

# The Canadian Engineer

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## PRESSURE RISE IN PENSTOCKS

**P**RESSURE rise in penstocks, due to gradual gate closure, forms an important problem in hydro-electric developments, as it not only affects the design of penstocks, but also the regulation of the plant, which is of prime importance.

The article which starts on page 269 of this issue opens a new field for the investigation of this problem in regard to its effect upon regulation. Mr. Gibson has applied to slow gate closures Prof. Joukovsky's theory of maximum water-hammer, which had been proven experimentally by Prof. Joukovsky himself in regard to instantaneous gate closures. Mr. Gibson also shows the limitation of several formulas that have been in common use, such as Allievi's, Warren's and Vensano's. The accuracy of these formulas has been a source of contention among hydraulic engineers for several years, due to the assumptions upon which these formulas were based.

The solution presented by Mr. Gibson is entirely general in its application, giving correct results for any time or condition of gate closure. The method of arithmetic integration which he first uses for the solution of the problem, is worthy of special note, as many hydraulic problems that do not lend themselves to analytical solution, can be solved by this method.

Water works engineers will also be interested in this article, as frequently the cause of serious breaks in water mains can be traced to excessive pressure rise due to the sudden shut-down of a pump. It is not likely, however, that the broad application of Mr. Gibson's paper will be universally appreciated at first glance. Indeed, one of the country's leading hydraulic engineers states that it will be fifteen years before its full use is realized to the maximum. This can be readily believed when one considers that Prof.

Allievi dealt analytically with this same subject fully 12 years ago in Italy, and that his paper to this day has never been translated into English in its entirety. It may be mentioned that those who are familiar with the original text of Prof. Allievi's work, state that his results coincide with those that have been secured by Mr. Gibson by an entirely different method.

## AEROPLANES IN BUSINESS LIFE

**P**RESENT standards of business efficiency are rapidly undergoing readjustment on account of the introduction of the aeroplane to everyday business activities.

Previously, when an engineer requested samples, he thought that the firms with whom he was dealing were very prompt and efficient if his letters were answered by return post and samples mailed at once by parcels post or express. To-day, the samples are likely to arrive by aeroplane.

A few years ago, when an engineer offered plant for sale, machinery firms sent representatives by train to inspect it, and if they arrived within several days after their presence had been requested, their firms were said to be "right on their job." The modern machinery man is likely to land at your factory door in an aeroplane within a few hours after he gets your letter or telegram.

This will certainly influence the rapidity with which business will be transacted in the future. The example set by a few enterprising firms will extend, and soon hundreds of business men will learn aviation or employ aviators in order to prevent their more venturesome rivals from stealing a march in important deals. Or should we say, stealing a flight?

One alert young business man in Toronto, A. R. Roberts, a dealer in contractors' equipment, declares that he intends to use an aeroplane for business trips to all parts of Ontario, whenever the weather is suitable and the business urgent. A fortnight ago he flew from Toronto to Owen Sound to inspect a boiler in order to be able to effect its immediate purchase for a client. He left Toronto at 2 p.m., stayed in Owen Sound for 2½ hours, and was home in time for dinner at 7 p.m. The scheduled time for trains from Toronto to Owen Sound (one way) is more than five hours. Mr. Roberts began the study of aviation only a couple months ago and purely for business purposes. If he finds it worth while to go to that trouble, are not scores of returned officers, who have had extensive experience in flying at the front, likely to find that their knowledge of aviation is a real asset in peaceful pursuits?

In the United States a large manufacturer of contractors' equipment is now using an aeroplane for advertising purposes. Lt. George M. Comey, late of the A.E.F. air service, and a Curtiss biplane are engaged in distributing free copies of the "Lakewood Aerial Bulletin," a clever house organ published by the Lakewood Engineering Co., of Cleveland. The first issue contains numerous illustrations of Lakewood equipment and also a number of witty remarks, including the following:—

"These bulletins are dropped in an attempt to reach a height equal to that of the quality of the Lakewood line."

"Circulation, highest in the world. No copies delivered by mail or newsboys."

"After decreasing the weight of his plane by dropping these bulletins, Lt. Comey was still unable to reach an elevation equal to the Lakewood standard."

"Frank A. Michell, general purchasing agent of the Lakewood Engineering Co., is accompanying Lt. Comey on this trip. Mr. Michell does not intend to place any orders on the way, but, as he says, just to find out if he can see the top of the high prices."

In the last issue of "Engineering News-Record," of New York, there appeared the following interesting editorial on aeroplane passenger traffic:—

"Speculation has naturally been rife among laymen as to the probability of the early introduction of the aeroplane into regular passenger service. Its possibilities appear to be so great that one is eager to see the predicted development