### A MACHINE THAT SETS ORDINARY TYPE.

BY M. M. HUNTING.

Nearly everyone is more or less familiar with the type-setting machines that are in daily use in our large newspaper and printing offices, which cast the type from molten metal as the machine is operated. To build a machine which would set ready-made type has been the ambition of a number of inventors for some years past. The most recent solution of the problem is embodied in a machine invented by Mr. A. G. Baker, of Albion, Mich.

The machine has a capacity of setting ten lines of type per minute of ordinary column width, or technically speaking, ten thousand ems an hour, as against a record of six to seven thousand ems on the older machines.

The upright portion of the machine is called the magazine, and consists of ninety channels containing the different letters of the alphabet, punctuation marks, and other characters used in printing. Each channel is just wide enough to contain the character allotted to it without allowing it any more room than it requires to slide up and down easily. The channels are entirely independent of one another, so that any of them can be removed from the machine if desired without disturbing the others.

The first channel at the right is but eight inches long, while each succeeding one is one-eighth of an inch longer, so that the lower end of the magazine is inclined from right to left, the top being level.

The type is set by pressing the keys on the keyboard, as in other type-setting machines. When a key is pressed, it operates a plunger, which enters its corresponding channel from the rear, and pushes the lower piece of type out into the inclined guide plate in front, whence it is carried by gravity to the assembling point at the lower left-hand corner of the machine. The guide plate is so tilted that those characters which are farthest from the assembling point will travel fastest when released from the magazine, because of the greater inclination of the plate at that end, while those nearer travel more slowly. Consequently, all arrive at the assembling point at the same time. This enables one to operate the machine very rapidly without the danger of transposing letters.

As the letters reach the angle in the guide plate at the lower left-hand corner, a sort of escapement action, actuated by a spring concealed in the base, and operated by the depression of the keys, places them on their feet in line ready for removal at such time as may be desired.

One of the machine's most ingenious features is the distributing mechanism, which operates backward and forward across the top of the magazine, similar in action to the carriage of a typewriter. This part of the machine contains a number of channels, like those of the magazine, except that they are much shorter. In each channel of the distributer a line of type is placed, and as the keys are pressed in the setting of a new form, the distributing device moves backward and forward one space at a time. At the top of each channel of the magazine, and extending about one-third of the way across the opening, are steel strips called "wards." Each ward has a number of protuberances upon its surface, corresponding in number and shape to the nicks on the side of each type character. The ward and its corresponding type character will fit each other perfectly, but neither will fit any other except its own counterpart. As the distributer moves across the top of the magazine, each piece of type is tested against the wards until it finds its corresponding ward, and falls into its own channel. In this way the type is distributed without any extra effort on the part of the operator, and coincident with the setting of a new form.

The machine has been designed to set all standard sizes and styles of type. Type having the same sized body, no matter what variation there may be in the face, may be used in the same machine indiscriminately; but where there is a difference in the size of the body, adjustments have to be made in the machine to accommodate the change.

The fact that the machine requires no power for its operation, and no gas or other heat for melting metal, adapts it particularly well for the use of country newspapers, that have been unable heretofore to make use of the advantages offered by such machinery, owing to the lack of proper facilities.

The machine is most advantageously operated by two men, one setting the type and the other spacing the lines or justifying them, as it is commonly called.

All corrections in the proof are made from the ordinary case of type, as this requires less time than making the changes with the machine.

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### A New Technical School for Women.

Teachers' College, Columbia University, will open in September a studio and laboratory building costing over half a million dollars and devoted to its new School of Household Arts. This equipment, comprising a six-story building, 160 x 60 feet, fully furnished for its purpose, is dedicated solely to instruction in the arts and sciences upon which rational household living depends. One floor devoted to foods and cookery, another to textiles and needlework, another to the application of chemical and biological sciences in matters of household concern, studios for instruction in the artistic aspects of the house and its decoration, laboratories for instruction in the management of laundries as they exist in institutions, a model apartment for teaching purposes—these details of equipment give some idea of the comprehensive plans for the school.

The courses of instruction provide preparation for the teachers of the household arts in schools and colleges, and as well technical instruction for women who wish to manage domestic households or to become administrators of larger institutional households, as college dormitories, asylums, and hospitals. There are also comprehensive certificate courses for the dietician, or woman responsible for the commissary department of such institutions, and in interior decorations, a promising profession for women of artistic gifts. Other courses provide training in dressmaking and millinery, cookery, the care of infants and small children, costume design, house planning, and in other specific practical fields. It is in these technical divisions that woman's education promises a most significant development in the next few years.

