Autographic Printing Press.

The annexed engraving represents a new printing press, designed to take the place of the lithographic press, and, through certain improvements described below, claimed to be adapted to common as well as the finest work.

The lithographic press now in use has two strong side frames, which sustain all the working parts of the machine, namely: The box for the scraper, the long pressure-screw, a strong iron bed running on twelve iron rollers, a tympan, a long lever, and a very strong iron roller giving motion to the iron bed on which the lithographic stone rests. These attachments make the press very heavy, and its management requires experience and skill.

The press herewith illustrated consists of a wood or iron frame (according to its size), a weight of five pounds acting on a combination of two levers, two connecting rods, a printing cylinder, and a curved stone.

It will be seen that the old flat stone is replaced on this press by the curved stone, on which it is claimed the finest work is obtained with great facility by unskilled attendants, as well as by a practiced hand. It is also claimed that the difficulty arising from the liability of the stones to break on the old press, is entirely obviated in this press whatever may be the pressure to which the stone is submitted.

The reasons assigned for this are that the ordinary presses give an unyielding pressure. The scraper must pass, or the stone will be broken; while with the new press the pieces are not so rigid, all the parts are mobile and flexible, and the levers raise or fall, adapting themselves to all irregularities in the stone although the pressure remains constant on all points. Practical printers will at once understand the nature and value of the advantage thus secured.

The absence of a tympan results in a saving of seven motions required for an impression out of the eight motions required for the same on the old-style press, and it is claimed that a young boy can take off with it one hundred and fifty impressions per hour, without difficulty.

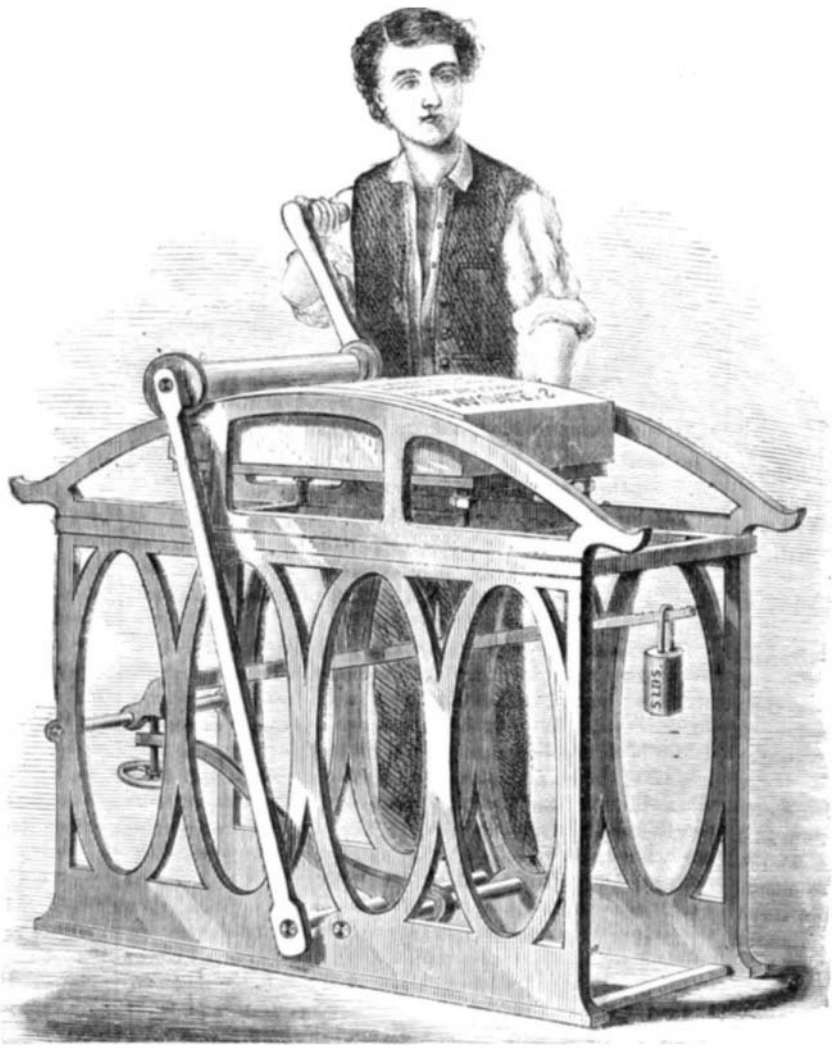
In the use of the old press the regulation of the pressure on the stone is a source of great perplexity and trouble, as a slight mistake in this regard may break a stone on which a costly work is prepared. This difficulty is not encountered with the press under consideration. All the attendant has to do is to push forward or backward the five-pound weight of the first lever to a point which will give the pressure required.

