same work could be done by hand, but the distribution is not so rapid as that done by a compositor in distributing to a case.

(63) *The Thorne combined type setting and distributing machine.*—This remarkably simple, ingenious, and efficient machine was exhibited in two places in the United States section; in the space allotted to the Thorne Typesetting Company of Hartford, Connec-

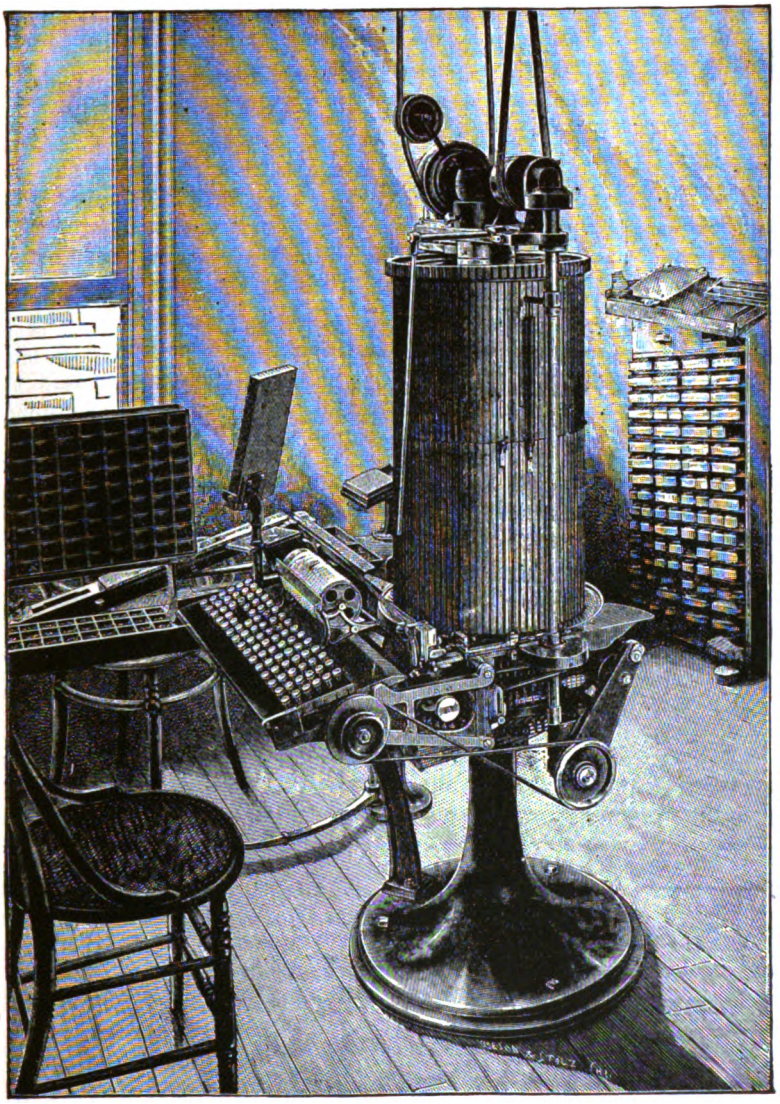

FIG. 14.—The Thorne type setting and distributing machine.

ticut, and in the Edison space, where it was shown in use in connection with a phonograph, the utterances of which served in the place of copy for the compositor.

A general view of this machine is shown in Fig. 14. Only a brief and very general notice will be given here, as the machine, which has become known in our own country within the past two years, can be seen in operation in many printing offices, and accounts of it have been published in our journals. The following is taken from one of the company's circulars:

