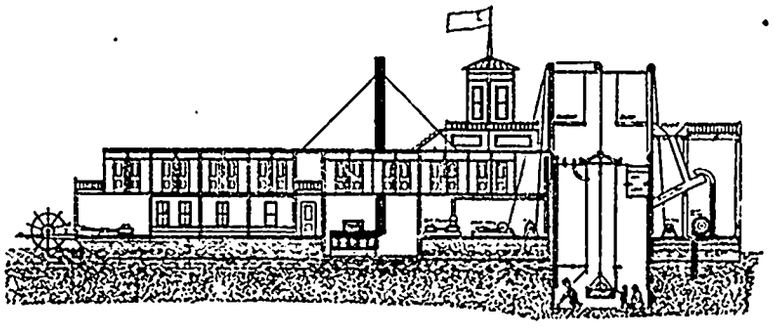
A NEW GOLD DREDGE.

A number of tests have been made at Vancouver, B. C., recently, of the model of the pneumatic caisson and air lock elevator, invented by Garrison & Wood, and which has been built by them for test purposes there. In every case the tests have proved the invention to be most valuable for the recovering of gold from the bars and beds of rivers and creeks. The model of the caisson and elevator are built into a scow for temporary purposes, but the permanent machine is to be placed



THE CAISSON ELEVATOR IN OPERATION, SHOWING MEN AT WORK IN BED OF RIVER.

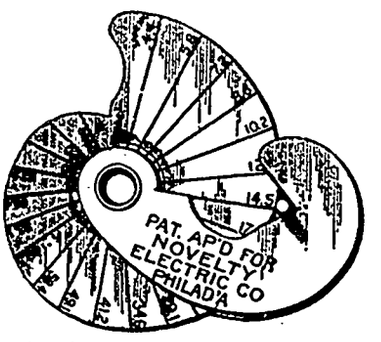
on a sternwheel steamer. The model itself has a caisson 5 feet by 8 feet, but the complete machine will be built of steel, and the caisson will be 10 feet by 20 feet, so as to allow six men to be at work at one time. Entrance to the upper air-closed chamber is obtained through an opening in the top, and when the workmen are all in, the opening is sealed up and the clamps over the opening to the lower chamber are removed, and the bed of the river is reached by means of a ladder. Before the workman goes on board, however, all the water will be removed from all the chambers by air pressure, which will vary from 2½ lbs. to 15 lbs. per square inch according to the depth to be reached. On reaching the river bed, clamps are removed from the elevator shaft and the workmen begin excavating, and shovel the dirt into a bucket in the elevator. When the bucket is full the elevator shaft is closed tight, a signal is given, and the shaft is opened at the top, the bucket is hauled up and its contents emptied on to the dump. It is then lowered into the shaft, which is again hermetically closed at the top, a signal is given and the fastenings below are removed, so that the whole process can commence again. C. C. Bennett, of F. C. Innes Co.'y, Ltd., Vancouver, B. C., is the agent of the invention for Canada.

REFRIGERATING MACHINES.

A correspondent of Fairplay, London, writes: As a result of the recent extensive additions J. & E. Hall, Limited, have made to their works at Dartford, Kent, which, by the way, is the third time this has been necessary during the past few years, I hear that they have been turning out refrigerafor machines on their patent carbonic anhydride system for the last four months at the rate of fifteen per month, that is to say, a total of sixty machines in four months. This is a result that they may well be proud of, as many of the machines were of large size, such as those for Houlder Bros. & Co.'s two latest ships, which have a capacity for over 2,000 and 3,000 tons weight of meat respectively; also those for the White Star Line for their S.S. Nomadic and Tauric for the carriage of chilled beef; machines for the United Steamship Company of Copenhagen for the carriage of about 900 tons of butter and bacon in each ship; and for Thos. Wilson, Sons & Co., in the same trade. The British Admiralty have had several more machines from Messrs. Hall, and the new Japanese battle ships have been fitted by them. For the carriage of fruit and preserving provisions, etc., Messrs. Hall have executed further orders for the Union Steamship Company and Donald Currie & Co. Other machines have been supplied to the Oriental Steamship Company of Japan, the Nippon Yusen Kaisha, Baron Rothschild's new twin-screw yacht, the Atmah, the Russian Volunteer Fleet, and many other vessels. They still have in hand orders for no less than 75 machines, either fitting or to be fitted on board ship, besides a large number of machines for land purposes, which comprise almost every trade for which refrigeration is required. It is interesting to note that J. and E. Hall have fitted and have on order for the largest steamship companies no less than nine installations each for two of those companies, also orders from seven other companies that run into from four to six installations apiece, and orders for ten, seventeen, eighteen, twenty-three, twenty-eight and thirty installations respectively, for other companies. A description of some of these machines will appear in another issue of The Canadian Engineer. The London office of the company is at 23 St. Swithin's Lane.

HOW TO USE THE ELECTRIC WIRE GAUGE.

Place the wire in the V-shaped opening between the movable arm and the edge of the gauge. Move the arm around until the wire is tightly bound against the edge. On the front of the gauge the figures above the short, square shoulder, near the centre, show the American (B. & S.) gauge of the wire. The figures on the outer edge of the gauge on small line, show the amperes the wire will safely carry before heating to 30 degrees above the temperature of surrounding air. On the back of gauge the ohms resistance is given of a foot of copper wire, of any size, as shown by the gauge. To find the resistance of a foot of iron wire, multiply the resistance of a foot of copper wire by seven (7). To find the resistance of a foot of German silver wire, multiply the resistance of a foot of copper wire by thirteen (13). To find the number of lamps a wire will carry: Bear in mind that a 50-volt lamp takes 1 ampere, a 75-volt lamp ¾ of an ampere, and a 110-volt lamp ½ an ampere of current. From the gauge, get the size of wire and its safe carrying capacity in amperes. The wire will carry as many lamps as the current of one lamp of a given voltage is contained in the ampere capacity of wire, as shown by gauge. Example.—The safe ampere capacity of No. 12 copper wire B. & S. Gauge is 14½ amperes, and one 110-volt lamp requires ½ ampere of current; therefore, $\frac{14\frac{1}{2}}{\frac{1}{2}} = 29$, the number of lamps a No. 12 B. & S. gauge, copper wire, will carry. To find the size of wire required to carry a given number of lamps, at a given distance, at a given loss.—Taking the formula as stamped



on arm gauge: Let V represent the volts loss, C represent the total amperes and D represent the distance in feet (both ways). Example.—Desiring the size of a feeder-wire that will carry 20 amperes at a loss of 10 volts, 400 feet (800 feet both ways); V = loss in volts, which, in this case, is 10; C = total amperes, which, in this case, is 20; D = total distance in feet, both ways, which, in this case, is 800. Therefore, $\frac{10}{20 \times 800} = \frac{10}{16{,}000}$ .000625, the resistance of one foot of copper wire. Having this result, place the square shoulder of the gauge-arm on line with the nearest resistance to said result that is found on the gauge, and the square shoulder on the reverse side will indicate the B. & S. copper wire gauge desired; in this sample case, it will be found to be No. 8 wire. For sale by Aikenhead Hardware Co., 6 Adelaide street East, Toronto.

James Stewart & Co. are at work on the foundations of the new bridge to be constructed across the Niagara River at Lewiston.

The St. John, N. B., Globe says: The building of the Cushing Sulphite Pulp Company's mill is now an assured thing, for one English paper maker has taken three-quarters of the stock and more than one-half the remainder has already been subscribed by local capitalists.