This press may be shipped in a condition to use immediately on its arrival at its destination, thus obviating expense and trouble in setting it up. It weighs only one fourth as much as the ordinary press designed to do the same work, and it can be run by either hand or by steam power—a thing impracticable with the old press.

In consequence of the peculiarities of construction described the stone can be about the length of the press, say for a No. 1 press about twenty-four inches by twelve inches.

It is claimed that the simplicity of this press and the fine work it is capable of performing adapt it particularly for office use by companies, architects, lawyers, schools, copyists, artists, clergymen, and business men generally, who often want a number of fac-similes of circulars, letters, price lists, music, drawings, plans, and documents.

The invention is covered by two patents obtained through the Scientific American Patent Agency, bearing date respectively February 28, 1868, and May 24, 1870, by C. Maurice, whom address for further information, at 160 William street, N. Y.



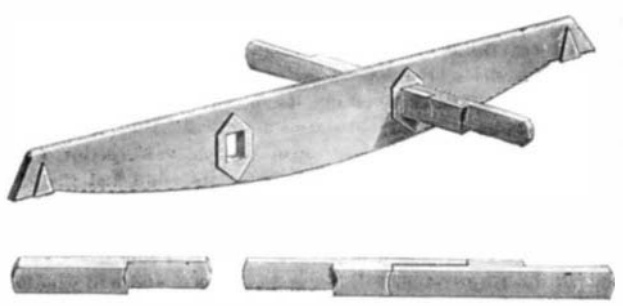
MAURICE'S AUTOGRAPHIC PRINTING PRESS.

Barometric Prediction of Weather.

The barometer corresponds by no means with the tumultuous changes of the weather, but with those of its average quality. What, then, is the period of time for which the averages should be taken to obtain results corresponding most closely with those of the barometer? Numerous trials showed that period to be about twelve hours, and the correspondence of a curve drawn on that principle with the barogram was fairly satisfactory. The flexures of the two curves are, on the whole, simultaneous, since neither curve habitually anticipates the other, but they are seldom absolutely simultaneous. They correspond in the extreme positions as closely as in near ones, proving that it is not the absolute hight of the barometer but the variation in its successive hights which indicates change in weather. The superior influence of the wind upon the barometer over both temperature and damp was remarkably apparent. Lastly, the influence of temperature and damp were shown to conform to the already described period of twelve-hour averages. A simple formula of prediction was constructed on these data. It included (1) the difference between the first and second of two barometric readings, six hours apart; (2) that between the average velocity of the wind during two periods, which we may call *c* and *a*, of six hours each, *c* succeeding the last barometric reading, and *a* preceding the first reading, the intermediate period *b* necessarily disappearing from the formula; (3) half the difference between the average temperatures during *a* and *c*; (4) the same as regards vapor tensions. Then it was shown that (1) was equal to the sum of the remainder, when the barometer and vapor tensions are reckoned in hundredths of an inch, the velocity in miles per hour, and the temperature in degrees Fah. The reason why the barometer is influenced by the weather in a twelve hour period of average, and why it may predict coming weather, was illustrated by supposing a similar instrument to be plunged into troubled water, in which case its movements would not sympathize with each ripple that passed above it, but with the mean level of a considerable area, and therefore it would feel the influence of an approaching wave as soon as it had reached the area in question whenever the wave was one of exceptionable magnitude. A calculation was made with the above formula to determine the average velocity of the wind for a large number of six-hour periods, and the predictions were compared with facts. It was found that the average error of the predictions was one-third larger than if the observer had simply guessed that the average wind velocity would continue unaltered for the next six hours. The reason why the errors are so large is, first, that correctness in the result depends upon the correctness of all the elements of the formula, but the values of these are only true on the average, while in each particular, and in each case, there will be more or less deviation from that average; secondly, any error in the expectation of the twelve hours' average is, on the whole, doubled in the six hours' prediction, because the difference between what is expected of the whole, and what was fulfilled in the first half of it is heaped on to the second half, which has therefore to bear an additional burden of error equal to what rightly belongs to it. The fame of the barometer is due to its success in predicting a type of storm very rarely met with in the British Isles, but frequently in hurricane latitudes, where the fall of the mercury far outstrips the increasing severity of the weather. In ordinary gales, and much more in ordinary weather, the author considered the barometer to be absolutely useless as a guide when it is consulted without a knowledge of what is occurring at adjacent stations—in short, without such information as is supplied by the daily weather report.

