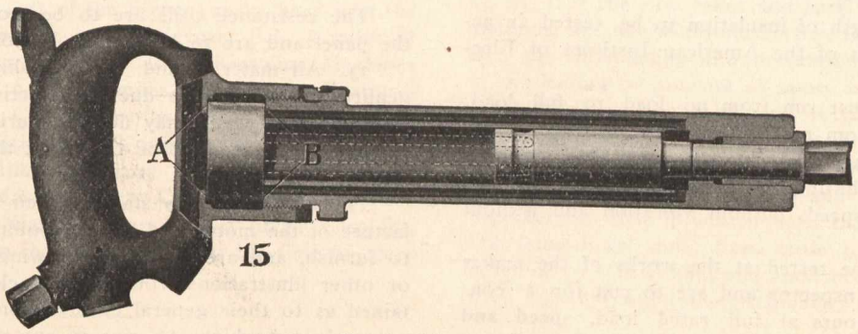
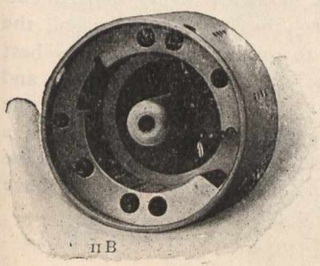
The valve is steel drop forged from selected stock, is accurately ground to gauges unchangeable and guaranteed against any breakage from service. The valve box is also made of steel throughout, with all surfaces ground. The efficiency of the pneumatic hammer is seriously impaired if the joints between the faces of the cylinder valve box and handle are not kept tight. This is made plain in the section of the Haeseler chipping hammer which accompanies this article. See A and B on the cut.

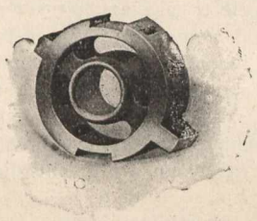


Section of Chipping Hammer.

The ingenious arrangement to secure keeping these joints tight by locking them together is a simple and yet strong construction. It consists of a number of slots in the car of the cylinder and a different number of notches in the end of the handle, one number not being a multiple of the other. This arrangement permits a fine adjustment to be made when it is desired to take up the wear of the ports, as a notch in the handle will always be in line in one of the slots of the cylinder, without regard to any required position of the handle being necessary.



Interior of Valve Box.



Axial Valve.

When the handle is screwed up tight the parts are locked together by inserting a key in the registering slot and the notch in the handle. This key is held in place by a spring band around the collar of the cylinder.

The Haeseler-Ingersoll chipping hammers are made in five standard sizes, with strokes ranging from one to five inches. The long stroke riveting hammers are in three sizes, with strokes of 6, 8, and 9 inches respectively. These tools are handled in this country by the James Cooper Manufacturing Co., of Montreal, Canada, which is the selling agent for the Ingersoll-Sergeant Drill Co.

TESTING DEPARTMENT IN ELECTRICAL FACTORIES —U. S, GOVERNMENT REQUIREMENTS.

Editor, Canadian Engineer:—

One of the most important departments connected with the manufacture of electrical apparatus is that given over to the testing of motors and dynamos. As electrical drive for machinery in all kinds of shops is coming into almost universal use, and buyers of electrical material now realize that this class of machinery can be built to conform to almost any special service, and that certain results can be obtained in the line of speed, commutation and temperature elevation, as a consequence all contracts are drawn with these facts in mind, so that it is no longer a question of designing a machine, and then driving it by any motor that can be obtained, but the motor must become a part of the machine itself, fitting into it or upon it, and built specially for that particular class of service. This means, of course, that the standard line of motors which most electrical companies keep before the trade cannot be used to so great an extent now as they could some years ago, and that the manufacturing companies have got to stand ready to supply special machines and have also got to be able to make reasonably quick deliveries. All this leads to certain elaborations in the equipment of shops for this work, in the draughting, pattern, and machine departments, and to a greater extent in the testing department. A few years ago anything in the way of a motor that would run was looked upon as good enough, or possibly it was thought that they were as good as could be produced, and customers were satisfied with them, but now these conditions have changed, and all motors have to fulfil certain specifications, and the testing department has to be used more than ever in order to ascertain if these conditions are met, as failure of the machines to meet requirements would result in their rejection. The expense and trouble of redesigning and rebuilding would have to be borne by the manufacturer, which expense may easily take off all the profits on a contract.

In this connection it may not be amiss to give a form of standard motor specification covering general details; matters of shape, size, speed, etc., etc., being given on special contracts for certain work.

Specifications for electric motors for operating United States navy yard machinery, Bureau of Construction and Repair, Navy Department:

1. Motors to be Direct Current of three types:—(a) open, (b) semi-enclosed, (c) enclosed.

(a) Open type motors may be of any desired design such that the brushes and commutator are readily accessible and all parts free to good ventilation.

(b) Semi-enclosed motors are to be of such design that all parts are completely protected from external mechanical injury, and all openings into the interior of the motor are to be covered with perforated metal or wire mesh covers arranged to secure the best possible ventilation and allow by their removal access to the commutator and brushes.

(c) Enclosed motors are to be entirely enclosed and dust-proof, but provided with removable covers to allow access to commutator and brushes. Ordinary open type motors provided with separate housings will not be accepted as enclosed motors.

2. Armatures must be of the iron-clad type and have form wound coils, easily removable for repair, except that motors of less than 7 h.p. may have hand wound armatures, if desired.

3. Commutators must be of pure hard drawn or drop forged copper. Cast segments will not be accepted. Segments to be insulated with mica of such hardness as to wear even with the copper.

4. Brushes are to be of carbon and not to carry more than 35 amperes per square inch at full load. The brush-holder springs shall not be depended upon to carry current. In motors of 5 h.p. and above, brush-holders are to be separately adjustable for tension without tools, and simultaneously adjustable for position. In motors below 5 h.p. these adjustments are not required. Brush-holders to be of such design that by very slight changes in the relative position of their parts the rotation of the armature may be in either direction with equal satisfaction; also the angle of the brush to the commutator not to change as the brush wears down.