

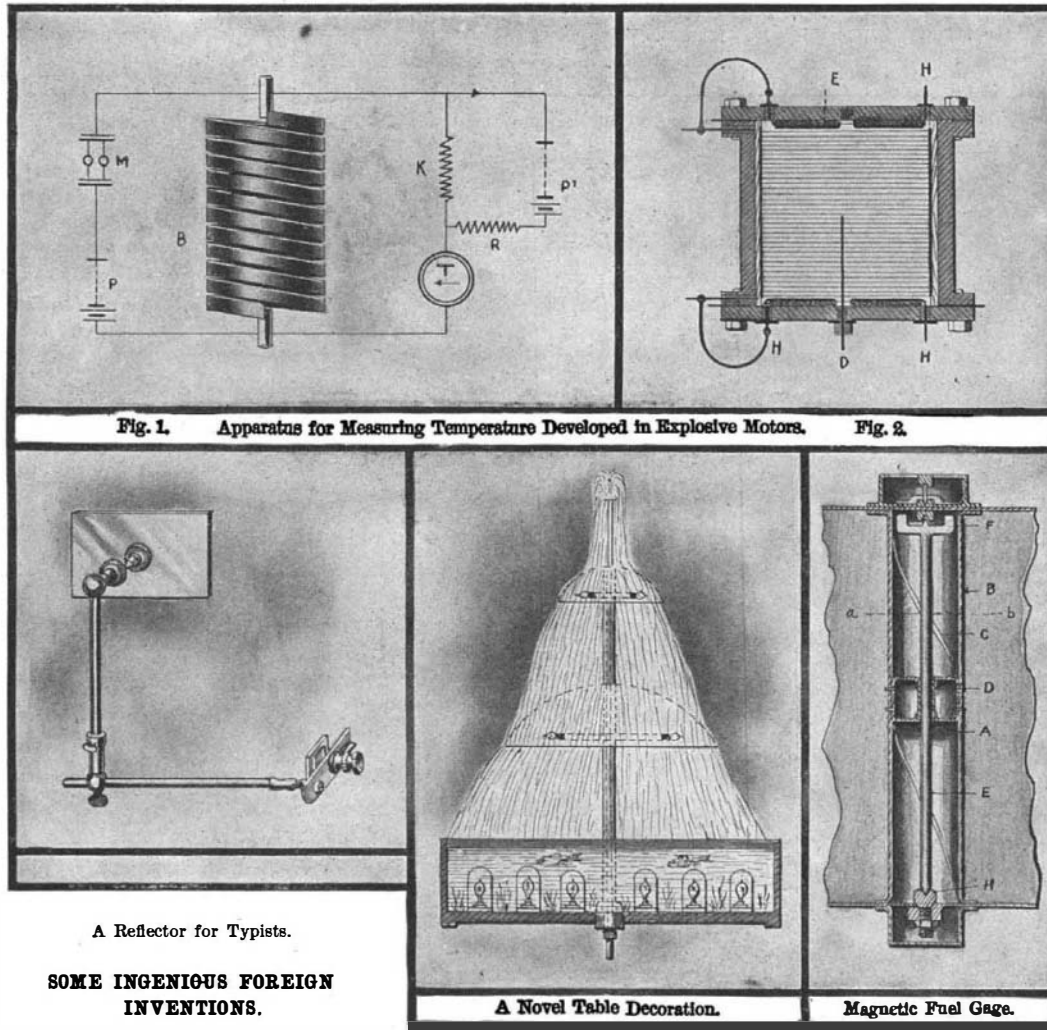
A NEW TYPE OF CLAM-SHELL BUCKET.

Pictured in the accompanying engraving is a new type of clam-shell bucket that has been installed on the Cleveland & Pittsburg ore docks in the old river bed, Cleveland. The bucket has the enormously wide opening of 18 feet 1 inch inside measurement, which is obtained without increasing the height or complexity of the structure. The advantage of this reach in scraping or cleaning up is obvious. The bucket can be operated on any design of un-loader using either steam or electricity. Its parts are few and durable and its cost of maintenance is low. The bucket shown in the illustrations has been in operation for over a month, requiring no further attention than lubrication.