HUTCHINSON'S LOCKING GRATE BAR.

Our engraving illustrates an improved form of grate bars,



which are kept in their relative positions to each other and prevented from warping by one or more sectional rods or bars passing through the grate bars crosswise of the furnace, thus locking all the grate bars together, and keeping the upper edges of the same all on a common level. This constantly maintained level surface facilitates the cleaning and slicing of fires, which can only be done imperfectly on an uneven grate.

The bars are made thin and rounded at the top to secure the greatest amount of air space possible. Thin bars, properly supported, do not suffer so much from heat as thick ones, as they are more rapidly cooled by the air currents.

By this arrangement it is possible to change the air spaces between the bars for burning different sizes of coal. This is done placing between the bars slotted pieces of metal, corresponding in shape to the lugs upon the sides of the grate bars. These pieces rest upon and partly embrace the cross bars, and adjust the grate bars to the proper width of space These bars can be put in any common furnace without alteration.

Patented, Sept. 27, 1870, by R. A. Hutchinson, Nos. 95 and 97 Liberty street, New York Whom founderymen and others desiring State, county, or shop rights may address for further information.

Mahogany Cutting in Honduras.

Mr. E. G. Squier, in his "Honduras Descriptive, Historical, and Statistical," says:

"Of all occupations known to man, that of the mahogany cutter is perhaps the wildest in its nature, and yet among the most systematic in its arrangements. When the cutter has fixed upon the valley of some river as the field of his operations, he makes a depot for storing provisions, and for securing and embarking the wood. Here he maintains a little fleet of pitpans for carrying supplies and keeping up relations with the "works" proper, the sites of which are determined chiefly by the abundance of trees, their accessibility, and the means that exist for feeding the cattle which it is necessary to use in "trucking" the wood. To these points it is often necessary to drive the oxen through thick and untracked forests, and to carry the chains and trucks, by means of small boats, against strong currents, or over shallows and rapids, which are only surmounted with infinite labor. The site once definitely fixed upon, the next step is to erect temporary dwellings for the men—a task of no great difficulty, as the only requisite is protection from the sun and rains, which is effected by a roof thatched with long grass from the swamps, or with "cahoon" leaves, or the branches of the thatch-palm. A hammock swung between two posts, two stones to support his kettle, and the hut of the cutter is both finished and furnished!

"The mahogany season, which last some months, commences in August of each year, it being the opinion of cutters that the wood is not then so apt to split in falling, nor so likely to 'check' in seasoning, as when cut from April to August, in what is called 'the spring.' Furthermore, by commencing at this period, the cutter is enabled to get down his wood, and prepare it for trucking by the setting in of the dry season.

'The laborers are divided into gangs or companies of from twenty to fifty each, under the direction of a leader styled 'a captain,' who directs the men in his company, assigns them their daily tasks, and adds to or deducts from their wages in proportion as they accomplish more or less than what is supposed to be a just day's work. Each gang has also one person connected with it, who is called a hunter, whose duty it is to search the 'bush' for trees proper to be cut. His work, therefore, commences somewhat earlier than that of the others, and as it involves activity and intelligence, he is paid much higher wages than the mere cutters. His first movement is to cut his way through the thickest of the woods to some elevated situation, where he climbs the tallest trees he finds, from which he minutely surveys the surrounding country.

"Around Belize the mahogany-cutters are chiefly negroes, descendants of the slaves who were formerly employed there. But in Honduras they are principally Caribs, who, in activing and strength, are said to excel the negroes; they are also more intelligent, and require less care and superintendence. Many of them go annually to Belize, and hire themselves for the season, returning to their homes at its close."

Tempering Carriage Springs.

A correspondent of the *Coach-Makers' International Journal* writes: In setting up old springs where they are inclined to settle, I first take the bed leaf and bring it into shape; then heat it about two feet in the center, plump to a cherry red; then cool it off in cold water, as quick as possible. This will give the steel such a degree of hardness, as to be liable to break, if let fall on the floor. To draw the temper, hold it over the blaze, carrying backwards and forwards through the fire, until it becomes so hot that it will sparkle when the hammer handle is drawn across the edge; then cool off, or not, just as you please.

Another mode, I use sometimes, is to harden the steel, as before stated, and draw the temper with oil or tallow: tallow is the best. Say, take a candle, carry the spring as before, through the fire, and occasionally draw the tallow the length hardened, until the tallow will burn off in a blaze, then cool.

I have no difficulty in making springs stand up. Every leaf is served alike.

LINSEED OIL only should be used in drilling carriage work