwardly extending lug, against which rests one end of a bell crank lever pivoted to the bottom of the block, and pivotally connected with a bar which connects the lever on one clamp with that of the next following clamp. To one of the levers is attached a link, connecting with an arm secured to a post placed in one corner of the block, and provided with a square recess in which fits a key inserted from the face of the block.

The end clamp is secured to the end of a rod sliding in bearings formed on the bottom of the block, and provided with a pin, against which presses a spring. The opposite end of the rod operates one arm of a bell crank lever pivoted to the bottom of the block and connected by its other arm, by a link, with one of the bell crank levers operating the side clamps.

The operation of this device is as follows:

To release the plate from the clamps, the key is

cut work from fine electrotype plates will find that his overlays will last four or five times longer than when mounted on the usual wooden blocks. In fact, it insures good work from flat plate printing without preparation. This invention has been patented by Mr. John M. Hawkes, whose address is care of A. S. Barnes & Co., No. 111 William Street, New York city.

**IMPROVED GAS ENGINE.**

In this engine the wheel receives two impulses at every revolution, and the construction is such that it is not necessary to revolve the wheel until the charge of gas and air is compressed, as enough compressed air is retained to start the engine. The piston rod guide, supported by the base, is provided with a flange, to which is secured the air jacket, A, of the power cylinder, B, as shown in the sectional view of the power cylinder, Fig. 2. Within the cylinder is fitted a piston, whose rod passes through a gland of the usual form, and connects with the crosshead. The air compressor cylinder is secured to the base axially in line with the other, and its piston rod is connected with the crosshead to which the piston rod of the power cylinder is attached, so that the two pistons move together. The heads of the compressor cylinder are provided with suitable valves, C, for the admission of air. Ports lead from each end of the cylinder to valve chambers, which communicate with each other and with the pipe, D, leading to the air jacket, A, of the power cylinder. In the lower side of the cylinder, B, are formed ports communicating with the valve chambers, E, which communicate through the passage, F, with the exhaust pipe. Air supply ports connect these chambers with the air space of the jacket.

In the lower sides of the chambers, E, are ignition ports, through which the explosive charge in the cylinder is ignited by the continuously burning gas jets, G. In the chambers, E, are placed oscillating valves, chambered on diametrically opposite sides and formed with a small transverse aperture for igniting the charge in the cylinder. To the valve spindles are secured arms which extend upward, and are received in grooved cams secured to the lay shaft, H, which is driven by beveled gearing by the main crank

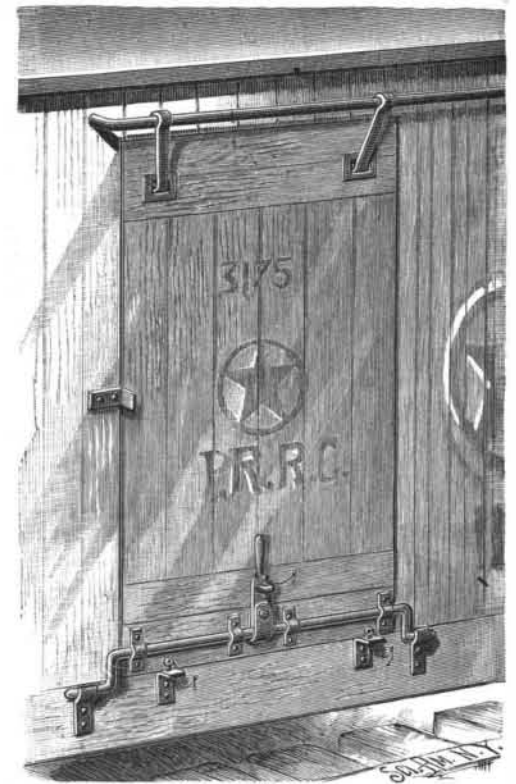
shaft. The cams are so arranged that the valves will admit air from the jacket to the cylinder, igniting the combustible mixture at the proper time in the stroke of the piston, and open at the end of the stroke to permit the products of combustion to escape. The air ports, I, are provided with valves, whose spindles are connected with the rod, J—one end of which is threaded and passes through a nut secured to the air jacket—so that when the latter is turned both valves will be simultaneously adjusted.

Below the air jacket is suspended a gas compressor cylinder, K, one end of which is shown in the enlarged sectional view, Fig. 3, each end of which is provided with a suction valve, L, and discharge valve, M. The upper ends of the valve casings are connected directly with opposite ends of the power cylinder. The piston of the gas compressor is operated by an eccentric on the main shaft, through the intermedium of an angle lever and connecting rods. The spindle of a governor regulating the gas supply is operated through spiral gearing from the lay shaft.

