(No Model.)

T. S. MILLER.

ROPE TRANSMISSION.

No. 444,919. Patented Jan. 20, 1891.

Fig 1

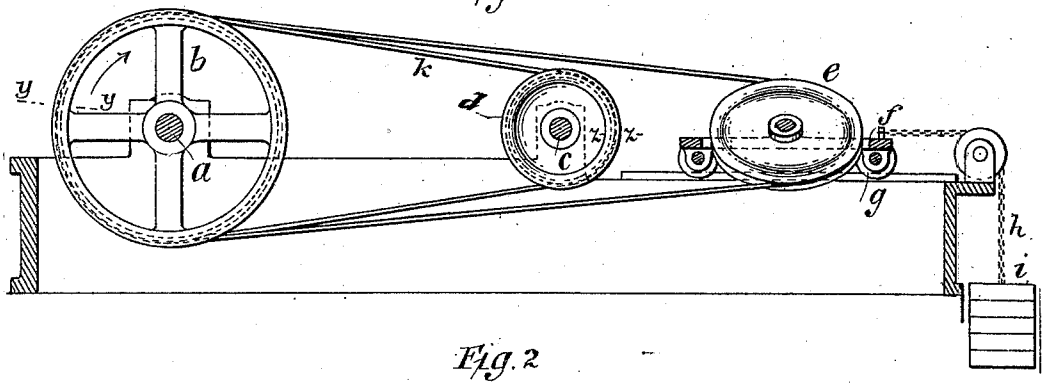


Fig. 2

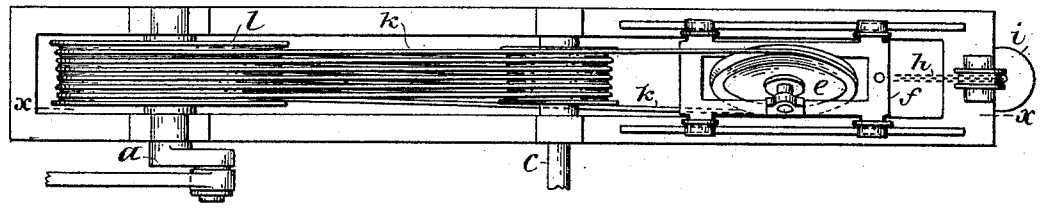


Fig. 3

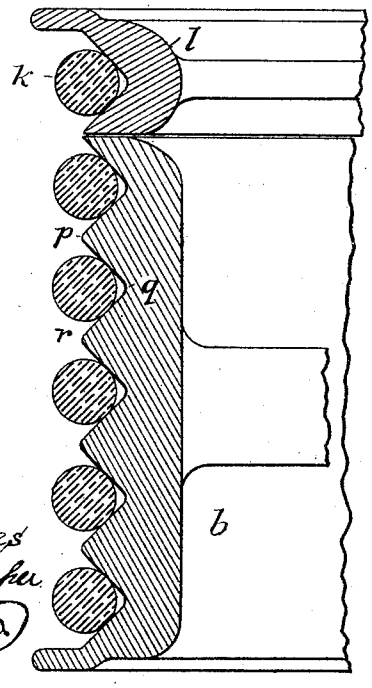
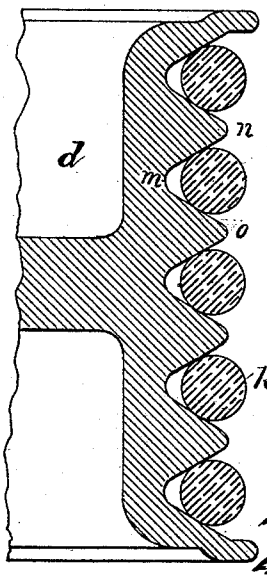


Fig. 4



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UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF NEW YORK, N. Y.

ROPE TRANSMISSION.

SPECIFICATION forming part of Letters Patent No. 444,919, dated January 20, 1891.

Application filed August 6, 1890. Serial No. 361,225. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SPENCER MILLER, of New York, in the county and State of New York, have invented a new and useful Improvement in Rope Transmission, of which the following is a specification.

I believe that my invention finds its greatest utility in the connection with what I will call "continuous-rope transmission," or, in other words, transmission which is accomplished by a continuous rope wound in successive coils around two grooved sheaves and taking one turn around a third sheave designed to maintain the required tension. Heretofore it has been found in practice that in transmission of this character some members or strands of the coil will run under a different tension from others, to such an extent, in fact, that certain of the members will be very obviously slack, and this has been one objection raised to this system of transmission.

