

Mfg. Co., Buffalo, N.Y., we have seen this work performed on a milling machine similar to the one mentioned above. We are informed that the Cincinnati Milling Machine Co., have fitted up machines to do this same work for H. Bollinckx, Brussels. A single hole is drilled at one corner of the rectangular into which the brasses fit, and a cutter like that shown in Fig. 3 is passed through and removes the stock at a single cut, as shown in illustration. A second cut is then taken to finish the hole to size. The rod illustrated is 40-carbon hammered machinery steel 2-in. thick, and the finished hole is 3 by 6-in. with corners $\frac{1}{2}$ -in. radius. The total time consumed in milling this rod; from the moment the first cut was started until the finishing cut was completed, was $42\frac{1}{2}$ minutes. Of course in doing this, a good bit depends on the cutter. It must be held firmly in the spindle of the machine and its outer end must be supported in the same manner as a cutter arbor is supported. The chips are also somewhat of a problem, but if a strong stream of oil is delivered to the cutter under pressure, it will keep it clear of chips. This operation brings into play both horizontal and vertical automatic feeds of the miller, and since the feed must be stopped and reversed at the corners, it calls for a machine that has all the levers conveniently located.



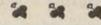
NEW CANADIAN LIGHTSHIPS.

The Polson Iron Works, Toronto, Ont., recently completed and despatched to its destination one of a pair of steel lightships, which it is under contract to build for the Dominion Government. These vessels are the first of their class built in Canada and have a large amount of free-board and are sheered very high in the bows, so as to keep dry when pitching in a heavy sea. They are in excess of Lloyd's requirements for vessels of their size, and have water-tight bulkheads, which will make them almost absolutely unsinkable.

The Lurcher No. 14, which left for its destination just before navigation closed, has a length over all of 124 ft., beam 28 ft., depth from top of keel to spar deck 21 ft. 6 in., draught, fully loaded, 11 ft. 6 in. It has two steel pole spars, on which, 50 feet above the deck, are swung three powerful

fathoms of $1\frac{1}{4}$ -in. stud link chain. The auxiliary outfit is most complete, and comprises steam windlass, capstans, pumps, electric gears, steering gear, etc.; also complete life-saving apparatus constituting it a well-equipped life station. The fittings and furnishings throughout are first-class in all respects and provide everything requisite for the comfort and convenience of the crew.

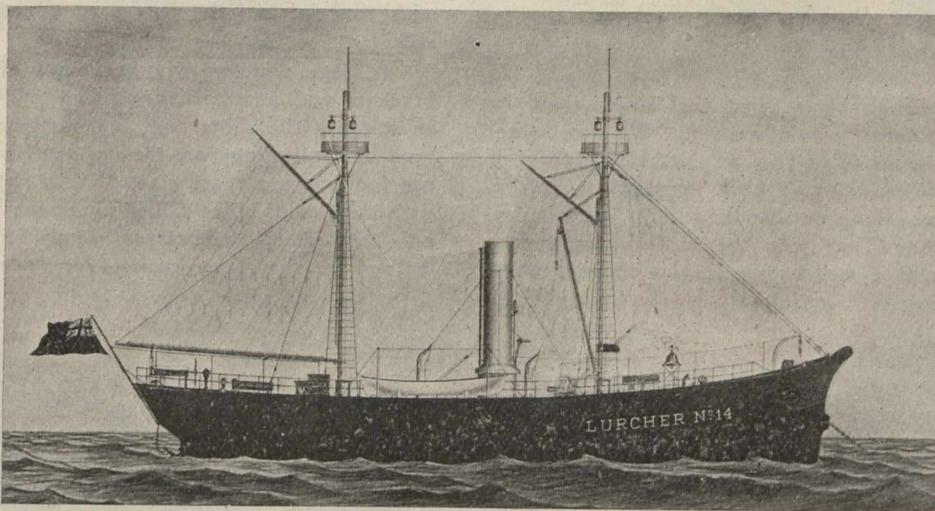
The Lurcher will be stationed at the Lurcher shoals in the Bay of Fundy, off the Nova Scotia coast. The second light-ship, which will be completed next spring, will be stationed off the island of Anticosti in the Gulf of St. Lawrence.



J. Walter Wells, formerly Provincial Assayer for Ontario, in connection with the Bureau of Mines, has been appointed Chief Assayer for the Dominion Government Assay Office, at Vancouver, B.C. Mr. Wells resigned his position with the Bureau of Mines to investigate the industrial use of low-grade iron ores in Ontario. For this work he was awarded the nomination for the scholarship of the Colonial Exhibition of 1851, at Queen's University, Kingston.



—The ventilation and heating of a theatre presents a problem not easily mastered by the ordinary heating engineer. In a crowded auditorium of this kind ventilation is the all important question. It may be a simple matter to heat the building to a required temperature before the curtain rises, but to maintain a constant temperature and a pure atmosphere while the play progresses is not so easily accomplished. The heat given off from the bodies of the closely seated audience is sufficient to raise the temperature in the house from 5 to 10 degrees during the performance. Fresh air to breathe must be supplied constantly to the occupants and the impure air must be removed. Evidently a system giving forced circulation of air is necessary to meet these requirements. A good example of this system is the recent installation in the New Franklin Square Theatre, at Worcester, Mass. The heating and ventilating apparatus consists of an electrically driven fan and heating coils, located in a corner of the basement. Fresh air is drawn



The Lurcher Lightship.

electric lamps on each spar. The gallery surrounding the lamps serves for a day mark. There is a large automatic fog bell and fog siren worked by compressed air. Fresh water tanks of 60,000 gallons' capacity contain water for drinking and to supply waste in the machinery.

The engine is of the high-pressure, surface-condensing, vertical, marine type, cylinder 23 in. diameter, with 22 in. stroke. Steam is supplied by two navy-type boilers, with a working pressure of 140 lbs. All the pipes are of copper. The vessel will be moored by three mushroom anchors, each weighing 5,000 lbs. The mooring chains are $1\frac{5}{8}$ -in. stud link, specially made and tested for this work. The ship is furnished with 240 fathoms of this chain, also with 120

from the outside and circulated through coils of steam pipes enclosed in a fireproof casing and distributed through ducts by means of the fan to the desired parts of the theatre. There are plenum chambers under the orchestra floor and first balcony from which air is admitted through openings in the chair legs giving an even distribution throughout the house. The low velocity with which the air enters prevents annoyance from draughts. The foul air is exhausted through grills in the dome of the theatre and by means of an electric exhaust fan is discharged through the roof. The B. F. Sturtevant Co., of Boston, Mass., were the heating and ventilating engineers, and the apparatus installed is of the Sturtevant manufacture.