The Thorne typesetting machine consists of two iron cylinders, about 15 inches in diameter, placed perpendicularly one above the other, in the external surface of each of which are cut longitudinally ninety channels or receptacles for the types which are to be used in it. Within the channels of the lower cylinder are inserted "wards," or small steel projections extending in various relative positions through their entire length, which correspond respectively with "nicks" specially made in the type, the purpose of which is, in distributing the letters, to automatically divert each letter from the mass of letters in the upper or distributing cylinder to its appropriate place in the lower or setting cylinder, so that each channel in the latter shall receive types of only the particular character intended for and adapted to it. The work of distribution is thus carried on automatically by the revolution of the upper cylinder upon its axis, which in rapid succession places the various types in position to be released from the distributing cylinder, when they instantly drop of their own weight into orderly position in the proper grooves of the setting cylinder, as above indicated. The typesetting is performed by manipulations upon a keyboard on which the characters of the language are represented, very much as upon an ordinary typewriter. These keys communicate directly with the setting cylinder above mentioned, each stroke of a key releasing a letter, and, by the aid of a revolving disc, transferring it from its channel in the cylinder to its place in the continuous line of reading matter which the operator is "setting." This continuous line is broken up into shorter lines and justified to a proper length for the columns of a newspaper or the pages of a book, according to the work on which the machine is employed.

The process of distributing the types is carried on, as before indicated, automatically, and with very much greater rapidity than and at the same time with the setting. When the setting cylinder is full the distributing cylinder ceases to revolve, but may be started again instantly at the will of the operator whenever it becomes necessary to replenish the former; and thus the distributing mechanism is active or at rest according to the demand made upon it by the activity of the operator. It is an exceedingly interesting feature of the machine, which alone gives it great advantage over hand work, that no time is required to "fill the cases," the automatic distributing cylinder rendering the supply of types in the setting cylinder continous and inexhaustible.

Three persons are required to operate each machine: one at the keyboard, a second to break up and justify the lines, and the third to keep the distributing cylinder "loaded" and maintain a general supervision. With expert help one machine will set and distribute 6,000 ems per hour, or from five to six times as much as the most rapid hand compositor. The work is not particularly laborious, and it is found by experience that intelligent girls are fully as well adapted as men to become efficient compositors. * * * The machines are so light running that a single horse-power is sufficient for half a dozen of them.

The type board is skillfully arranged. Some of the letters are repeated several times, and their arrangement is such that the keys for the letters forming certain prefixes and terminations of words that are most frequently used, such as *re*, *con*, *ed*, *al*, *ion*, etc., and

short words that are often needed, such as *an, at, in, the,* etc., can be touched simultaneously and yet the type follow each other in the proper succession, one movement of the hand only being required in setting such combinations.

This machine was not properly presented to the attention of the jury, and failed to obtain the award it deserved. None of the other machines exhibited could be compared favorably with this one, either in scope or rapidity of working. It is thoroughly practical.*

CLASS 59.

(64) Under the denomination "Machines and implements for miscellaneous industries and arts," this class contained those machines and tools, adapted for a great variety of manufactures, which were not named under the more general heads which designated the subdivisions of the other classes. It embraced typewriters, paper-bag machines, cash registers, etc., and to it were also assigned numerous ingenious machines and implements used by those manufacturers who work on a limited scale, and are engaged in making the great variety of articles known in the French market as "article de Paris," and the different articles formerly known in the United States as "Yankee notions," as, for example, toilet pins, hair pins, brushes, combs, eyelets, covered buttons, match boxes, keys for musical instruments, corkscrews, and a multitude of objects difficult of classification except as "miscellaneous."

The extensive displays made by the departments of the French State manufactories and the mint were assigned to this class; they included machines and tools for the manufacture of tobacco, also coining presses, and machines for weighing and sorting coins. These two great government exhibits were the only ones which received grand prizes in the class.

(65) Twelve gold medals were awarded in all; of these France received seven, the United States three, and Great Britain two.

The limitations which prevent a full report in detail upon the objects in every class apply also here, and a few only of the most important exhibits, particularly those which gave the United States a representation in Class 59, will be noticed.

(66) *Typewriters.*†—Few exhibits attracted more general interest than the typewriting machines. During the busy hours of the day, from 2 until 6 p. m., the portion of the United States section devoted to typewriters was blocked by eager and curious spectators, some seeking for specimens of work, others bent upon an investigation of

*The company has sold ninety machines within the last 6 months, and the demand is increasing so rapidly that facilities for producing twenty machines per month have been provided.

†The greater part of the notes on typewriters was furnished by an expert in this specialty.