### Chemical Disinfectants.

A German investigator finds that the humic acid of acid soils checks the growth of bacteria. This result was obtained by comparing the effects of fresh peat mold and peat which had been freed of acid by leaching. The soil of moors produced similar results. The bactericidal properties of the metallic salts sodium chloride, calcium chloride, and copper sulphate, and the carbon compounds ether, benzine, carbon tetrachloride, and toluol were also studied. Sodium chloride added to urine in the proportion of 2 per cent had no effect on the bacteria, but their growth was arrested by ⅛ per cent of copper sulphate and by a mere trace of calcium chloride, while ¼ per cent of calcium chloride produced complete sterilization. Of the carbon compounds tested toluol alone exhibited antiseptic properties, while ether stimulated the growth of bacteria. The effect of metallic salts and peat mold in conjunction was also investigated. The addition of peat mold to a soil containing sodium chloride diminished the growth of bacteria. The germicidal action of calcium chloride is accelerated by the addition of peat mold, because the humic acid combines with the calcium and the chlorine is set free.

### Soap and Other Detergents of Antiquity.

BY O. BECHSTEIN.

The Greeks, Romans, Egyptians, Babylonians, and other ancient nations of high culture form only apparent exceptions to the rule that the civilization of a people is proportional to its consumption of soap, for, although these nations used little soap in the strict sense of the word, they employed several other substances of similar properties.

Two of these cleansing agents are mentioned in the Bible: "borith" in Jeremiah ii, 22, and Malachi iii, 2, and "nether" in the same passage of Jeremiah and in several of the Proverbs of Solomon. In the English Bible these Hebrew words are translated by "soap" and "niter."

Borith was an alkali obtained from the ashes of plants, in other words, crude potash. The nether of the Bible was probably the native sodium carbonate, or natron, the nitrum of the Romans, which is found in Egypt, around the Caspian Sea, and in other desert regions and which is still collected for laundry use in Egypt. "Alkali," the Arabian equivalent of nether, appears also to have been impure soda for, although it was obtained from the ashes of a plant, this plant was probably the samphire or saltwort (*Salicornia*) which, like many other seashore plants, contains soda but not potash.

The ancients also used as a cleansing agent the mucilaginous sap of certain plants, probably species of soapwort (*Saponaria*).

Another ancient detergent was putrid urine, which owes its cleansing properties to the ammonia which it contains. At the commencement of the Christian era the Roman laundrymen (*fullones*) possessed the privilege of maintaining public urinals in the streets, and, two centuries later, their business was so lucrative that it was subjected to a special tax. In Roman laundries the garments were first washed with lye and then laid in shallow earthen vessels, sprinkled with urine and trodden with the feet. They were afterward rinsed in water and exposed to the air to remove the odor of urine. The laundries were so offensive that they were placed outside of the city or in outlying quarters. Putrid urine is still used in washing in many parts of the world.

Soap made by combining grease and alkali appears to have been first mentioned by Pliny in the first century. It is described, not as a detergent, but as a pomade employed by the Gauls to give the hair a fine gloss and a reddish tint. Both hard and soft soap were made from goat's fat and beech ashes. The soap must also have contained coloring matter, but this is not mentioned. The Romans adopted from the Gauls the use of soap, and employed it extensively on the hair. Pliny says that the Gauls invented soap, but it is more probable that they adopted it from the Germans, who, in turn, may have obtained the knowledge of it from the Levant.

The use of soap in washing is first mentioned, in the second century, by Galen, who adds, however, that the Romans used various earths in washing the face. Probably soap remained an article of luxury, employed as a cosmetic and occasionally as a medicine, during the second and third centuries, while the older cleansing agents were generally used in the laundry and toilet. It is even doubtful whether the *saponarii* of the fourth century were soapmakers, or manufacturers of cosmetics in general. In Germany the use of soap has been traced back to the reign of Charlemagne, about 800 A. D., but soapmaking was at first a household art, not a trade. Until later in the Middle Ages soap was used only for washing the person and the finest articles of clothing, while ordinary garments were washed with lye made by pouring hot water on a bag filled with wood ashes.—Translated from Prometheus.

### The Legal Status of the Snail in France.

The French Minister of Agriculture, after a careful examination of the subject, has established "the legal status of the snail" by issuing a circular in which snails are defined as animals injurious to vegetation, and therefore legally subject to capture and destruction at all times and seasons. This decision has created excitement and dismay among the numerous persons who earn a livelihood by collecting snails for market. Snails are in high favor with French epicures, and immense numbers of these mollusks are eaten in Paris. In the winter of 1900 the consumption of snails in the French capital amounted to 800 tons. The consumption has since diminished, but more than 80 million snails are still received annually by the Halles Centrales, the great market of Paris.