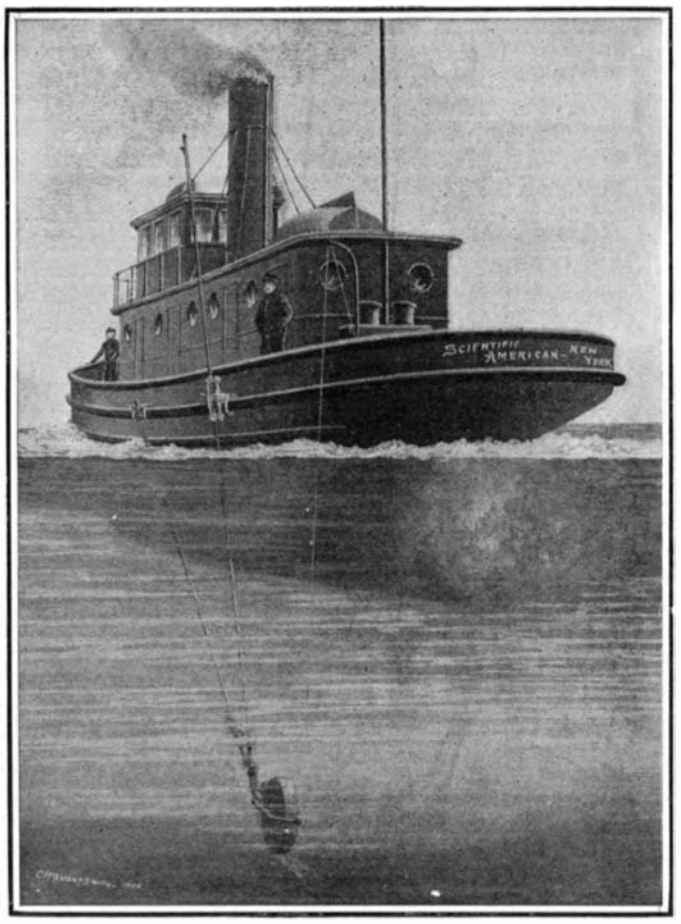
A NOVEL PROFILE TRACER.

The surveying and charting of our navigable waterways and our coasts cannot be performed with too much accuracy or care. Marine disasters within the limits of surveyed areas are often attributed to uncharted dangers within these areas, shoals, or ledges, for instance, which have escaped detection through the weaknesses or inadequacy of the devices now used in charting the waters of coast and harbor. Hydrographic surveying consists of two operations, the measurement of the depth of the water at a certain point and the determination of the location of that point. The latter operation can be performed with absolute accuracy and to any degree of precision necessary with the present means at the command of the surveyor; but the former, the determination of the depth, is rarely absolute in its results. In addition to the inherent defects of leadline or rod, there is the uncertainty due to an insufficiency of the soundings to develop fully the relief of the bottom, for the cost and labor of the requisite number are often prohibitive.

A continuous sounding apparatus, illustrated in the accompanying engravings, has recently been designed by Mr. Swepson Earle, of Washington, and has been protected by patents in the United States, Great Britain, France, and Germany. The inventor has had varied experience in hydrographic surveying, and is familiar with all its requirements. The machine is simple in character, said to be efficient in operation, and has been favorably received by hydrographers both in this country and abroad. By means of this apparatus the relief of the bottom is obtained, not merely by the determination of a series of depth measurements necessarily a certain distance apart, but by the accurate and continuous registration of the outline or contour of the bottom. In addition to its use in general surveys of harbors, channels, anchorages, and all dredged areas, it should prove of value to pilots in connection with a guide launch or tug entering or leaving harbors in advance of the vessels of deeper draft.

The apparatus is decidedly simple in construction and operation. A long, inclined rod, attached by means of a swivel connection to the side of the vessel, forward, extends downward and aft to a wheel in contact with and rolling upon the bottom. Another rod extends upward from the wheel to the rail at the quarter, passing through a guide bracket pivotally secured to the side of the boat at the rail. The latter rod is graduated to show the depth of the water when the wheel rests upon the bottom. When not in use the apparatus can be raised by means of a rope attached to the axle of the contact wheel, and carried in a position substantially parallel with the side of the vessel. An automatic bell signal, operated by two projections on the wheel which actuate a connecting arm to the bell, gives audible evidence that the contacting member is rolling properly upon the bottom of the waterway. An automatic recording device, registering the outline of the bottom upon a moving roll of paper, is part of the complete machine, though not at all necessary to its successful operation, for the depth at any instant is easily read directly from the graduated rod as the vessel traverses the surface of the river or harbor under investigation.