Especially advantageous is this bucket in discharging the cargo from a 24-foot center boat with hatch openings running 12 feet fore and aft. It practically eliminates shoveling by hand. Another advantage, appreciated by operators, is in the position of the trays when the grab is open, as the digging edge of the trays comes in contact with the bulkhead or wing of the boat only, while the top of the trays is over 18 inches from either bulkhead, wing or stanch, thus taking the ore perfectly clean from any part of the vessel. When the grab is dropped the entire lower edge of the trays comes in contact with the tank top, obviating any damage to the tank top, which feature is greatly appreciated by vessel owners. The bucket will heel and reach to its full opening by simply placing the heavy scoop on only a half bucket of ore. Operators will appreciate the advantage of this in unloading ore from an adjoining hatch. For instance the operator by leaving some ore in the center of his hatch may lower the grab to the hold of the boat in the closed position and by placing either tray against the ore in the center of the hatch and opening the grab from this point will obtain a reach of 18 feet in either direction. Thus, if one rig should get out of order the two adjoining rigs could unload nearly all the ore from the 24-foot center boat without shifting either the rigs or the boat. The bucket is the invention of Mr. Huntsbery, of Cleveland, Ohio.

SOME INGENIOUS FOREIGN INVENTIONS.

There are European pioneers in many lines of invention who have always been successful in fashioning minor matters which make for usefulness or comfort. Several ingenious notions—as they might almost be termed—are illustrated in *La Nature*, from whose pages we abstract these descriptions.



SOME INGENIOUS FOREIGN INVENTIONS.

It is very difficult, in fact almost impossible, to determine the quantity of heat that escapes through the walls of the cylinders of explosion motors, as the calculations are based upon data (including the temperature produced by the explosion) which are yet very imperfectly known.

Prof. Hopkinson, of Cambridge University, who has devoted much attention to the theory of explosion motors, has invented a device by which this temperature can be measured directly. The apparatus is based upon the increase of the electrical resistance of copper with increase of temperature. It is a hollow vertical cylinder of cast iron, 12 inches in height and diameter. The interior is lined with wood and the

top and bottom are covered with cork. The cylinder contains a ribbon of sheet copper, 1/4 inch wide, wound in the form of a helix, with an air space 1/25 inch between the successive turns. The top and bottom of the cylinder are perforated in several places. The central hole in the bottom (D, Fig. 2) serves for the introduction of a candle of such length that the wick is at the center of the cylinder. Directly over the candle, in the center of the top, is an opening, E, by which the interior of the cylinder is put in communication with a self-registering pressure gage. The remaining apertures, HHH, serve for the introduction of strips of copper which are arranged in spirals on the top and bottom of the cylinder and which form one circuit with the

