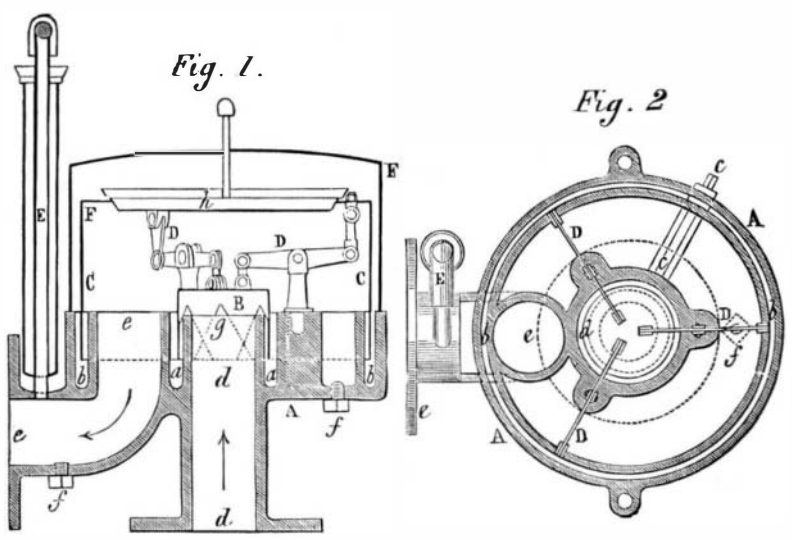
NEW GAS REGULATOR.

The annexed illustration, extracted from the *Bulletin du Musée*, represents a novel gas regulator recently devised by M. Liebda. A cast iron vessel, A, is provided with circular channels, *a* and *b*, which are filled with mercury. *c* is a conduit for emptying them. The gas enters by tube, *d*, and escapes by tube, *e*: and at *f* are screw plugs which close the apertures from which the water which accumulates in the apparatus is removed.

The entry of the gas is regulated by a valve or cover, B, the edges of which, as shown at *g*, are triangularly indented, and are plunged into the mercury in the channel, *a*. A large cover, C, is provided, the edges of which enter the mercury in channel, *b*, and at *h* access may be had to the interior. The covers, B and C, are connected together by the three double levers, D. E is a water manometer for indicating the gas pressure, and finally, F is the envelope which encloses all the working parts.

The gas, on entering *d*, passes under B, and through the triangular indentation in the edges of that valve. It then presses upon the larger cover, C, and, by raising or lowering the same, causes the reverse effect upon B, through the levers, as already noted. As the pressure increases, cover C rises and A falls, and *vice versa*, thus causing the apertures in B to widen and close just so as to limit a uniform flow of gas. To increase the pressure, weights may be disposed upon the cover, C. An economy of from 25 to 30 per cent is claimed to be gained, in the consumption of gas, through the use of this device.



LIEBDA'S GAS REGULATOR.

COTTRELL AND BABCOCK'S PERFECTING PRESS FOR WOODCUT PRINTING—FIRM'S ROTARY ATTACHMENT.

Two features are necessary to obtain a patent: First, the invention must be novel; second, it must be useful; and when these features are clearly demonstrated to the examiners, the exclusive right, for seventeen years, to manufacture, lease, sell, or otherwise dispose of it, is awarded under letters patent.

But there is another feature of importance to the patentee or his assigns, namely, the propriety of his keeping as near as may be within the beaten track of mechanical appliance in his inventions or improvements, in order that the workman, when he takes hold of the new machine, may feel a certain degree of familiarity with its mechanical principles, and thus be enabled to prosecute his labor with equal confidence as formerly, when engaged on the old and superseded machinery. During nearly half a century of careful and patient observation, we have noticed several really valuable inventions fall stillborn to the world because of a non-observance of this common sense theory. The inventor may feel satisfied that he sees clearly his means to an end, irrespective of the reasonable convenience of those for whose uses the invention is designed; but the workman cannot appreciate the value of an improvement which compels him to learn his trade over again. In such cases, it will necessarily be uphill work with the inventor to introduce his machine; and he displays a lamentable lack of knowledge of human nature if, in his disappointment, he attributes his want of success to the stupidity or stubborn prejudice of the workman. On the other hand, when improvements which are the results of new combinations of existing and well understood agencies are presented to the public—properly constructed and divested of every possible complication—they seldom fall short of usefulness and pecuniary profit to all parties concerned.

