(No Model.)

A. SAMPER.

APPARATUS FOR TRANSMITTING MOTION.

No. 259,927. Patented June 20, 1882.

Fig: 1.

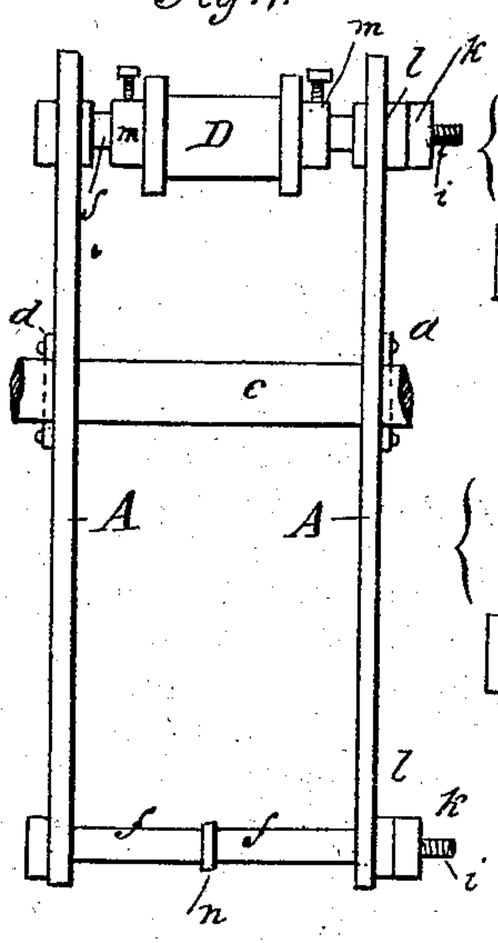


Fig: 2.

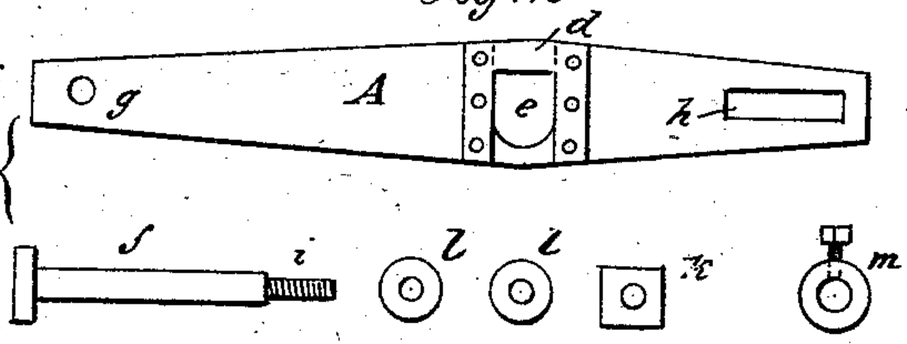


Fig: 3.

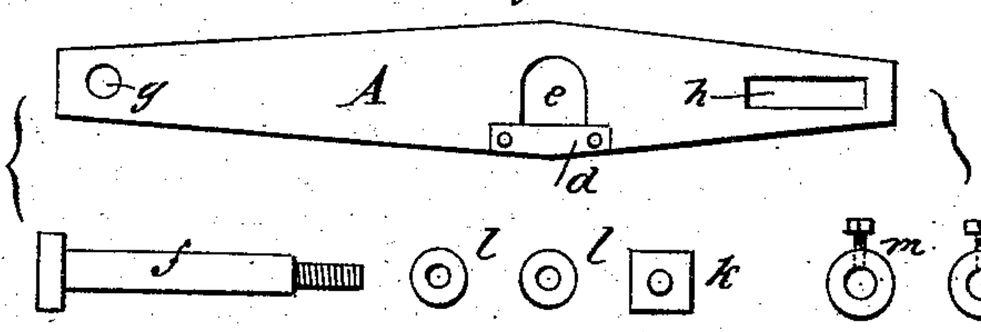


Fig: 4.

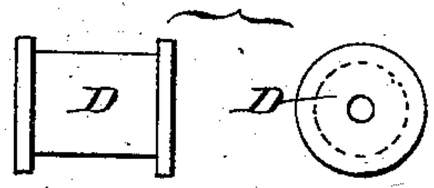


Fig: 6.

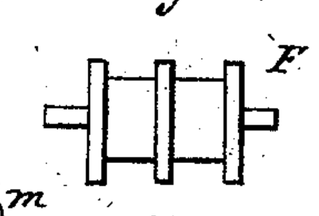


Fig: 7.