The object of my invention is to overcome this difficulty, which I believe to have been discovered to be due to the difference in diameter between the driving and the driven sheave, as the same are generally employed, causing a difference in the arc of contact between the coils upon one sheave and that upon the other, the arc of contact on the smaller sheave being less than the arc of contact on the larger sheave. This difference in the arc of contact, I believe, will cause a difference in the friction, so that the members of the coil are driven by the larger sheave with a greater capacity of power than by the smaller sheave. I propose to compensate for the difference above referred to, and thereby produce a balance of forces, as exists in the case where the sheaves employed are of equal diameters, so that an equality of tension is preserved throughout the various members of the coil, and this compensation I propose to accomplish by the adjustment of the relative form existing between the grooves of the respective sheaves in the manner hereinafter more particularly described.

In the drawings, Figure 1 represents a sectional elevation in an axial direction of two sheaves and connecting-coils on the line $x\ x$ of Fig. 2. Fig. 2 represents the same thing from a direction at right angles to the axis. Figs. 3 and 4 represent a cross-section of the grooves on the two sheaves, showing a relationship which will embody my invention, said sections being taken, respectively, on the lines $y\ y$ and $z\ z$ of Fig. 1.

$a\ a$ is the main driving-shaft.

b is the driving pulley or sheave.

c is the driven shaft, and d the driven pulley or sheave.

e is the tension-wheel, which is journaled in a carriage f, mounted on a track g, and the tension is obtained by any suitable device, such as the chain h and weight i, connected with the carriage.

k is the endless rope by which the power is transmitted. Starting at the tension-wheel e, this rope proceeds around the first groove in the sheave b, thence around the first groove in the sheave d, thence around the second groove in the sheave b, and so on in succession around all of the grooves in the sheaves b and d. After passing around the last groove in the sheave d the rope passes around a groove in a sheave l, which is placed side by side with the sheave b, but is loose on the shaft a. From this loose sheave the rope passes back to the tension-wheel e, where it started. The driving-sheave b is larger in diameter than the driven sheave d, and if the grooves in these two wheels were alike in form some laps in the rope coil would be under greater tension than others. In order to overcome this difficulty, I form the grooves m of the sheave d so that the sides thereof form a more acute angle with each other than those of grooves q of the sheave b. Thus the sides $m\ n$ and $m\ o$ of the grooves in the sheave d, Fig. 4, are shown as forming an angle of sixty degrees with each other, whereas the sides $p\ q$ and $q\ r$ of the grooves in the sheave b are shown as forming an angle of ninety degrees with each other. Of course I merely mention these particular angles to show, in general, a form of construction which will answer well for carrying out my invention, and I do not thereby intend to limit myself to the angles shown, since the principle of my invention is to make the angle of the sheave of smaller diameter, more acute than the angle of the grooves of the sheave of larger diameter. The presence of the loose sheave l will enable the parts to adjust themselves to variations requiring the

operation of the tension-wheel without producing the slip which would otherwise occur in the groove of the driving-sheave *b*.

In addition to the advantages already pointed out, the making of the grooves in one of the pulleys a more obtuse angle produces a condition of things favoring the durability of the rope employed.

I have described the adoption of different angles for the grooves of the two sheaves employed as applied to rope-transmission by a single continuous rope; but I do not wish, unless so specified in the claims, to limit myself to this application; nor do I desire to limit myself to the other forms of construction in which my invention is embodied, as above set forth.

I claim—

1. In combination with a continuous power-transmitting rope, a driving-sheave, a driven sheave of different diameter, and a tension-wheel, the grooves in the sheave of greater diameter forming a more obtuse angle than the grooves in the sheave of lesser diameter, substantially as described.

2. In combination with a power-transmitting rope, a driving-sheave, a driven sheave, an idler-wheel, and a tension-wheel, the driving-sheave and driven sheave being of different diameters, and the grooves in the sheave of greater diameter being of a more obtuse angle than the grooves of the sheave of lesser diameter, substantially as described.

3. In combination, a driving-sheave, a driven sheave of different diameter, and a power-transmitting rope, the said sheaves being provided with grooves, those of the larger sheave having a more obtuse angle than the grooves of the smaller sheave, substantially as described.

THOMAS SPENCER MILLER.

Witnesses:

JAMES T. LAW,

FRED KEMPER.