cut, whereas with a belt driven machine, such a case would result in broken gear, etc., and the machine would consequently be out of service for several days.

The cost of construction was $40. Scrap material which is now reclaimed, made possible by the use of this machine, amounts to about $25 a month, and as a labor saving device it is worth $45 a month to the car department alone.

Drills for Rod Oil Cup Holes, at Stratford Shops, Grand Trunk Railway.

A type of fluted reamer drill of the form shown in the accompanying illustration is used in drilling out the oil cup holes in the G. T. R. shops at Stratford, Ont. The holes are first drilled the size of the opening from the oil pocket into the bearing, and with this as a guide for the tip of the reamer drill, the latter is sunk into the work.

The drills are made of high speed steel, and are fitted on soft steel shanks, as the two outer drills show, the centre two showing the high speed steel section. The cutting end is given a guiding tip, and the body is fluted with either straight or spiral fluting.

Staybolt Driver at Pere Marquette Railroad Shops.

The accompanying illustration shows a staybolt driving tool as used in the Pere Marquette Rd. Shops, St. Thomas, Ont., which has the advantage of not requiring the staybolts to be squared in the head, as usually practised. The tool consists of a soft steel body, with a taper shank, bored out at the opposite end slightly larger than the staybolt diameter. In one side of the body there is a slot, ⅜ in. wide, in which is pinned a high speed steel block, ⅜ in. thick and 1 in. square, the periphery of which is milled with teeth. The turning of the tool with a staybolt inside, causes this square block to make a partial turn, gripping the round head of the staybolt.

Rubber Tensile Testing Machine on Intercolonial Railway.

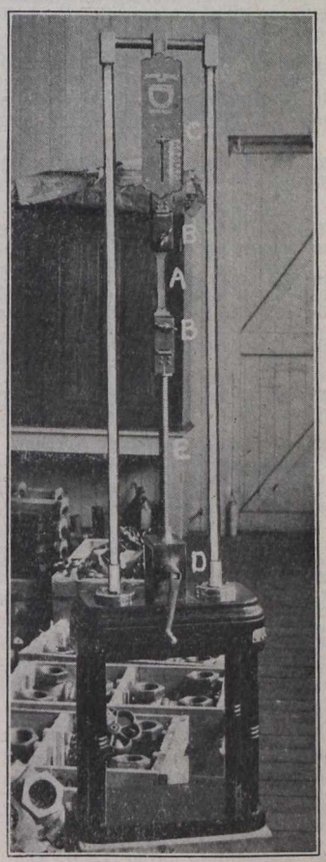
By G. E. Davidson, Assistant Test Engineer, Moncton, N. B.

The quality of water and air hose depends largely on the quality of the rubber used in its manufacture and those whose business it is to purchase such hose generally judge of its value by cutting a small piece from the rubber lining to feel its elasticity by stretching it. The better the rubber the better the hose. Good rubber stretches like a rubber paper band while the rubber used in inferior hose has so little elasticity that it can scarcely be noticed. The M. C. B. specification for air brake hose embraces this fact and it calls for a definite amount of elasticity and strength.

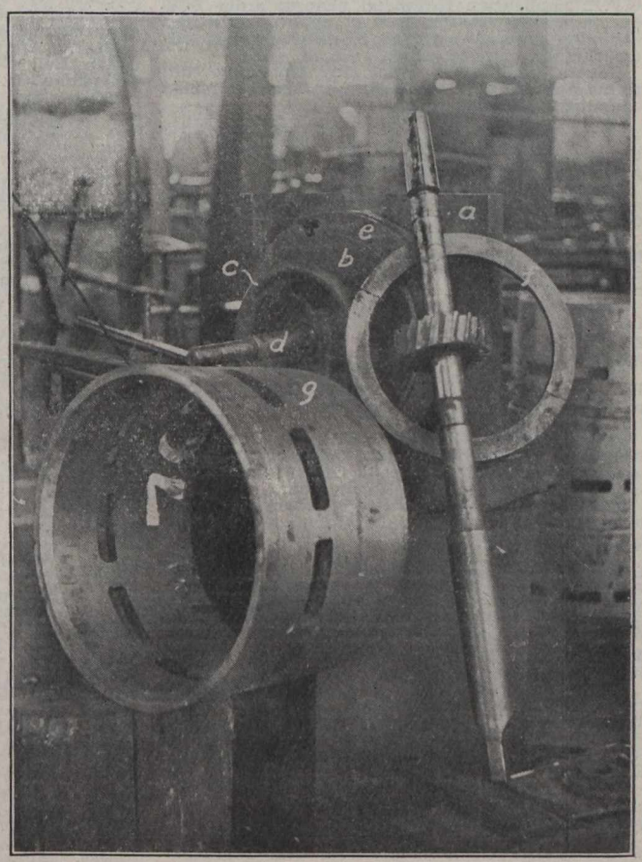
The accompanying illustration shows a machine for testing the elasticity and strength of rubber used in the formation of air brake, air signal and steam hose, in accordance with the requirements of M. C. B. A. recommended specification. It was designed by the writer at the test laboratory at Moncton shops.