A NOVEL PROFILE TRACER.

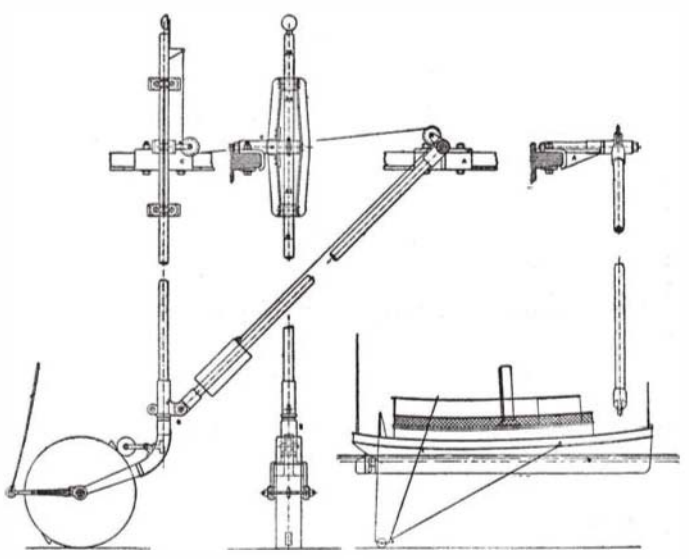
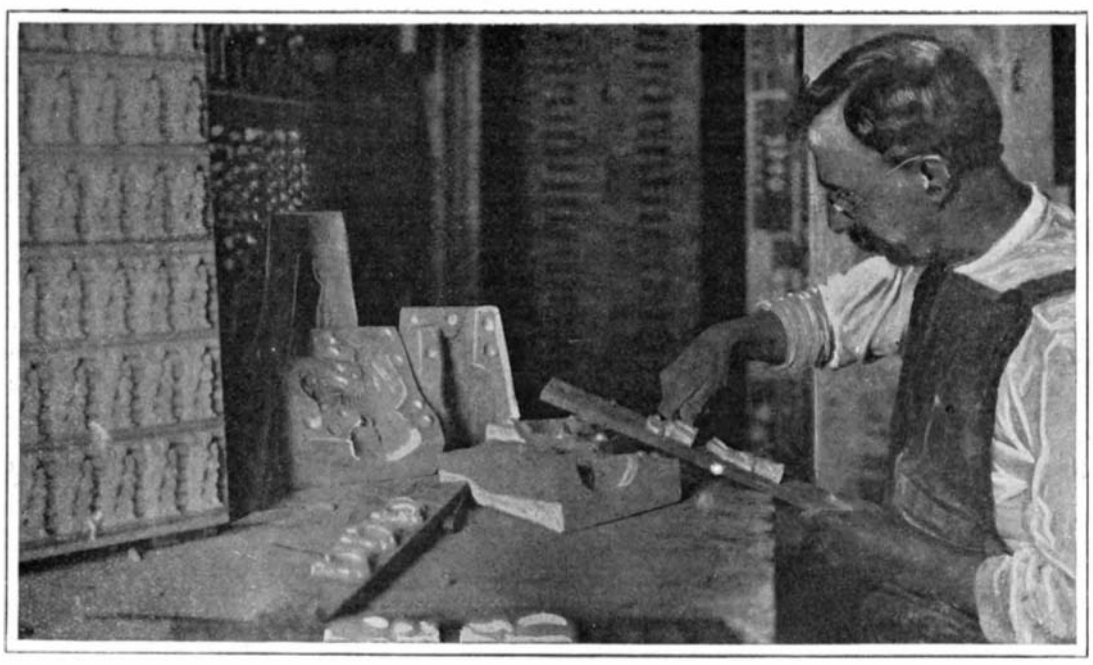


DIAGRAM OF PROFILE TRACER.

HOW EASTER EGGS ARE MADE BY THE THOUSAND.

