

lations of the clock and its pendulum suspension are completed.

During the evening of the pendulum the addition or subtraction of mercury from the jar should be effected by a dipping tube. The most convenient form of this latter tool is a piece of glass tube, half an inch in diameter, drawn out at one end for a couple of inches to a nose about two inches long, and about a quarter of an inch in diameter. The top end of the dipper should also be drawn out a little, and the end of the drawn out part rounded where the orifice is about one-tenth of an inch in diameter. The plane in which the pendulum swings should be east and west, and the suspension should always be of such a form as will enable the pendulum by its own weight bringing the suspension of itself from all restraint of friction.

The fulfilment of the foregoing conditions will give in all cases good practical results.—*English Horological Journal*.

AMBIGUOUS ORDERS.

You can do a great service to your subscribers by occasionally calling attention to the subject of this communication. One of the vexatious things connected with our business is the annoyance caused by want of definiteness in giving orders for goods and materials, occasioned in part by deficiency of standard gauges, and by not giving measurements by such gauges as are in use, and often for lack of consideration. Particularly does this happen when the persons ordering are not familiar with the technic of the business. Many have taken up the occupation of watchmaker and jeweler without having been "brought up to it," consequently they have only a general knowledge of it and cannot know the technical name for everything pertaining to it. Such persons are liable to order from a material dealer "a little spindle that the tick wheel plays onto," and he might receive in answer to such an order either a cylinder, verge, or duplex balance staff. An order for "two dozen mainsprings, assorted," is definite enough, but yet has a vagueness that is puzzling to the dealer; for two dozen would only contain about one of each width, with no assortment for strength. How, then, can we fill such an uncertain order? Only by guessing at the wishes of the customer by what is known of him and his business.

Orders ambiguous and absurd are of

daily occurrence, such as "a few glass to fit open-faced nickel watches," "hands for an American stem-winder," "a dozen hole jewels, assorted;" "send a hairspring for a very small cylinder watch," "a mainspring for an old-fashioned verge watch," "a dozen glass to fit a five-ounce case," "a winding wheel for an Elgin watch." These and kindred absurd orders are made doubly annoying by the fact that the jobber is expected to know exactly what the customer wishes, and if the order is filled by an article he does not wish, the blame is attributed, not to ambiguity in the order, but to the stupidity of the seller, and an angry answer is often returned with the undesired article, and possibly a transfer of patronage to a rival establishment.

The thoroughly educated mechanic will probably ask why such ignorant pretenders are permitted to call themselves watchmakers, and why they are allowed in the ranks of legitimate tradesmen who have spent years in learning their art. We don't know; we only know there are thousands of naturally good, honest, ingenious men who are groping about in the dark, trying to follow a path in life that would have been all sunshine and success if they could have been started on it properly in the beginning—who, even in the dim light in which they labor, do more honest, honorable work than some others who, with the advantages of tools and competent instruction, make their trade and its mysteries a cloak to cover all sorts of petty cheats and swindles. How to give encouragement and instruction to the former class, and to suppress and eliminate the latter, are as yet two unsolved problems. That both are felt to be important questions for solution is obvious from the fact that so many are suggesting remedies, getting up organizations, societies and unions for protection of the good and suppression of the bad craftsmen. The outcome of these endeavors is veiled in the hereafter. Possibly the earnest search for the right path out of this labyrinth may ultimately succeed.

Ignorance is not the cause of all ambiguous orders. One of our best workmen lately sent in for a ten-leaf pinion of a particular size by the wire gauge. It was sent, and returned with the message that he wanted a cannon pinion, that came back with an order for a ten-leaf hollow centre pinion, which was really the one required. This was simply

carelessness. Another sent a written order for a P. S. B. hole jewel for balance wheel. The workman himself returned the jewel, and petulantly asked why we did not send what he ordered. We said the order had been filled as well as its obscurity would allow. He replied there was no obscurity about the order. The explanation that there was an upper and lower hole silenced him but did not please him; he selected a cock hole, but how were we to know which he wished.—*R. C. in the Jewelers' Journal*.

JOHN HARRISON.

THE FATHER OF ALL CHRONOMETER MAKERS.

The following account of John Harrison and his works was recently published in an English paper:

John Harrison was born at Foulby, near Pontefract, Yorkshire, in the year 1693, his father, Henry Harrison, being a carpenter at that place, who was married in the month of July, 1692, at the parish church of Wragby, to Elizabeth Barber, of the same parish, where their eldest son John was baptized, it is said, on March 31st, in the following year. The father was in the habit of repairing clocks, and as much of the mechanism of the larger clocks was, in those days, frequently made of wood, the carpenter was very often called upon to repair them. It is said that during an attack of small-pox, from which young Harrison suffered at the age of six years, a clock on his pillow was the only thing that would keep him quiet. In the year 1700 his parents removed to Barrow, in Lincolnshire. Here he attracted the attention of a clergyman, who lent him a MS. copy of the lectures of Nicholas Saunderson, the blind Lucasian professor of mathematics at Cambridge, which he copied with all its diagrams. His early devotion to mechanical pursuits led him to give his attention to the improvement of clocks, and in 1726 he had constructed two, chiefly of wood, in which he applied the escapement and compound, or, as it is called, gridiron pendulum, of his own invention. In 1718 an Act of Parliament, 12 Anne, cap. 15, was passed, the preamble of which recites as follows: "Whereas, it is well known by all that are acquainted with the art of navigation, that nothing is so much wanted and desired at sea as the discovery of the longitude for the safety and quickness of voyage, the preservation of ships, and the lives of men; and where.