The new perfecting press which is illustrated in the above engraving seems to belong to the last mentioned class of inventions, a careful examination of which will present nothing unfamiliar to the modern pressman. It is simply a union of the rotary and drum cylinder presses, preserving the features of both with the greatest simplicity. Take off, in imagination, the type and impression cylinders and the second feed boards and piling apparatus, and we have the Cottrell improved four-roller printing machine remaining, without variation or modification. We shall proceed to describe the complete machine in a manner that will be understood by the craft for which it is designed, avoiding shop terms and speaking in the language of the pressroom.

Its foundation is the latest Cottrell and Babcock drum cylinder press, embracing the Cottrell improved air spring and governor, the whole so substantially built as to sustain the new rotary attachment without vibration, even when running at its highest rate of speed.

The patent rotary attachment consists of two cylinders—one for curved stereotype plates of the matter to be printed, the other to give the impression. These cylinders are supplied with a feed board, and revolve in harmony by the instrumentality of the usual gear wheel attachment, making two revolutions while the drum cylinder of the main press makes one, and yielding the sheet, when printed on one side from the curved stereotype plates, to a supplementary set of grippers on the drum cylinder, in perfect register, when it passes to the flat form on the bed of the main press, and is printed on the other side and piled in the usual manner.

The type cylinder is supplied with an ordinary distributing apparatus for three form rollers; and as it revolves twice before printing, the form is necessarily rolled twice also, with a fresh supply of distributed ink each time—an excellent feature in itself. There are four vibrating rollers, which thoroughly break up and distribute the ink before it is contributed to the form rollers. The space on the type cylinder not occupied by the curved plates serves for the ink table; and a simple device raises and drops the vibrators at the right times and places, thus avoiding all contact on their part with the stereotype plates.

