

the ribs, and when the matrix reaches a point directly over its appropriate channel, all of its teeth are, for the first time, disengaged, and it is permitted to descend by gravity into the magazine, there to remain until all of its predecessors in that channel have been called into use.

A simple mechanism is provided for transferring the matrices, one at a time, in rapid succession, to the distributor bar, and for carrying them along the bar to the points of discharge. The organization of the machine is such that the manipulation of the keys to assemble the characters for one line, the casting of the preceding line, and the distribution of a still earlier line, are carried on concurrently and independently. The machine is operated by a small expenditure of power. Its principal parts move slowly, and the task of the operator is limited to the manipulation of the finger-keys and the simple movement required to start the line. As soon as one line is completed and started to the caster, he proceeds to set up another line. The keys are operated with a lighter touch than those of a typewriter. The capacity of this machine, as now speeded, is from 8,000 to 10,000 cms per hour.

Fig. 3 is a perspective of the complete Mergenthaler linotype machine.

*The Munson Method of Power Type Composition* has been recently simplified and improved, so that features formerly criticised or excepted to by practical printers have been eliminated. It has been considered that most of the typesetting and composing machines heretofore placed before the public were limited in their capacity for work by the ability of the operator, and that, with the average manipulation, from one-half to three-quarters of the capacity of a well-constructed machine remains idle. The object of Mr. Munson's inventions is to overcome this defect in typesetting machinery, and to make it possible to work up to the absolute maximum speed. He uses three machines, viz.: A preparatory perforating machine, a typesetting machine, and a type-distributing machine. The preparatory perforating machine is small and simply constructed. It is provided with a keyboard that can be worked by any typewriter operator at any time or in any place, and the result (a strip of paper having a series of transverse rows of perforations) can afterward be used to operate the typesetting machine. By this plan two, three, or possibly more persons can be employed simultaneously in keeping one typesetting machine constantly at work. This preparatory or "compositor's" machine works as follows: To each letter, point, figure, space, quadrat, etc., is assigned a particular row of perforations in the ribbon, the rows being made to differ from one another by changes in the combinations of their perforations. The operator has only to see that he depresses the proper keys in their right order, the machine itself taking care of the combinations and insuring the correct perforations of the ribbon. The operator determines as he goes along where each column line of type shall end, in substantially the same way that a typewriter operator decides where each line of typewriting shall end. That is, he is guided by an index moving along a graduated scale, and also by the sound of a bell that is struck automatically a little before the end of the line is reached, just as the typewriter operator is guided by the "carriage scale" index and bell of that machine. When the end of a column line is thus fixed upon by the operator (whether the division comes after a word, after a hyphen dividing a word, or after a point, figure, or other character), he marks the terminus of the line by touching a key that causes to be inserted at that point in the ribbon a row of perforations that represents a peculiar type, called the "line divider." He then proceeds in like manner to compose the next line.

The typesetting machine has no keyboard, but is automatic in its action, and is operated entirely by mechanical power, its work being directed by the perforated strip. Automatically it does the following things: (1) It sets matter in a long, continuous line of type, this line consisting of a succession of separated short lines, each of which has the requisite length and the proper terminal division to make it, when spaced and justified, a correct and suitable column line. (2) It spaces evenly, and justifies with exactness each of such column lines, and then deposits it with the column of type on the galley. (3) When matter is required to be leaded, it inserts leads between the lines of type as they are moved on to the galley.

The type used with these machines is the ordinary type made and sold by typefounders. The power type distributor is entirely automatic; that is, it will not require the "dead" matter for distribution to be fed into it by hand, but a whole page or column of type may be placed on its table, and the machine itself will do the rest. It separates the foremost line of type from the others, and then picks off each individual type and places it in its proper reservoir.

*The Electric Linotype Machine*, based upon the inventions of Mr. Shuckers, and further improved by Mr. Homer Lee, is an automatic type-bar casting machine, differing from the Mergenthaler and Rogers machines in that, instead of using female characters of the matrix order, it employs male or cameo characters secured to the ends of bars arranged in the arc of a circle over a key-assembling channel, the bars being arranged in lines radial to their key channel. Any number of bars with like characters may be used. The bars are released, one at a time, by electro-magnets operated from a keyboard. When released, each bar falls by gravity with its type end in place in the assembling channel in front of the operator, each succeeding bar, as it falls, taking its place alongside of the preceding bar. The automatic justifying spaces are similarly released by a proper key and electro-magnet to fall in place between the type bars, and when the line is completed the machine automatically clamps the types in place, and at the same time moves the justifying spaces simultaneously all to equal distances, so that the line is automatically justified at the time it is clamped rigidly in place. The soft lead bar is then fed beneath the line of clamped type bars, and is moved up into forcible