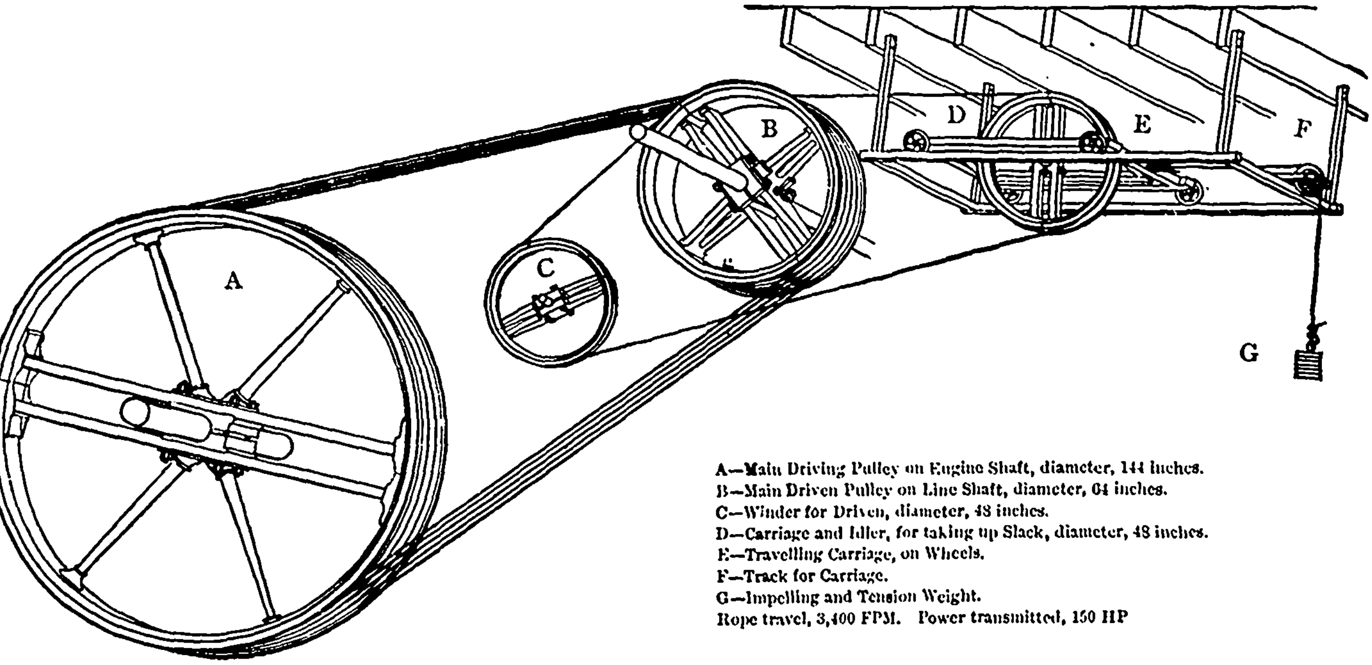
THE TRANSMISSION OF POWER BY ROPES AND THE DODGE PATENT WOOD PULLEYS.

The great advantage of Wood over Iron as a material for belt pulleys (or drums) to transmit power economically, has induced the DODGE WOOD SPLIT PULLEY CO., of Toronto, to introduce grooved hard wood pulleys for the special purpose of transmitting power by ropes (manilla tallow laid), and in this connection Mr. Dodge has taken out Canadian Letters Patent for a system of applying the ropes, adjusting the pulleys, and taking up slack, that is giving the most unqualified satisfaction.

