

(No Model.)

2 Sheets—Sheet 1.

J. H. HOADLEY.
ROPE DRIVING APPARATUS.

No. 576,674.

Patented Feb. 9, 1897.

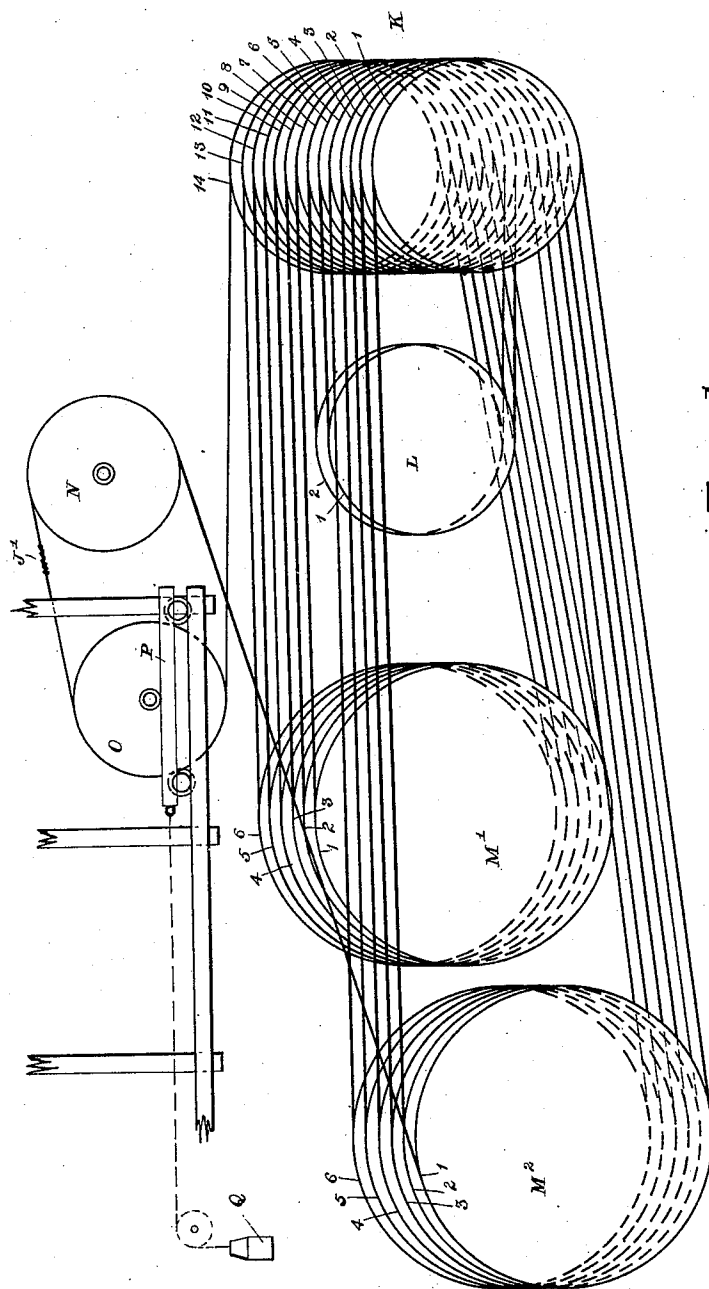


FIG. 1 -

WITNESSES.

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(No Model.)

