DUPLEX BELT POWER AIR COMPRESOR.

The illustration in this article shows a Duplex Belt Driven Air Compressor recently constructed by the Canadian Rand Drill Co., of Sherbrooke, P.Q., and in connection with the same is shown a new method of driving such compressors recently originated by the Rand Drill Co. The illustration showing the system of driving is almost self-explanatory, and it will be seen at once that it employs the system of turbine construction by which the wheel is placed upon a horizontal shaft. This construction of turbine is becoming extremely popular in the United States for nearly all power purposes, as in many cases it avoids a targe amount of transmission gearing, and brings the wheel above the floor level, where it is extremely accessible. These advantages are apparent from the second illustration.



DUPLEX BELT DRIVEN COMPRESSOR.

Wherever the head of water is sufficient, the Canadian Rand Drill Co. prefer their system of driving, by which a Pelton water wheel specially adapted to the water fall being utilized, is mounted directly upon the crank shaft of the compressor, thereby making a water power compressor of the simplest possible construction. That system is not, however, of universal applicability, as in many cases the head of water is not sufficient to suit it, and in such cases the construction here shown is adopted.



DUPLEX COMPRESSOR WITH SPECIAL TURBINE.

The compressors are of the most substantial construction, contain all the latest improvements, and are designed especially with a view to satisfactory service at points far removed from the place of manufacture, and with the indifferent attendance which must be depended upon as the only alternative in many such situations.

A NEW bronze, called Roma, has lately been introduced in France. It is said to be much superior to manganese bronze and phosphor bronze. It contains copper, phosphorus, tin, aluminum and manganese. Roma is a pale yellow, has a specific gravity of 3.5, and melts at a temperature of about $1,000^{\circ}$ C. As it does not corrode in sea water, and is not magnetic, it is preferable to steel for the hulls of steamers. It is said to have shown a strength of $24\frac{1}{2}$ tons per square inch for castings, 31 tons for forgings, and 35 tons for rolled metal; all of which is certainly very extraordinary. Possibly the cost of it is so high as to prevent its extended use.— Engineer.

Editor CANADIAN ENGINEER: A TIDAL MOTOR-THE NEXT GREAT POWER MACHINE.

SIR, - I was living last winter on the Thames embankment in London, and just across the street from our windows was the river, ever alternating between flood and ebb—high and low tide. It bore on its bosom great barges and scows, full freighted with coal, now quite up level with the pavement, their hulls standing even above the roadway, and again sunk down into what almost seemed like an abyss, for at London the tide rises and falls at least 14 feet. To lift a loaded steamship, weighing, with its freight, perhaps 20,000 tons, was as easy to this monstrous power as to float a fallen leaf. I came to feel towards the river as if it were a thing endued with life—an awful Titan—a weird being pulsating twice every twenty-

four hours -lifting and lowering -now swell ing, now shrinking-rising to the street level and falling again-intermitting and reversing its action like an engine. The query continually rose to my mind, Why is this illimitable power not harnessed to work for man? As I am but a layman, will you not explain to me why the alternations of the tides cannot be economically profited by?

Is it not possible to have vessels of convenient weight to handle, say 1,000 tons, lifted by the tide 14 feet, and perhaps at that altitude shifted on to a railroad track; these weights in falling to be used to work machinery to develop electricity, which could then be distributed widely, as at Niagara, to produce power, light and heat? Thus the great smoke nuisance of London would be abated, coal mining and transportation diminished, the danger of conflagrations from coal fires and petroleum lamps minimized, and insurance reduced to its lowest terms. Can water be clarified by electricity?

Certainly, it is in the direction of these now wasting powers being brought to serve mankind that inventors should seek. Take the phosphorescent light of a fire-fly as an example ; this little insect (a large proportion of whose machinery and energy must be employed in flying), can give a light which can be seen high up in the trees, 150 feet away (perhaps, indeed, 150 yards away) What cheap capacity of illumination Nature gives it ! Yet, till Tesla (see April Century), no one seems to have given themselves to

"catching on" to the fire-fly, or the glow worm that gilds the evening flower, or the animalculæ that make the ocean brilliant. It may seem to chase an igniis fatuus to follow such a Will-o'-the-Wisp as the fire-fly or a tidal motor; but there was a practical dreamer all the same, who saw a dissipated puff of steam lifting a humble tea kettle lid; and I am now striding across 3,000 miles of water, as poor Peter could not do, on what is but a magnified and glorified tea kettle, an old iron pot "shaped like a whale," "backed like a weasel," and forced along by a watery cloud, which working a little screw that is infinitesimal compared with the ponderous ten or twenty thousand ton mass it shoves along by pushing a blade against a substance as soft, unstable

and yielding as water. We have, as yet, only taken a few pieces of Nature's machinery out of her unlimited store to make them serve us—let us grope till we get a tidal motor.

Will you not do something to stimulate the search for an economical method of harnessing up the tides, help hunt for the bit and bridle to put in the mouth of this, as yet, untamed leviathan ? I suppose the first thing to do is to write up a bibliography of the subject, and give a resume of what has been successfully and what unsuccessfully attempted. The next step, after publishing these results, would be to offer a prize for the best essays on the topic. Will you not through your paper organize "The Tidal Motor Search Expedition?"

Napoleon, desiring to injure the British, offered a prize for the discovery of a plant grown in France from which to extract sugar. This resulted in the beet root sugar industry.

If the nations having territory on tidal waters, or even one of them, would offer a prize for an economical tidal motor, we might depend upon having some successful method of utilizing the tidal power.