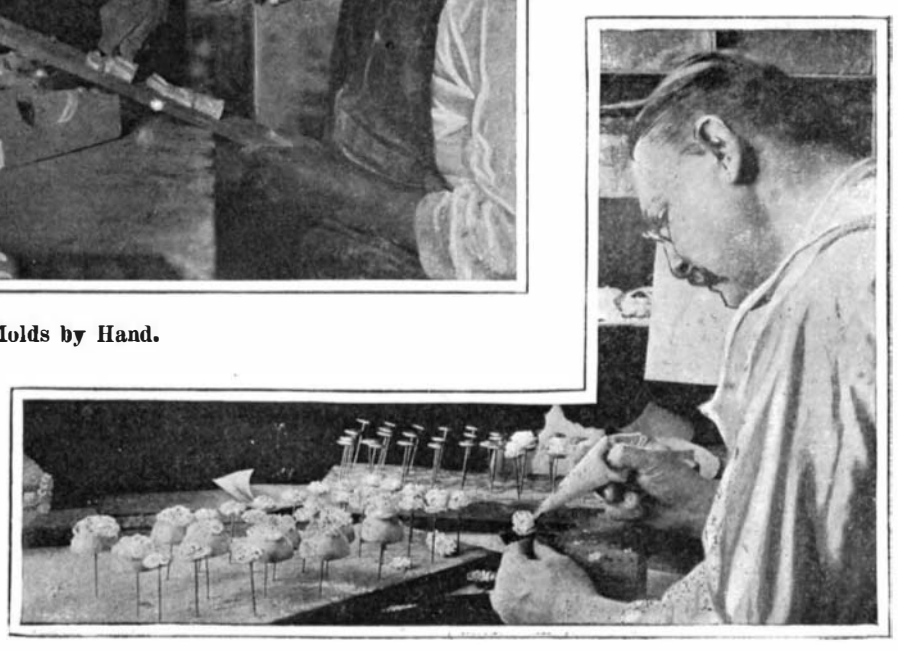
A remarkable development of modern manufacturing activity is found in the numerous industries, some of astonishing magnitude, which have sprung from popular customs, often national, though more frequently religious—practices which, while almost universal in scope, were nevertheless formerly largely individual or personal in character. Thus to-day we have in the manufacture of valentines or of Christmas tree ornaments industries producing countless novelties, involving the expenditure of millions of dollars, and, notwithstanding the numerous forms of ingenious labor-saving machinery which their growth has developed, necessitating the employment of thousands of workers. To a large extent this is also true of the manufacture of Easter eggs and Easter novelties, an extensive industry partly embraced within the field of the confectioner, and which is illustrated in the accompanying engravings. It is not possible to describe in this limited sketch the methods of making the manifold Easter toys, such as the plaster rabbit, beloved of the youth of the land, or the ocher-colored chick, with its wobbly wire legs, and consequently we shall deal exclusively with the more or less edible—at any rate they are eaten—confectionery novelties.

The major portion of those of marshmallow or other similar material is made in molds. The millions of little speckled and glossy eggs which each Easter reappear to the delight of the children, and it is to be feared, subsequently, that of the medical profession, are nothing more than somewhat glorified "jellybeans," a confection popular for the past twenty years. Molds for these eggs are made of plaster of Paris, and are placed in regular rows on printing boards to make impressions in powdered starch. A flat wooden form or open tray is filled with the starch, and placed in a machine underneath a heavy metal frame provided with a large number of these plaster of Paris molds. This frame descends upon the starch, is struck a few blows by a small trip-hammer, which is a part of the mechanism, and then rises, leaving in the starch a corresponding number of impressions from the molds. The tray is now inserted in another machine, which automatically drops into each depression the requisite amount of the jelly, and then the mold is set aside to allow this to harden. No upper mold is necessary for the small eggs, as in the cooling the upper portions contract and round off sufficiently to approximate an ovoid in form. The eggs are coated in great open revolving drums, into which from time to time melted or powdered sugar is poured, and where, as they are tumbled about, each gathers an even outside layer of smooth and glistening or crystalline character. The speckles of red, blue, or other colors are supplied in a simple manner. The eggs by the hundred are



Carving Plaster Molds by Hand.

Finishing Panorama Sugar Eggs.



Forming Flowers of Icing to be Used for Decorating Eggs.

HOW EASTER EGGS ARE MADE BY THE THOUSAND.

spread upon tables, a stiff brush is dipped in the coloring liquid, and the latter is spattered upon the eggs by simply drawing the bristles back and then releasing them to spring into a normal position.