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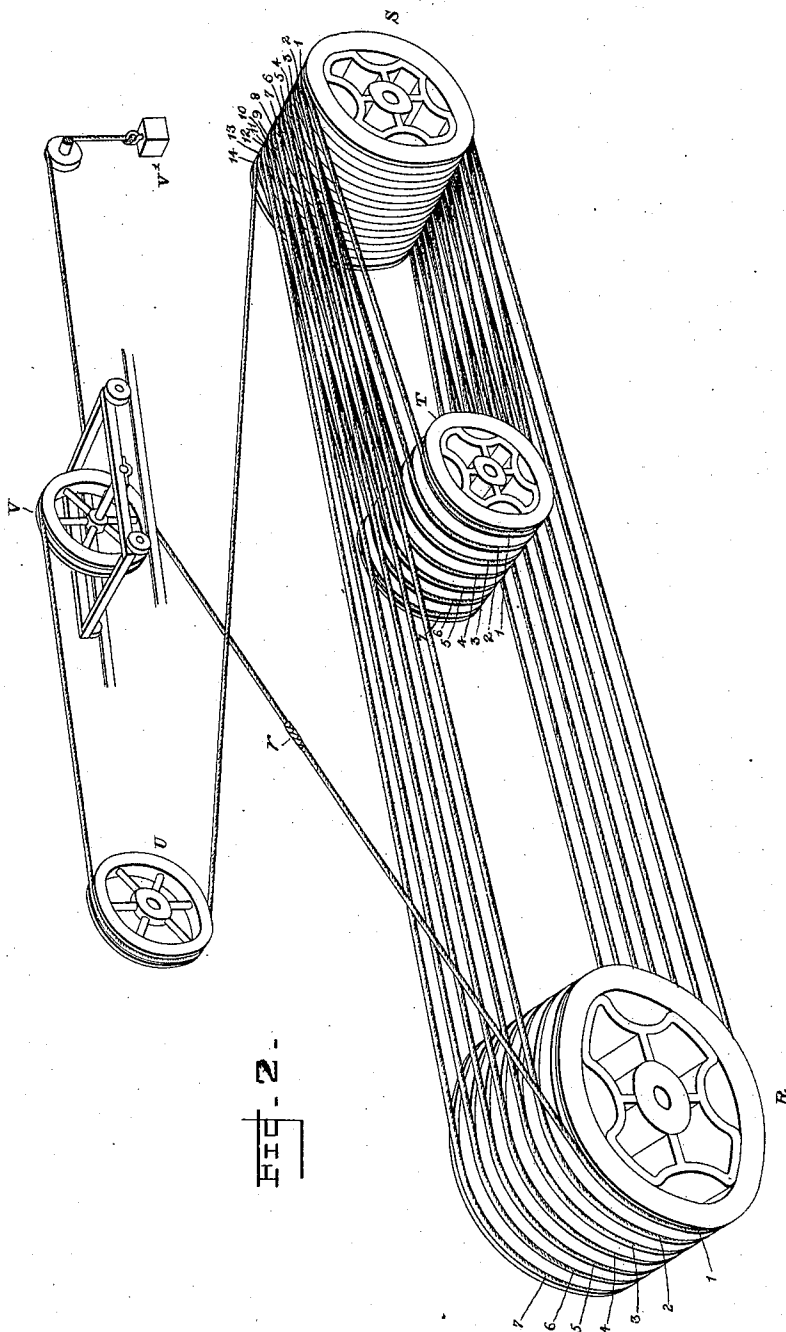


FIG. 2 -

Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH H. HOADLEY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE
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ROPE-DRIVING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 576,674, dated February 9, 1897.

Application filed July 17, 1893. Serial No. 480,729. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. HOADLEY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Rope-Driving Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of power-transmitting mechanisms known as "rope-driving" gearing, wherein a fibrous rope or other operating cable or connection is wound about grooved drums with a number of wraps in such a manner as to create traction for transmitting power from one drum to another, thus operating to accomplish the same result and perform the same function as in the case of flat flexible bands, which are now so commonly employed for the purpose of transmitting power in all kinds of machinery, but in the class of rope-driving gearing there are multiple wraps of a rope that can be varied in number as the amount of power or other conditions may require.

The object of the invention is to increase the efficiency of apparatus of this sort, adapt it for many and various uses for many and various kinds of machinery, prevent loss of power, and enable this class of driving power to be applied in many cases where heretofore it has not been deemed feasible.

The invention therefore consists, essentially, in the construction, arrangement, and combination of parts, substantially as will be hereinafter described, and then more particularly pointed out in the appended claim.