This system of transmitting power by ropes is cheaper and superior to belts in many cases, such as where the driven shaft is at right angles with the driver, also where the drive is perpendicular, particularly when it is quarter twist and perpendicular; also where the driver and driven are close together; also for long drives, such as across a street, or a stream, etc. For transmitting power from an engine to the line shaft this system is unequalled; steady all the time, not like a heavy belt, which is always more or less flapping, jerking and stretching, then slipping and losing power. It is safe to say that an engine hitched up by the Dodge Rope System will do 25 per cent. more work on the same consumption of fuel than the same engine would do with a belt. We have put up a number of the Dodge Patent Rope transmissions during the past year, all of which are in most successful and satisfactory operation, as certified by the testimonials published in our catalogue of well-known manufacturers who have them in use. Parties who are in want of anything in this line, or who are interested in the efficient and economical transmission of power, are cordially invited to call at our works, 81-89 ADELAIDE STREET WEST, Toronto, and see the ropes and wood pulleys in operation, as we are driving our whole factory by this system.

WITH OUR SYSTEM OF MANILLA ROPE TRANSMISSION is overcome the objection to Wire Rope (because of crystallizing) and gearing, (because of loss of friction) and shafting (because of the liability to get out of alignment, hence loss of power by friction), and a separate engine plant (because of its great expense); on the contrary, with the Manilla Rope System, under the Dodge patents, the power is transmitted with the same efficiency as though the shafts were close together, there being no loss of power by excessive tension, or bad alignment, but simply the friction of the journals to overcome at the carriers, which have a strain of weight of the rope to carry.



A—Main Driving Pulley on Engine Shaft, diameter, 144 inches.
B—Main Driven Pulley on Line Shaft, diameter, 64 inches.
C—Winder for Driven, diameter, 48 inches.
D—Carriage and Idler, for taking up Slack, diameter, 48 inches.
E—Travelling Carriage, on Wheels.
F—Track for Carriage.
G—Impelling and Tension Weight.
Rope travel, 3,400 FPM. Power transmitted, 150 HP

The illustration, as shown above, is one of peculiar construction, and represents an engine transmission of power by a manilla rope, under the Dodge system of patents, and is shown as in actual use at the works of the Dodge Mfg. Co., at Mishawaka, Ind.

The system herewith illustrated and described is one of great interest to all consumers of power. Inasmuch as it takes the place of expensive gearing and broad belts, the advantages to be thus derived may be thus summarized:

To transmit the same power with a rope *versus* a like power with a wide belt, first, requires much narrower faced pulleys; consequently, much less expensive; 2nd, the interest on the money invested in a belt will more than supply the rope, saying nothing about the wear and tear; 3rd, better power, from the fact that all sliding of the belt is overcome, and the rope gear becomes as positive as the cog gear.

The transmission consists of a series of wood split pulleys, and ordinary manilla rope (tallow laid).

The engine used is an automatic, and the size of the cylinder is 18x40, making 90 RPM, and transmits 150 HP., the driver, A, and driven, B, have each several grooves, in which are wound the ropes, the number of wraps being used, as in previous cases, to gain surface in contact, for adhesion of the rope. The winder, C, in this case, is simply used to convey the rope to the slack carriage, to prevent obstruction. This, together with the carriage pulley, D, are each single grooved. The device for taking care of the slack, and giving the proper tension to the rope, is shown at E, with the impelling weight at G. The slack side of the rope is paid directly from the driver to the carriage, E, which, it will be seen, takes in and pays out slack as it occurs, and acts also for a tension on the rope. The weight at G may be increased or decreased with the power.

This apparatus was erected and started December 2, 1884, and has been running constantly since, with same splice, and transmitting an average of 150 HP.

The rope shows no signs of wear, and looks as though it would last for years to come.

The rope is an ordinary one-inch diameter manilla, and travels at a velocity of 3,420 FPM.

We make the following summary:

Velocity of rope, 3,420 FPM. Transmits, as above, 150 HP. (indicated). The tension on the rope is, therefore, $\frac{33000 \times 150}{3420}$=1,408+106 pounds (one-half the weight in the weight-box)=1,608 pounds; which is the strain on the rope. There being five pulling wraps of rope, hence the strain would be divided five times $=\frac{1608}{5}$ 321 lbs. strain on the rope = $3\frac{4}{5}$ per cent. of the breaking strain of the rope; it being estimated as safe to use 10 per cent. of the breaking strain of the rope.

[The breaking strain of a one-inch manilla rope is 9,000 pounds.]—*Power and Transmission Journal.*