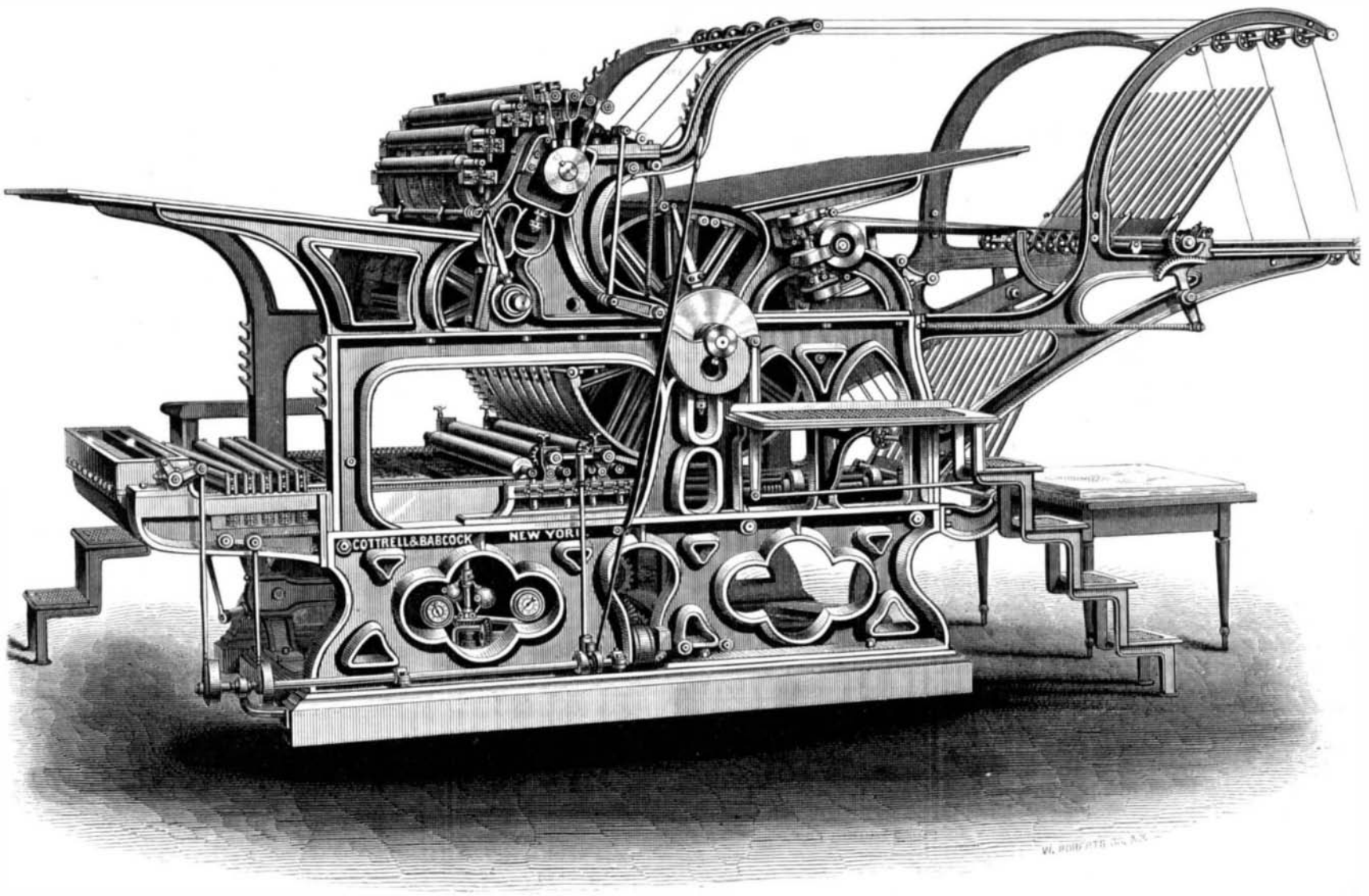
At each alternate revolution of the impression cylinder the impression is thrown off by a simple and reliable mechanical device, by which means the complete rotary attachment (as it gives the impression on its second revolution) works in harmony with the drum cylinder of the main press.

The great difficulty that most perfecting presses have to contend with is their tendency to set off. This difficulty is thoroughly overcome in the press under consideration by the introduction of slip sheets, which are fed to the drum cylinder, the grippers which carry the slip sheets being so manipulated as to hold each sheet for two impressions before yielding it to the piling apparatus, where it is smoothly and evenly piled for future use.

These presses being designed particularly for illustrated periodicals of large circulation, the plain forms are printed by the new rotary attachment, and the cut forms on the flat bed of the main press by the drum cylinder. The superiority of the Cottrell air spring and governor attachment over the old coiled wire springs enables a press of the printing magnitude of 42 x 60 inches to keep up a durable speed of over 1,200 impressions per hour. After allowing for the time consumed in making ready forms of long numbers, and the stoppages incident to removing printed paper and supplying fresh piles to the feed boards, the manufacturers assert that an average of over 10,000 sheets per day, printed on both sides, will pass through the machine. The new patent rotary attachment accomplishes its share of the work independently, and in proper season to pass the half printed sheet to the drum cylinder to be perfected without interfering in any way with the time of the main press; so that we thus have a clear issue of more than 20,000 single impressions per day of ten hours.

The usual method of making ready this class of illustrated work is by hard packing, the overlays of the cuts being made from certain cardboard, well known to the practical cylinder press printer, and the whole finally covered by a blanket of well worn billiard cloth. On the drum cylinder of the main press, of course, the *modus operandi* is the same as on the ordinary drum cylinder machine; while the rotary attachment is supplied with the necessary conveniences for the same class of make-ready.

We have thus, we believe, given an intelligible description of this new perfecting press, from which it will be under



COTTRELL AND BABCOCK'S PERFECTING PRESS FOR WOODCUT PRINTING