

Now that a fair price is being obtained it is expected that any increase in demand will be met by increase in production. It is said that American companies are now making only about two-thirds of their normal output. Increase in production will be welcome news for the copper mining districts.

Mr. Bryan's letter dealing with contraband makes clear the United States Government's position with reference to copper. In future American companies will have little ground for complaint if cargoes consigned directly or indirectly to Germany are seized.

CORRESPONDENCE

CENTRIFUGAL AIR COMPRESSORS

To the Editor of the Canadian Mining Journal:

Sir,—In the issue of Dec. 1st, 1914, which has just come to my notice, Mr. A. Willcocks made some interesting comments on extracts from my bulletin on "Centrifugal Compressors," which you published on Oct. 15th. I am sorry the entire bulletin was not published, as it would have probably answered some of the questions raised by Mr. Willcocks.

I agree to the larger part of what he says. I, however, call attention to the fact that the compressed air remaining in the clearance spaces of the cylinder does not return to the piston, in expanding, the same power that it required for its initial compression, and that the difference between the power required for compression and that recovered by its expansion is lost. I also call attention to the fact that when high volumetric efficiencies are obtained by the method of creating high inlet velocities of air, the power required to create this high air velocity is considerable. In other words, a more efficient reciprocating compressor can be built with moderate volumetric efficiencies than with volumetric efficiencies of 95 per cent. and above.

As Mr. Willcocks states, the final and definite basis of comparison should be the amount of steam necessary to compress 100 cu. ft. of fresh air under definite conditions—that is, steam pressure, superheat or moisture, vacuum and total quantity of free air handled, and pressure against which it is delivered. The trouble, however, with this method of comparison is that although such figures can be given accurately for a centrifugal compressor (because all these quantities can be carefully measured by standard methods), some of these quantities cannot be measured in a reciprocating compressor. It is not possible to measure the amount of free air delivered by a reciprocating compressor, nor is it possible to accurately determine the pressure of the compressed air. The reciprocating compressor causes a fluctuation of pressure in the discharge pipe. The mean pressure does not represent the correct averaged pressure of the discharged air. It is also not possible to measure the amount of compressed air discharged, on account of the pulsating nature of the discharge. The air discharged from a centrifugal compressor can be measured by discharging the same through a calibrated orifice and, as the flow and pressure are kept absolutely steady, accurate readings can be taken.

Engineers have tried to do this with reciprocating compressors; but no accurate results can be obtained.

The best possible solution would be to have a reciprocating compressor discharge into a large calibrated gas tank, but the size of the tank necessary prohibits such an experiment. The next best way of comparing the amount of air delivered by a centrifugal compressor to that of a reciprocating compressor of the same rating would be to note its effects when doing the same work, as, for instance, blowing a cupola or blast furnace. This has been carefully noted for several years at many installations, and the general conclusions reached indicate that there is considerable difference between the displacement rating of a reciprocating compressor and the actual air delivered by it. With a centrifugal compressor it takes a much smaller volume of actual free air to perform the same work as is performed by a reciprocating compressor of a certain rating. When the reciprocating compressor is new, and all the valves are tight, volumetric efficiencies of about 85 to 90 per cent. are most common. When the reciprocating compressor has been in service for a short time only, this volumetric efficiency is decreased, due chiefly to wear of parts. Most guarantees for steam consumption on steam engine driven reciprocating compressors are based on the indicated number of pounds of steam used in the engine, to the number of cubic foot displacement air delivered. This is sometimes accompanied by a statement of volumetric efficiency. The guarantees on a steam driven centrifugal compressor are based on the number of pounds of actual steam used for every 100 cu. ft. of free air delivered. In order to compare the two, the customer must assume a volumetric efficiency, and must also assume the ratio between actual steam supplied to an engine to that which is shown on its indicator diagram.

For a confirmation of the above, I would like to refer to a paper by Mr. F. G. Cutler, of the Tennessee Coal and Iron Co., read recently before the Iron and Steel Institute at their last meeting in Birmingham, Ala. In a most careful analysis, he states when referring to their reciprocating compressors, "The ratio of the actual delivery to air displacement was about 80.2 per cent."

Yours, etc.,

L. C. LOEWENSTEIN.

Toronto, Jan. 14, 1915.

GOLD DISCOVERY AT JERSEY MILLS.

To the Editor of the Canadian Mining Journal:

Sir,—Enclosed please find a photo of a nugget of gold, value \$50.00, found on Dec. 5, 1914, on the shore of the Du Loup river here at Jersey Mills, by a little boy going to set a trap for mink. I hope you will mention the discovery in your valuable paper. Gold lies on clay in the bed of the river. I am willing to give free of charge two miles of the river, providing a dredge is built.

Yours, etc.,

LOUIS GENDREAU.

Jersey Mills, Beauce Co., Que., Jan. 18, 1915.

ANNUAL MEETING, CANADIAN MINING INSTITUTE.

The 17th annual meeting of the Institute will be held in Toronto on Wednesday, Thursday and Friday, March 3rd, 4th and 5th. An interesting programme is assured. In addition to the reading and discussion of papers on technical subjects, topical questions of general interest to the mining communities will be debated. These latter include a consideration of the