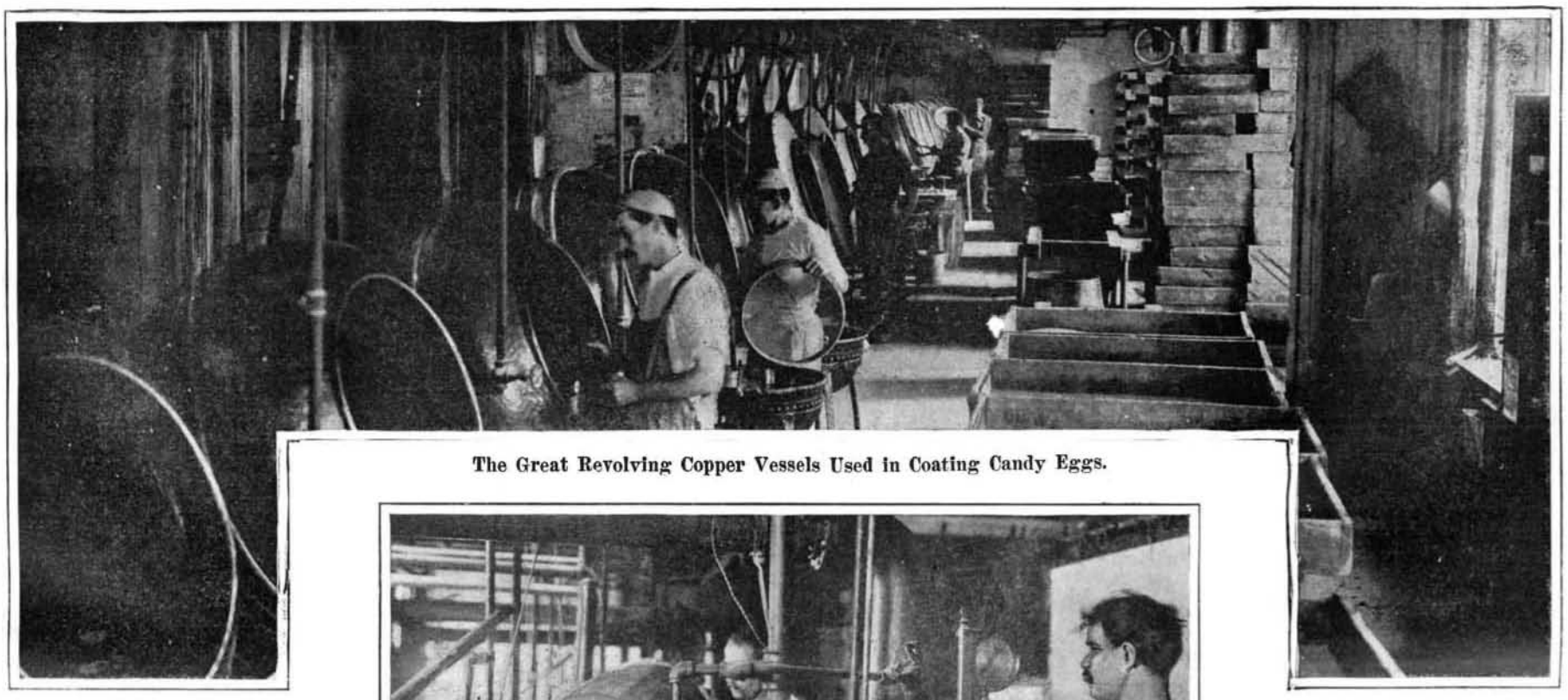
The plaster forms for the machine which impresses the molds into the starch are usually cut by hand, though more complicated ones may be cast in other molds. For the larger eggs or for more ambitious figures the molds are of course double, and are filled by hand by workmen who draw the material, usually marshmallow paste, from great stirring vessels into funnels. In each funnel is a rod, one end of which enters the spout and acts as a stopper until the workman raises it and allows a quantity sufficient to fill one of the molds to run out. The halves are allowed to harden, and are then cemented together by means of a sugar icing. The larger eggs are coated in the same manner as the smaller ones, while the figures, such as rabbits or chickens, are colored by hand.

are manufactured in an interesting manner. A plaster mold is used which has in the bottom an indentation, semi-ovoid in shape and of the size of half the egg to be formed. The mold is filled with a sugar solution, which when allowed to stand at the proper temperature, soon begins to form the beautiful crystals found in rock candy, on the sides of the mold and across the top. When the proper time has elapsed the crystal form is punctured, the remaining liquid drained off, and the sides and top broken away, leaving only the ovoid indentation, which becomes half the egg. This process is necessary, it will be understood, as the crystals are formed inwardly, and the outside of the form against the side of the mold is merely smooth and white. The edges of the semi-ovoid are then evened preparatory to joining two such halves by means of a sugar cement. Prior to this, however, the highly-colored and lithographed bits of paper, or other material constituting the scene in the interior of the