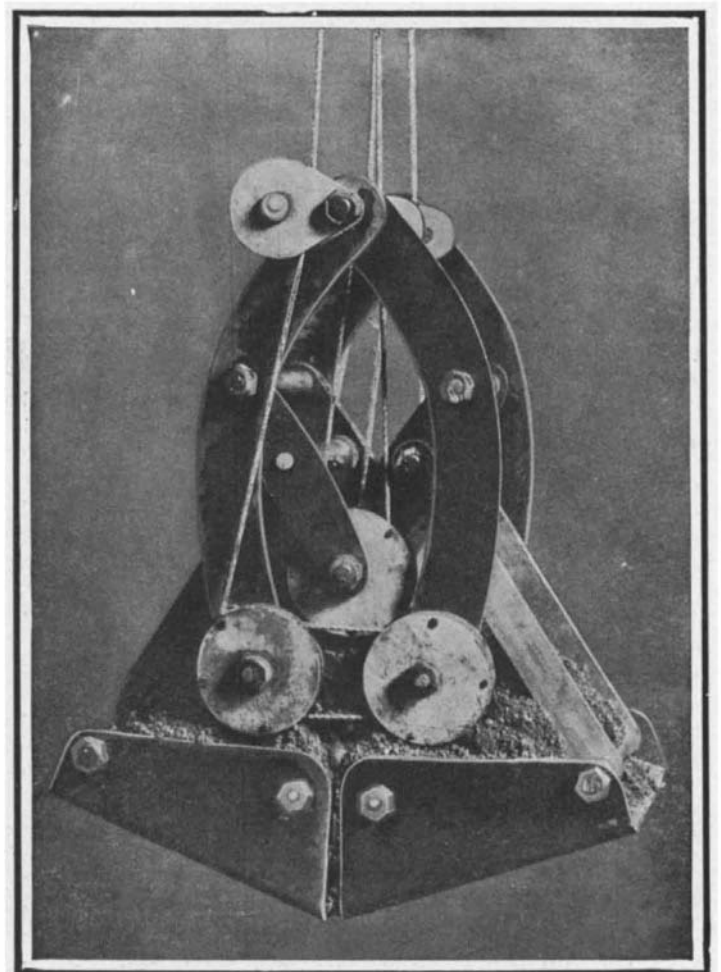
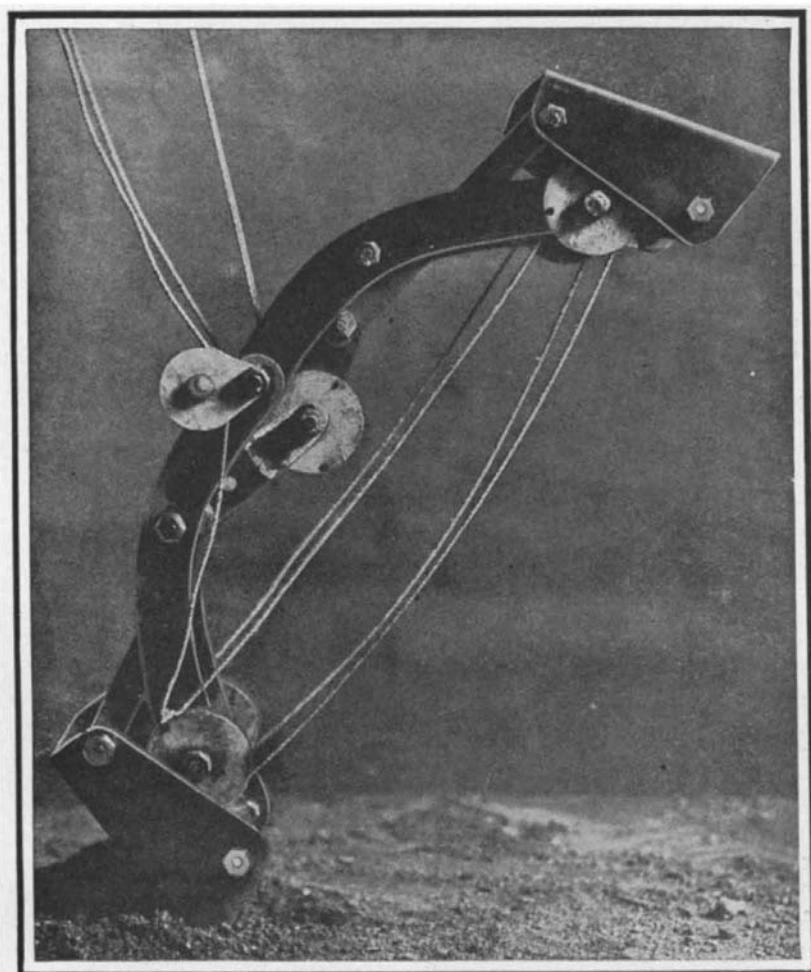
central helix. In short, the apparatus constitutes an explosion chamber lined with strips of copper, through which a current can be passed before and during the explosions to furnish data for computing the rise in temperature from the change in resistance.

The cylinder having been filled with an explosive gaseous mixture and this ignited, the change in resistance is measured by means of the apparatus indicated in Fig. 1. The principal circuit comprises the cylinder coil B, a battery of fifty accumulators P and a group of lamps M. Connected as a shunt to the cylinder coil is a second circuit which includes a galvanometer T and a resistance of 1/4 ohm K.

Finally, a third circuit, forming a shunt to the resistance K, includes a battery of six accumulators P' and a resistance R. This resistance and the lamp bank are so adjusted that a current of 8 amperes flows through the lamps and no current flows through the galvanometer T. The mixture is then exploded. The small increase of the resistance of the cylinder coil causes a proportionate increase in the difference of potential of its poles and a current through the galvanometer proportional to both of these changes. Hence the temperature produced by the explosion can be determined. The deflections of the galvanometer are recorded by a period of light which is reflected to a sheet of photographic paper by a mirror attached to the galvanometer needle. The pressure at each instant of the explosion is given by the pressure gage.

"Visible writing" typewriters are true to their name only when the light is good and they are advantageously placed with regard to it. In a room lighted by windows on one side only it is often difficult to read the writing on a cloudy day unless the machine faces, or nearly faces, the window, an arrangement which is not always convenient.

This defect is easily remedied by the "Philos," which is simply a small mirror, mounted on a jointed rod, which can be turned so as to reflect the light to the point where the key strikes the paper. The device is made in forms adapted to machines of various makes.



View Showing Enormous Opening of the Bucket, viz., 18 Feet 1 Inch.

The Improved Clam-Shell Bucket in Its Closed Position.

A NEW TYPE OF CLAM-SHELL BUCKET.