In the accompanying drawings, illustrating my invention, Figure 1 is a diagrammatic view of one form of my improved rope-driving apparatus. Fig. 2 is a perspective view of a different form of constructing my improved rope-driver.

Similar letters and figures of reference designate corresponding parts.

I will now proceed to describe the manner of winding the rope as it is illustrated in Fig. 1 of the drawings. This winding is for the purpose of driving shafts arranged in tandem

from one common driver and is more particularly used for the purpose of driving the two cable-drums used in cable-railway work. It will be found very serviceable for many purposes, and, owing to the peculiarity of the wrapping of the rope about the several drums, enables many valuable results to be attained in transmitting power which have not been possible in other kinds of rope-winds.

Referring, therefore, to Fig. 1, K is the driving-drum. M' and M² represent two driven drums, both of which receive their power from the driving-drum K. L denotes the "compound winder," as I term it. N is the snub-pulley; O, the carriage-pulley; P, the traveling-carriage frame; Q, the weight for taking up slack, and J' the point at which the rope is spliced. Perhaps the most important feature in this present arrangement consists in the location and function of the compound winder L, which receives the wind in such a way that it passes by the flanges on the driven drums, also creating an extra adhesion upon the driving-drum and subserving other valuable and useful purposes, as will be hereinafter more fully set forth. In this view, Fig. 1, the rope is wound in the following manner: Beginning at the splicing-point at J' the rope passes first around the snub-pulley N, thence to driven pulley M² and around in groove 1 thereof. From this pulley it passes to the driving-pulley K and around in groove 1 thereof, then to the second groove of pulley M², then to groove 2 in pulley K, then to groove 3 in pulley M², then to groove 3 in pulley K, then to groove 4 in pulley M², then to groove 4 in pulley K, then to groove 5 in pulley M², then to groove 5 in pulley K, then to groove 6 in pulley M², then to groove 6 in pulley K. Thence the rope passes from pulley K into groove 1 of pulley L, then back to pulley K and around in groove 7 thereof, then to groove 2 of pulley L, then to groove 8 in pulley K. The rope now passes from said groove 8 in pulley K to groove 1 in the driven pulley M', then back to groove 9 in pulley K, then to groove 2 in pulley M', then to groove 10 in pulley K, then to groove 3 in pulley M', then to groove 11 in pulley K, then to groove 4 in pulley M', then to groove 12 in pulley K, then to groove 5 in pulley M', then to groove

13 in pulley K, then to groove 6 in pulley M', then to groove 14 in pulley K. Thence the rope passes to and around the carriage-pulley O to the point of splicing J', so that here we have a complete endless wind in this transmission, as well as in that form of the invention illustrated in Fig. 1. As already stated, this form of transmission is particularly useful in operating cable-railways. It will be observed that all the wraps of the rope pull straight in the grooves of the driven and of the driver on the pulling side, and that the compound winder L has two functions—first, that of enabling the driven pulleys M' and M² to be so situated with relation to each other that their flanges will not come in any conflict, but that the ropes can lead straightly and directly into the respective grooves thereon, and, secondly, the pulley L has the function of creating an additional amount of adhesion for the driving-pulley K in those cases where said driving-pulley is smaller than the driven pulleys.

In Fig. 2 I have represented another form of transmission, having certain peculiarities about its wind, but yet coming within the general conception of the present invention. The way in which the wind in this view is made corresponds in some respects, particularly as to its purpose, to that described and claimed in my other pending application for Letters Patent upon rope-driving apparatus, filed May 25, 1892, Serial No. 434,354. By referring to said application it will be found that the object aimed at is to avoid the slipping of the rope which commonly occurs upon the smaller of two drums in a rope-power mechanism, and in that case the plan by which I overcome the difficulty is to wrap the rope around the smaller drum a greater number of times than I do around the larger, say twice as many times, and in order to do this I have to increase the size of the smaller drum, not diametrically but between its ends, making it thicker or wider, so that more grooves may be formed therein. I also have to provide a third drum or pulley, which I term a "compound winder" and which is used for the purpose of receiving the extra wraps of the rope. Now in said case it will be seen that in passing the extra wraps of the rope around the third pulley I do so with a group of wraps, that is to say, the rope is first wrapped around the driving and driven pulleys and then it is wrapped around the third pulley, and the wraps around the third pulley take place in immediate succession and constitute a group of successive wraps, and consequently a group detached from and not interwoven with the wraps around the driving and driven pulleys. Obviously in this construction there may be one or more of the compound winders situated on either one or both sides of the wraps which pass around the driving and the driven pulleys, but the essential feature of the particular example of compound winder illustrated in the case now being referred to is that

