

passing through screen *a*, the curled hair, and strainer *b* enters into the interior of the strainer. From there it passes up through passage *e* and thence through a pipe to the air inlet valves.

### COMPRESSOR TESTS

**92. Rules Governing Tests.**—According to the Federal rule, it is to be understood that if the compressors are just able to meet the prescribed tests, they have reached the limit of their usefulness and must be repaired. Therefore the rule prescribes the condemning limits of the compressors and not their passing limits. The rule follows:

"The compressor or compressors shall be tested for capacity by orifice tests as often as conditions may require, but not less frequently than once in three months.

"The diameter of orifice, speed of compressor, and the air pressure to be maintained for compressors in common use are given in the following table:

SIZE OF COMPRESSOR INCHES	SINGLE STROKES PER MINUTE	DIAMETER OF ORIFICE INCHES	AIR PRESSURE MAINTAINED POUNDS
9½	120	1¼	60
11	100	1⅜	60
8½	100	1½	60

"This table shall be used for altitudes to and including 1,000 feet. For altitudes over 1,000 feet the speed of the compressor may be increased five single strokes per minute for each 1,000 feet increase in altitude."

**93. Testing Device.**—Fig. 33 shows three views of a testing device. View (a) is a disassembled view of the disk holder, which consists of the parts *a* and *a'*, orifice disk *b*, and gasket *c*. View (b) is a sectional view of parts shown in view (a) assembled, and view (c) shows the manner in which the disk holder is connected to the main reservoir.

To assemble the parts shown in view (a), the orifice disk *b*, having an orifice of a specified size, is placed first in the nut *a'*

and the gasket *c* is then inserted, after which the two parts *a* and *a'* are screwed together. In view (b) is shown a section through the disk holder when it is assembled, and in view (c) the disk holder is shown in place, the part *a* being screwed

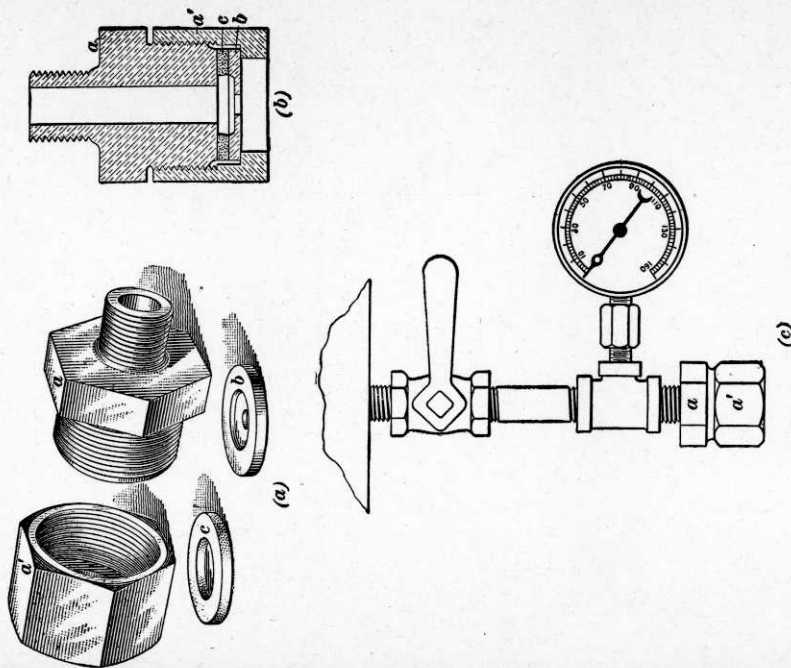


FIG. 33

into a ½-inch pipe that connects to the main-reservoir drain cock and also to an air gauge. In the pipe is also a cut-out cock, as shown.

**94. Test for Leakage.**—Before the compressor is tested, the main reservoir should be drained and it and the piping on the engine tested for leakage. Otherwise the test

would indicate a poorer condition of the compressor than is the case, due to extra labor required to maintain the leakage. The leakage test is made by closing the throttle to the compressor after obtaining the main-reservoir pressure corresponding to the governor setting. Then with the A-1 equipment, the double-heading cock should be closed, or if none is provided, the brake valve should be lapped.

With the No. 6 ET equipment, in addition to the above, the cut-out cock in the supply pipe to the distributing valve must be closed. After this is done, the main-reservoir pressure should be drained down to about 60 pounds. The gauge on the engine should then be watched, and the fall in pressure from 60 pounds noted. Leakage in excess of 2 pounds per minute should be stopped for the reason above mentioned before beginning the test.

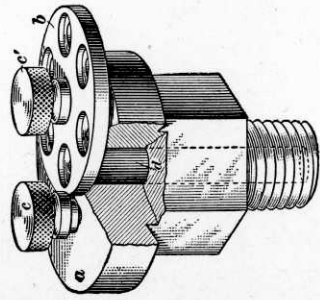


FIG. 34

**95. Making the Test.**—To make the test, the testing device assembled as shown in Fig. 33 (c) is connected to the main-reservoir drain cock. The compressor should then be started, and the cut-out cock in the testing device opened. The

steam supply to the compressor should be throttled until the main-reservoir pressure is maintained at approximately 60 pounds. The stroke of the compressor should then be noted by counting the pump exhausts, each exhaust being a stroke. If the number of strokes are in excess of 120 per minute for the 9½-inch compressor, and 100 for the 11-inch and the 8½-inch compressors, when using the size of orifice opening specified, the compressor must be repaired.

Fig. 34 shows a view of a testing device with a part broken away, which differs somewhat from the one illustrated in Fig. 33 as the orifices necessary to test different types of compressors are all contained in one disk.

The device consists of a part *a*, the middle portion of which is hexagonal in shape while the lower portion has a

¾-inch pipe thread, and a disk *b*, containing six different-sized orifices, secured to a part *a* by a thumbscrew *c'*. An opening *d* extends through part *a*. The orifice desired can be used by loosening thumbscrews *c*, *c'* sufficiently to permit disk *b* to be rotated about *c'* until the orifice of the proper size is over hole *d*, after which the thumbscrews are again screwed down tight. Disk *b* contains orifices of the prescribed size for the testing of the three types of the Westinghouse and the New York air compressors. The threaded portion of the testing device can be screwed into the main-reservoir drain cock when making the test or it can be secured to a coupling that permits of the device being connected to the brake-pipe hose instead of to the main reservoir if desired.

### OPERATING A COMPRESSOR

**96. Starting and Running the Compressor.**—When starting the compressor, the drain cocks in the steam end, if not already open, should be opened. The compressor should first be run slowly until all the condensed steam has escaped through the drain cocks, and until a main-reservoir pressure of 25 or 30 pounds has been reached. This pressure provides an air cushion for the piston, and is necessary to prevent the piston from striking the cylinder head on account of the small amount of clearance provided, which would cause pounding and loosen the air piston on the rod. When sufficient air cushion has been obtained, and all condensation has escaped, the drain cocks should be closed, and the compressor throttle opened to run the compressor at the required speed. Care must be taken not to run the compressor at an excessive rate of speed.

**97. Stopping the Compressor.**—To stop the compressor at the end of a trip, the lubricator to the steam cylinder should be closed off, then the steam valve, and all drain cocks on the compressor should be opened. The drain cock on the main reservoir should also be opened so as to allow all moisture to drain from the reservoir.