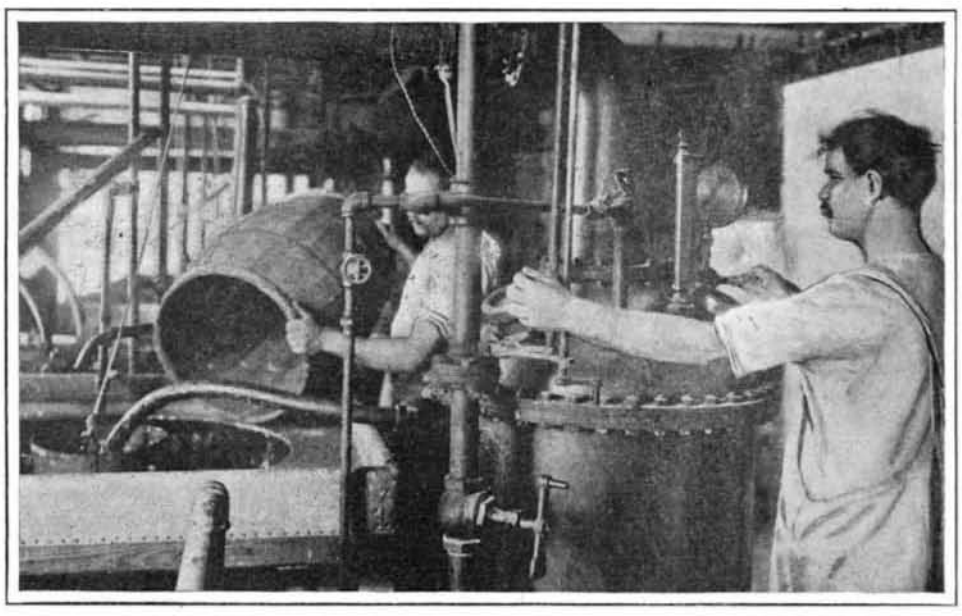
applied by means of small parchment paper cornucopias with a pointed metal spout, and the dexterity and rapidity with which the complicated designs grow under the hands of the worker who uses nothing but this simple instrument, are remarkable. It almost appears as if the completed decoration were simply flowing from the nozzle, so quickly does the picture near completion. As shown in one of the photographs herewith, even the most delicate flowers, built upon separate standards and later transformed to the object which they are intended to grace, are formed in this manner, and it is easy to understand that for work of such character a steady hand, a clear perception of design and proportion, and years of experience are requisite.

The Sense of Smell in Snails.

Emil Jung, a professor in the University of Geneva, after diligent investigation and study, announces that



The Great Revolving Copper Vessels Used in Coating Candy Eggs.



A Steam Cooker Used in Preparing the Candy.

Decorating Chocolate Eggs With Designs in Icing.

Finishing Small Marshmallow Chicks and Rabbits.

HOW EASTER EGGS ARE MADE BY THE THOUSAND

The solid chocolate eggs and figures are molded or pressed in metal forms. The hollow decorated eggs are formed by hand in heavy tin molds. The semi-plastic chocolate is placed on a table, and worked by means of a kind of paddle until it is of the proper temperature, when it is plastered by hand into the half mold, pared off across the edges of the form with a knife, and then allowed to harden for three or four hours, when it is easily squeezed out of the mold and is ready to be cemented to the other half to form the complete egg. No little skill and practice are requisite to enable the worker to line the sides of the mold with a layer of chocolate of just the right thickness and consistency, and upon these the success of the operation, to a large extent, depends.

The beautiful white crystalline sugar eggs, which have a little glass peephole at the point, and a gorgeous and highly-colored scene or panorama on the inside, egg, are placed in the lower half and cemented therein by means of a sugar icing. After the halves are joined, the bit of glass inserted in the peephole, and a paper or other band placed upon the joint running around the egg, the latter is ready to be decorated on the outside.

The decoration of these chocolate and sugar eggs is very largely a question of the skill of the workman, for the method itself is comparatively a simple one. The implement is a cornucopia provided with a nozzle through which the decorative substance, sugar paste, icing, etc., contained in the bag, may be pressed and applied to the object to be embellished. For certain classes of work these cornucopias are of rubber cloth, large in size and provided with a variety of nozzles which have openings of different kinds and number. The greater part of the delicate scrolls, figures, and flowers with which the eggs are decorated, is however

snails perceive the odor of many substances, but only when not far away.

In order to prove this interesting fact it is necessary merely to dip a glass rod in a strongly smelling substance, as for instance the essence of chamomile, and bring it near the large tentacles of a snail in motion. If it is put close to these horns, the tentacles are violently drawn back. As the animal perceives the odor, it changes its course. Snails also smell by means of their skin. Contact is not necessary, for the mere vicinity of a perfume causes an indentation of the skin. Jung has endeavored to ascertain at what distances snails perceive odors. He has put various articles of food, such as cheese, potatoes, cabbages, etc., at varying distances from twelve snails, and has discovered that they perceive the odor of most foods at a distance of about three centimeters, but that of melons at an exceptional distance, namely, half a yard away