the wraps which go to the third pulley or pulleys shall go in groups of successive wraps, as distinguished from a series of wraps whose members alternate with wraps passing between the driving and driven pulleys. Now in my present invention, as illustrated in Fig. 2 of the drawings, I aim to preserve the same general idea of providing a third pulley to receive the extra wraps of the rope made necessary about the smaller of the two drums in order to create an extra adhesion and avoid the slipping of the rope, but I wind the rope in a different way from what I have done in the other case already alluded to. Instead, now, of having the extra wraps transferred to the compound winder in a group of successive wraps, I carry single wraps around the compound winder and have them alternate with the wraps which pass around the driving and driven pulleys. This mode of winding is found preferable for many purposes to the other. I will now describe in detail how this wind is accomplished.

Referring, therefore, to Fig. 2, it will be seen that R denotes the driving-pulley; S, the driven pulley; T, the compound winder; U, the stationary winder or snub-pulley; V, the carriage-pulley, and V' the weight which takes up the slack. In this case the width of the face of pulley R is exactly the same as the width of the face of pulley S, less one groove. The width of the face of pulley T is exactly the same as the width of the face of pulley R. It will be observed, however, very particularly that the pulley S is provided with fourteen grooves, while the pulley R has but seven grooves, and the pulley T likewise has but seven grooves. It will be noticed, therefore, that the pitch-lines which cross the face of the grooves in pulleys R and T are double the spaces of those on pulley S. Groove 1 at the bottom of pulley R, the bottom being the pulling side, is in direct alinement with groove 1 at the bottom of pulley S, while pulley T is tilted sufficiently to permit its groove 1 to be in alinement with groove 1 on S at the top, while at the bottom it is in alinement with groove 2 on S. Therefore, taking the bottom of pulley T and the bottom of pulley R, it will be noted that these two pulleys are set in such position as to allow the grooves to alternate with the grooves on the bottom side of pulley S.

I will now explain how the rope is wound. Beginning with the splice at point r the rope passes around groove 1 in pulley R, then to and around in groove 1 in pulley S, then to groove 1 in pulley T, then to groove 2 in pulley S, then to groove 2 in pulley R, then to groove 3 in pulley S, then to groove 2 in pulley T, then to groove 4 in pulley S, then to groove 3 in pulley R, then to groove 5 in pulley S, then to groove 3 in pulley T, then to groove 6 in pulley S, then to groove 4 in pulley R, then to groove 7 in pulley S, then to groove 4 in pulley T, then to groove 8 in pulley S, then to groove 5 in pulley R, then to groove

9 in pulley S, then to groove 5 in pulley T, then to groove 10 in pulley S, then to groove 6 in pulley R, then to groove 11 in pulley S, then to groove 6 in pulley T, then to groove 12 in pulley S, then to groove 7 in pulley R, then to groove 13 in pulley S, then to groove 7 in pulley T, then to groove 14 in pulley S, thence to snub-pulley U, then to carriage-pulley V and back to the splicing-point r.
10 This hook-up will be found to be extremely valuable for a multitude of purposes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

15 The combination of driving and driven

drums, the rope wound in a larger number of wraps upon the smaller drum, another drum for receiving the extra wraps of the rope which is so wound that the wraps on the third drum alternate with the wraps upon the 20 other drums, and the idle and the tension pulleys likewise receiving the rope in an endless wind, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH H. HOADLEY.

Witnesses:

WM. R. KALES,
ALFRED H. HOADLEY.