The frame, of ⅝ in. bar brass, is 35 ins. high, fitted with brass sockets with base of walnut. At A is shown the piece of rubber to be tested. These sections are cut out of the inner and outer tubes of the hose, and shaped by a specially designed die. They are first made in strips 1 in. wide, and 5 ins. long, and then cut down to ½ in. wide for a distance of 2½ ins. at centre. The test pieces are held at each end by wooden grips, B.

The elasticity of the rubber is determined by the distance (marks placed 2 inches apart), it will stretch before breaking. The required elongation for test pieces taken from air and signal hose is 10 inches, but for steam hose, other qualities than elasticity are essential to withstand the severe effect of the steam on the rubber, and a stretch of 6 ins. is considered good for steam hose. The strength of the test piece is indicated on the spring C (capacity 50 lbs.) and should show a strength of from 800 to 1,200 lbs. a square inch. Bevelled gear in box, D, with crank regulates the travel of the spindle, E, the maximum travel being 12 inches.—Can. Gov. Ry.'s Employes' Magazine.



Rubber Tensile Testing Machine.



Jig and Tools for Milling Piston Valve Bushing Slots.

Milling Slots in Piston Valve Bushings, at Michigan Central Railroad Shops.

The customary practice in machining the steam passage slots in piston valve bushings, appears to be the use of the end mill, with the bushing mounted on a table in front of the mill. This was the practice in the Michigan Central Rd. Shops at St. Thomas, Ont., until recently. The bushings used on the company's locomotives have either 7 or 9 slots. Milling these out with the end mill in the usual manner, the cost was 40 cts. per slot; with the method now employed the cost has been reduced to 40 cts. for the whole set of holes, a reduction of from 80% to 90%.

The jig and tools employed in this new method are shown in the accompanying illustration. The jig consists of a special face plate a, pivotted on the front of which is a tapered cone b, the larger end of which is away from the face plate, towards which it may be forced by the hand wheel c, on the inner end of the pivotal pin d. Around the outer face of the cone b, there is a four part ring, e, held together by a spring in an annular groove around the outer face. Several sizes of these rings are employed, to accommodate varying inside diameters of bushings; one of the rings is shown at f. The bushing to be slotted g, is slipped over the ring, and held in place by a clamp on the outer end of the pin d. The cone b is indexed with holes corresponding to the number of slots to be milled, the index pin being in the back face of the face plate. With this indexing as a guide, the first hole is set up, the bushing centred, and the milling arbor h, sunk into the slot the required depth. The operation is performed on a horizontal miller.

Railway Construction Balances in Alberta.—The proceeds of the securities of the various railways building lines under a provincial guarantee of bonds are held in the banks at Edmonton and paid out by the Provincial Treasurer, on receipt of authenticated construction certificates. The Premier informed the Legislature recently that the following balances were on hand to meet certificates as they were presented: Alberta and Great Waterways Ry., $5,309,874.25; Canadian Northern Ry., $1,148,959.85; Canadian Northern Western Ry., $2,759,652.39; Grand Trunk Pacific Branch Lines, $1.00; Edmonton, Dunvegan and British Columbia Ry., $1,639,081.39; Lacombe and Blindman Valley Ry., $140,186.91; Total, $10,997,755.79. There had been paid to the several railways as interest on the proceeds of the bonds held awaiting expenditure: Alberta and Great Waterways Ry., $1,302,276.47; Canadian Northern Ry., $223,992.95; Canadian Northern Western Ry., $88,149.29; Grand Trunk Pacific Branch Lines, $107,676.34; Edmonton, Dunvegan and British Columbia Ry., $270,405.15; Lacombe and Blindman Valley Ry., $2,619.10; Total, $1,995,119.30.