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The Canadian Engineer

Vol. II.—No. 1.

TORONTO, MAY, 1894.

PRICE, 10 CENTS
\$1.00 PER YEAR.

The Canadian Engineer.

ISSUED MONTHLY IN THE INTERESTS OF THE
MECHANICAL, ELECTRICAL, MARINE, LOCOMOTIVE, STATIONARY
AND SANITARY ENGINEER; THE MANUFACTURER, THE
CONTRACTOR AND THE MERCHANT IN THE
METAL TRADES.

SUBSCRIPTION:

Canada and the United States, \$1.00 per year; Great Britain, 5s. Advertising rates on application.

Offices: { 62 CHURCH ST., TORONTO.
FRASER BUILDING, MONTREAL.

E. B. BIGGAR, PUBLISHER R. R. SAMUEL, BUSINESS MANAGER
Fraser Building, Montreal.

Toronto Telephone, 1892. Montreal Telephone, 2589.

All editorial correspondence should be addressed to the Montreal Office.

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WITH SUPPLEMENT.

For THE CANADIAN ENGINEER.

PUMPS AND PUMPING MACHINERY.

BY WILLIAM PERRY, MONTREAL.

The date from which we commence the history of pumps is the year 200 B.C. Previous to that period there is no mention made of them. Nor has there been discovered any portion that can be judged appertaining to such a machine; the heathen Chinese cannot claim any priority in this special branch, which is peculiar, the more so when we consider their manner of irrigation. A pump is even now a rarity with them.

A pump is not a very intricate machine in itself, and its parts are comparatively few. But its action, or want of it, sometimes makes it seem most mysterious. To those readers who have not considered the question of water dispensation, the remark that pumping machinery stands prominent among the various branches of engineering, may seem to allow of discussion. A few instances will very soon give ample proof. How could our coal be obtained and our mines worked, if not for the pumping plant? Our water supply obtained, or our sewage and chemical works carried on? When man enters Nature's storehouse in search of wealth, he finds water ever ready to dispute his supremacy; it may be in a constant stream, varying only with the

season; oftentimes vast quantities are stored in crevices of the rocks. Some idea of the quantity of water raised will be given when it is known that often its weight is double and treble that of other material raised, and is frequently 30 per cent. in coal mines.

Rude nations have not possessed the machine, simple as it is, but have always resorted to a more laborious method to obtain water. In the early ages it does not appear to have been known to the Greeks or Romans. Although the pump was invented 200 B.C., it was not until the beginning of the 17th century that its true principles were understood; although in 1636 fire engines were built in Holland, and from which, as far as general principles are concerned, no improvements have been made. In 1582, Peter Morris, a Dutchman, contrived a water engine to supply the residents of London from the Thames, and threw water over the steeple of St. Magnus church at the north end of London Bridge. The introduction of machinery for domestic use commences from May, 1582. The first patent record in England of a pump is patent No. 6, year 1618, by David Ramsay and Thomas Wildgoose. The air-pump was invented by Otto de Guericke in 1654. In 1660 Robert Boyle made many improvements in the air-pump.

Sir Samuel Morland, Master of Mechanics to King Charles II., in the year 1674 invented and patented the plunger pump, made of cast iron in 1675. He threw water 60 feet high at the rate of 60 barrels per hour, with 8 men, in 1681; the king presented him with a medallion portrait set in diamonds. 1695 is the first notice I have of ship pumps. In 1732 Mr. Demoun invented a pump like a V. In 1741 James Creed secured a patent, No. 579, for making three different machines for making lead pipe for pump use. The first oscillating pump was patented in the year 1750, patent No. 658, by W. Perkins.

The pumps commonly used for raising water from wells may be divided into two classes, lifting pumps and forcing pumps. The lifting pumps may be again sub-divided into two varieties, namely, those with a hollow piston and those with a solid or plunger piston.

1. Lifting pumps with a hollow piston, called also atmospheric pumps. This variety, in its simplest form, consists of the following parts:

A cylinder or tube, in which is fixed a valve opening upwards, and above which works a piston provided with a valve also opening upwards. The part of the cylinder in which the piston works is called the body of the pump, and is the only part which need be bored with any great accuracy. The top of the cylinder may be opened or closed, it matters not which, but somewhere above the level to which the piston ascends there must be an orifice for discharging the water.

The action of the common atmospheric pump is so simple, and is so well known to every school boy, that it will be unnecessary here to dwell upon it. The cylinder is made of various materials, as wood, iron, or copper, and frequently the lower part below the fixed valve is a mere iron pipe furnished with a strainer at its lower extremity. The fixed valve in this kind of