

TRANSMISSION OF POWER.

Translated from "The Ingenieur-Conseil" of July 15, 1889.

Transmission by belts is a relic of routine which should be rooted out, as has been already done with the ancient gear-wheel transmission. I venture to predict that by the time another exposition is opened belts will have entirely given away to ropes. I make this prophecy with all the more boldness since belts have not the theoretical superiority over ropes which gearing had over belts. It can already be said that in theory and in practice belts are inferior to ropes, since they can only be made to adhere by a tension of both parts—that is, the part which does no work must have at least half the tension of the part which bears the working strain. Without this tension the belt would slip on the pulleys. No change of material or of make-up can correct this essential fault—the necessity of stretching to accomplish adherence.

With ropes, however, the adherence of the rope to the pulley is effected by the pressure against the sides of the wedge-shaped groove, and the useful tension, that of the working part of the rope, is sufficient to produce this pressure. The lower part of the rope has no need of tension. Thus, in theory, the rope is better than the belt, and in practice no draw-back arises to offset this advantage. On the contrary, rope cannot slip—like belts—from pulleys. The breaking of a rope occasions no stoppage, no accident. The rope falls harmless to the ground and can be replaced after working hours. It even announces when it intends to break by visibly unwinding.

For thirty years we have sustained the rope idea, and made the foregoing argument prevail. We understand the opposition of the routinists at the present time. Very few makers know how to turn out good grooved pulleys, or could supply good ropes. This was a serious difficulty. The slightest inequality in the diameter of ropes, or in size of grooves, or even in the compressibility of the ropes, causes them to bury themselves in grooves more or less, so sensibly altering the circumference run over by the different ropes on a single pulley, and consequently give rise to considerable resistance, certain ropes acting as brakes towards the others, instead of assisting them.

At the Exposition transmission by ropes is practiced by three Belgian firms, two Swiss firms, and two French; all others employ belts.

Why? We cannot explain, but when the next Exposition opens we will see if they continue to inflict upon their patrons a mode of transmission which, whatever be the ingenuity of the makers of belts, leather, cotton or steel, will always cost more, absorb more power, and cause more stoppages than transmission by ropes. Until that time the Belgian firms have found themselves in excellent company among the constructors of machinery who have adopted this method of transmitting power.—From the Ingenieur-Conseil of July 15.

The above extract is confirmatory of what has been advocated by THE DODGE WOOD SPLIT PULLEY CO. from the commencement, *i. e.*, that power transmission by ropes is far superior to belts for general purposes, and applicable for distances and in places where neither belts nor gearing can be used at all.

The French writer intimates clearly that for thirty years he has recognized this superiority of ropes, and yet the people have refused to be convinced. This argues a fault in the system which he advocates, and that fault is not far to seek. The system which he advocates is known as the "English" system. It consists of a multiplicity of separate ropes, and the "fault" resides in the impossibility of attaining an equal tension of the several ropes. That this lack of uniform tension is the condition of every "English" rope transmission is evident to the eye. No two ropes of the system hang with the same slack, and it needs no argument to show that for that reason no two are doing the same duty. The rope having the strongest tension is, therefore, overloaded, and will be first to give out; and it is small consolation that its giving out does not stop the works, since the fact that a part of the system is doing no work shows that the whole thing is an overload, and that a much smaller outfit would do the work with equal satisfaction if properly constructed.

That is precisely what has been accomplished by the American System as brought forward and perfected by the Dodge Manufacturing Company, wherein a single endless rope having any required number of passes, and under uniform tension throughout, transmits power uniformly, each strand doing its full share of the whole duty.

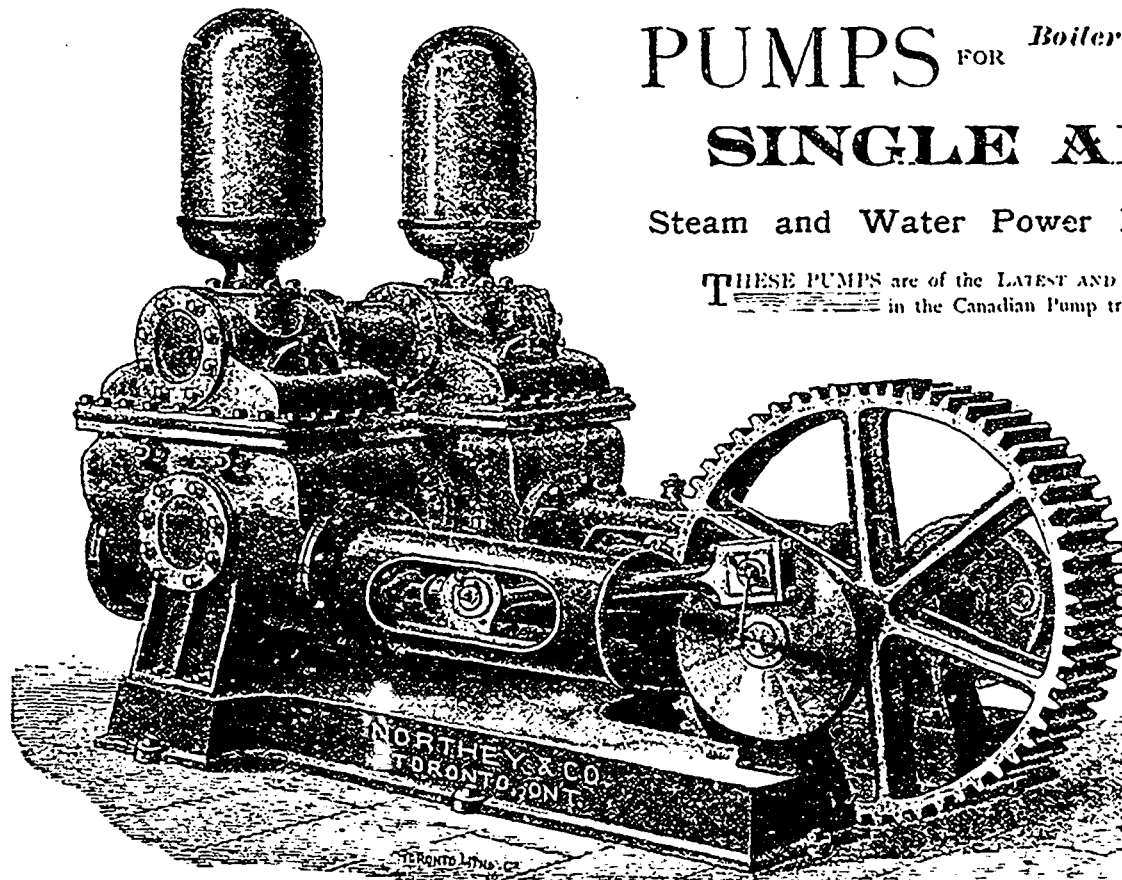
While thirty years have so far failed to show the practical advantages of the English multiple system, that in the year 1889 only seven users of it appear in the great Exposition at Paris, and American engineers have, almost to a man, repudiated it, the American single rope system has in three years attained a popularity almost unprecedented, and bids fair in the near future to supplant belts for all purposes except the smallest.

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