Gas having been admitted to the supply pipe and the jets lighted, the engine is revolved by means of the fly-wheel, thus drawing in air at the air compressor and forcing it into the air jacket. At the same time the gas compressor takes charges of gas from the supply pipe, and forces them alternately into opposite ends of the power cylinder. As soon as the back end of the power cylinder has received a charge of the explosive mixture behind the piston, fire is communicated to the charge by the burning gas in the cavity of the valve. The piston is pushed forward, imparting motion to the crank shaft and to the piston, of the air compressor. The products of combustion in the opposite end of the power cylinder escape through the exhaust pipe. These operations are performed at the other end of the cylinder as the piston moves back. The air in the jacket is subject to compression and expansion, thereby utilizing the heat of the cylinder, which is usually carried off by water employed in keeping down the temperature. This invention has been patented by Mr. Norman B. Randall, of Hancock, N. Y.

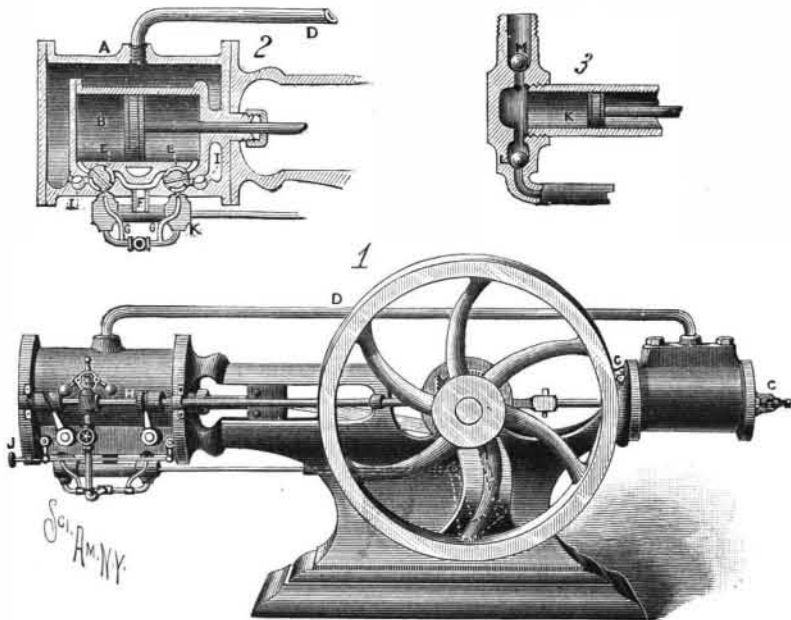
**IMPROVED DOOR ATTACHMENT.**

The object of the invention herewith illustrated is to so arrange the door that, when it is in position to close the opening, its outer face will be flush with the outer face of the car, or other structure, in connection with which it is arranged. Formed in the upper part of the door are recesses, within which are hinged the lower ends of straps, whose upper ends are bent around a horizontal rod secured above the door. The upper and lower edges of the door, and also of the opening, are beveled from the outside upward toward the inside, while each side edge is beveled toward the inside. Held by clips to the lower part of the door is a crank bar having a central handle pivotally mounted within a socket carried by the bar. The crank arms extend downward and outward from either side of the door, and are arranged to enter open brackets secured to the sill of the car, as plainly illustrated in the engraving. Just beneath

**SHEWMAKER'S IMPROVED DOOR ATTACHMENT.**

the door are placed two stops, having outwardly extending flanges, that are apertured to receive pins, which prevent any accidental displacement of the door after it has been closed. In the handle is a slot, through which passes a staple secured to the door, a pin serving to lock the handle in place. When it is desired to open the door, all the pins are removed and the handle is swung downward and outward, thereby partially rotating the crank bar and forcing the lower part of the door outward. The door is then swung clear of the opening, and slides along the upper bar. The handle will turn upon its pivot, and drop out of the way. To replace the door, its upper end is inserted within the opening, the lower end is forced inward, and the lever turned so as to force the crank arms into engagement with the brackets, when the handle is raised to force the door into place.

This invention has been patented by Mr. John W. Shewmaker, of Terre Haute, Indiana.

**RANDALL'S IMPROVED GAS ENGINE.**

inserted in the square recess in the post and the latter turned to bring its arm against the adjacent bell crank lever. This motion forces the levers to swing outward and carry the side clamps in the same direction, and thereby release the plate at one side. As the side clamps commence to move, the end clamp also moves outward by the action of the bell crank lever connected with its rod. The outward movement of the clamps compresses the springs, but as the link on the arm of the key post passes its center