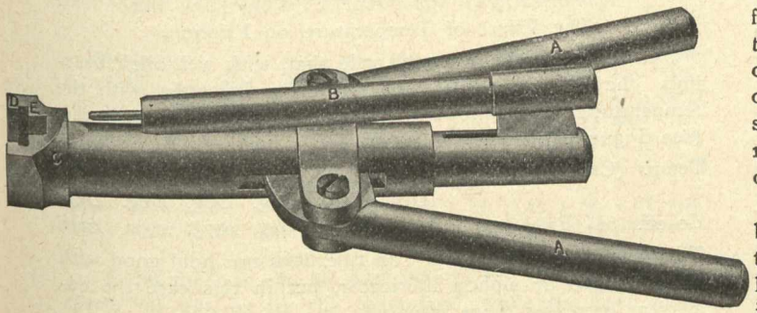
STEVENS-POPE CAPPER.

The Stevens-Pope gun decapper and recapper, just placed on the market, is stated to be the most practical contrivance on the market for this purpose. It is here illustrated and is described as follows:



The body C is hollow and contains a plunger for seating primers and a spring for returning parts to initial position. To the rear end of this body are fulcrummed levers—A A—which engage said plunger. To the rear end of this plunger is hinged the expeller B. The forward part of the body has a slot D for receiving head of shell for capping, and a slot E into which primer is dropped, coming to exact position to enter primer pocket. In operating it the tool is held in the palm of hand with levers A A wide open; the thumb is pressed on the rear end of expelling plug B, lifting same so the shell is slid on to it freely, the head of shell passing over shoulder C. On removing thumb, the shell drops down so the head of shell falls behind shoulder C, which prevents shell shifting position when levers A A are closed expelling old primer. The shell is then withdrawn and reversed with one motion, and head of shell dropped into slot D, a primer is then dropped into pocket E and levers again closed, seating the primer.

This tool is very light, powerful and does not soil the hands as others do. It is made for standard calibres.

The new double-barrel shot gun, which the J. Stevens Arms and Tool Co. has put on the market is now made in various weights from seven pounds to eight and one-half pounds. This company, whose headquarters are at Chicopee Falls, Mass., has had to again remove its New York offices to get accommodation for its increased business. The present offices at 98 Chambers street having four times the space their late offices (No. 80 in the same street), had. This is in keeping with the growth of the factory at Chicopee Falls, which has increased from 44 men, seven years ago, to 1,100 men to-day, but even with the addition of a third factory and this increased force, they have not been able to fill all orders promptly.

The vicinity of Kamloops is the scene of an irrigation experiment carried on by English capital. A plot of 6,000 acres between the North and Main Thompson rivers has been laid out for fruit ranches. A ditch 18 miles long will convey water for irrigation from Jameson Creek. The land thus watered will be disposed of in small holdings, averaging from 30 to 50 acres. A portion of the area has been irrigated in the past, and settlers are moving in.

The following aids to navigation have been provided: New lighthouse at Kincardine to replace one burned last year; steam fog siren in connection with town waterworks machinery at Kincardine; light house at Varennes, Que.; lighthouses at Otter Head and Slate Island, and range lights at Point aux Pins, Lake Superior; Low Point, Flint Island and Scatarie Island lights, Cape Breton, improved; range lights at Pt. Edward, C.B.; whistling buoy at Gavin Island, near Gabarus; protective piers at Grand Narrows bridge, Bras d'Or lakes; acetylene gas for Stonehouse Point light, near Cornwall. It is understood that the old wooden light houses at Fort William, Lake Superior, will be replaced by two steel towers.

FRICTION ON LUBRICATED SURFACES.

By F. A. McKay, S. Can. Soc. C.E.

It is a well-known fact that when two bodies have their surfaces rubbed together, no matter how smooth those surfaces may be, there is a force which tends to prevent them from moving. This force is called friction, and is caused by the particles of one body intermingling with those of the other. When a force is applied which would cause motion of the bodies in planes parallel to each other, these particles strike against one another, are broken off, and are either rubbed into the surface of the other body, or are thrown down in the form of dust.

If, however, we introduce a substance such as an oil between the two bodies we separate them, and, therefore, there is no striking of the particles together, but rather the layers of oil slide over each other, motion will be less impeded, and consequently we say that friction is reduced.

The Relation of the Normal Pressure to Friction.

Probably of all the influences which govern the amount of friction there is none which has more effect than pressure.

At ordinary pressures the co-efficient of friction varies approximately inversely as the load per square inch.

At low pressures the co-efficient of friction becomes greater, but this is not so much on account of the diminution of pressure as it is on account of the viscosity of the oil.

At very high pressures the co-efficient of friction again takes a rise, but this is also from another cause. It is because the oil is squeezed out from between the bearings and the surfaces come in contact, causing a very large increase of friction.

A number of papers, read before the Institution of Mechanical Engineers of England, have thrown considerable light on this subject.

The first paper was read by Mr. Beauchamp Tower, P.I.M.E., 1883, p. 632, and it gives the result of some of his experiments made on the machine, of which the following is a description. (See Figure 1.).

The journal (F) is four inches in diameter and six inches long. Upon (F) rests a bronze bearing (A), which nearly but not quite half surrounds (F). On (A) is a cap (B), which in turn is bolted to another piece (C), which carries a knife edge (E). On this knife edge swings a bracket (D), which carries the weights (W).

The distance from the centre of the journal to the knife edge is five inches.

When the journal rotates it tends to turn (A) with it, and will throw the knife edge off the centre line.

Let r = The radius of the journal.
s = The distance of the knife edge from the perpendicular centre line.
w = The weights.
Then s x w = The moment of friction.
The friction at the surface of the journal.

$$= \frac{\text{moment of friction}}{r} = \frac{s \times w}{r}$$

Hence the co-efficient of friction.

$$= \frac{\text{friction at surface of journal}}{w} = \frac{s \times}{r \times} = \frac{s}{r}$$

Hence the co-efficient of friction is the relation of s to r and is independent of w.

The long arm (L) is attached, which has a fixed relation in length to the distance between the centre of the journal and the knife edge. The deflection can, therefore, be read off on the revolving roll or scale.

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*The Canadian Engineer Prize offered to student members of the Canadian Society Civil Engineers for the year 1902.