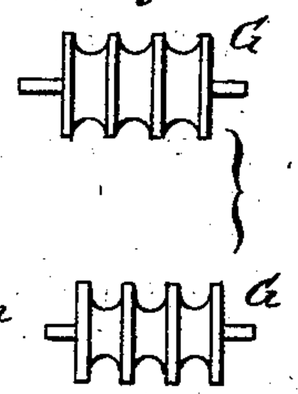


Fig: 8.

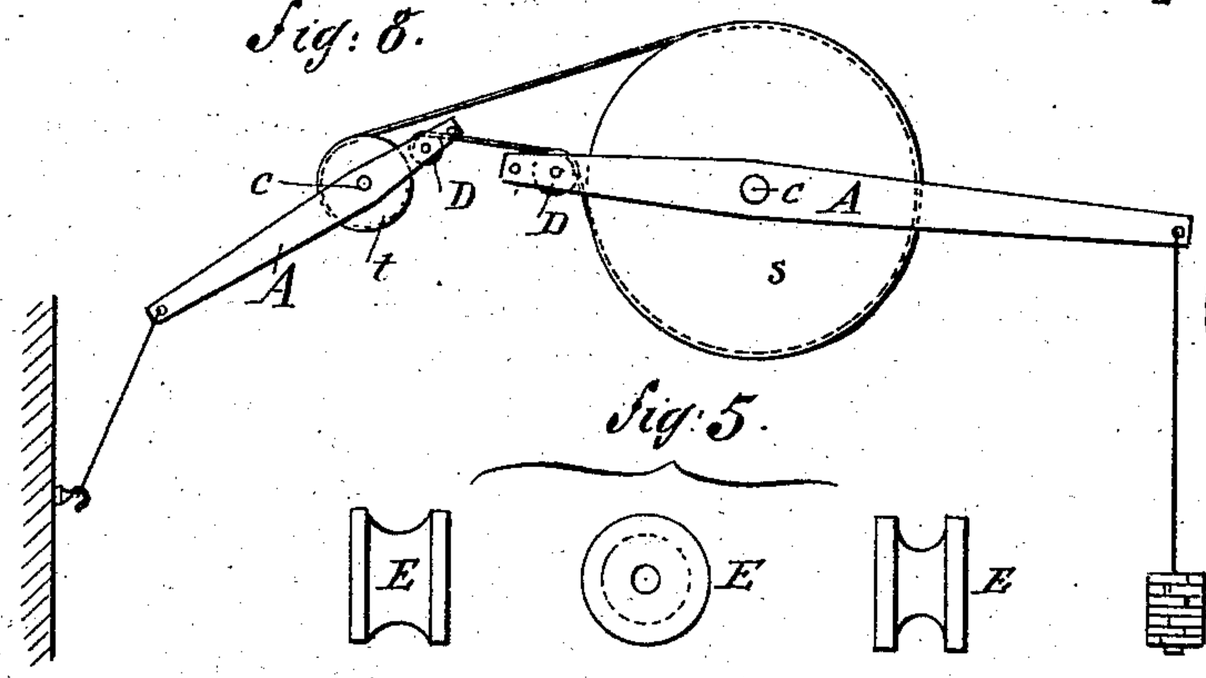


Fig: 5.

Fig: 9.

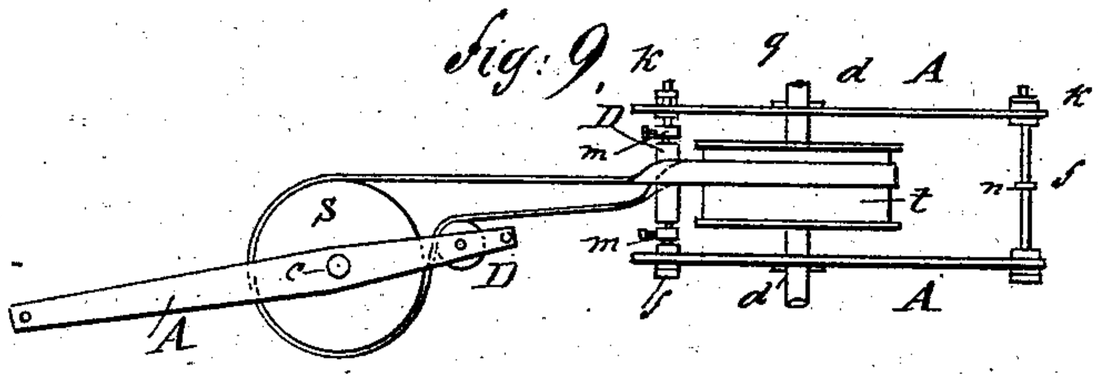


Fig: 10.

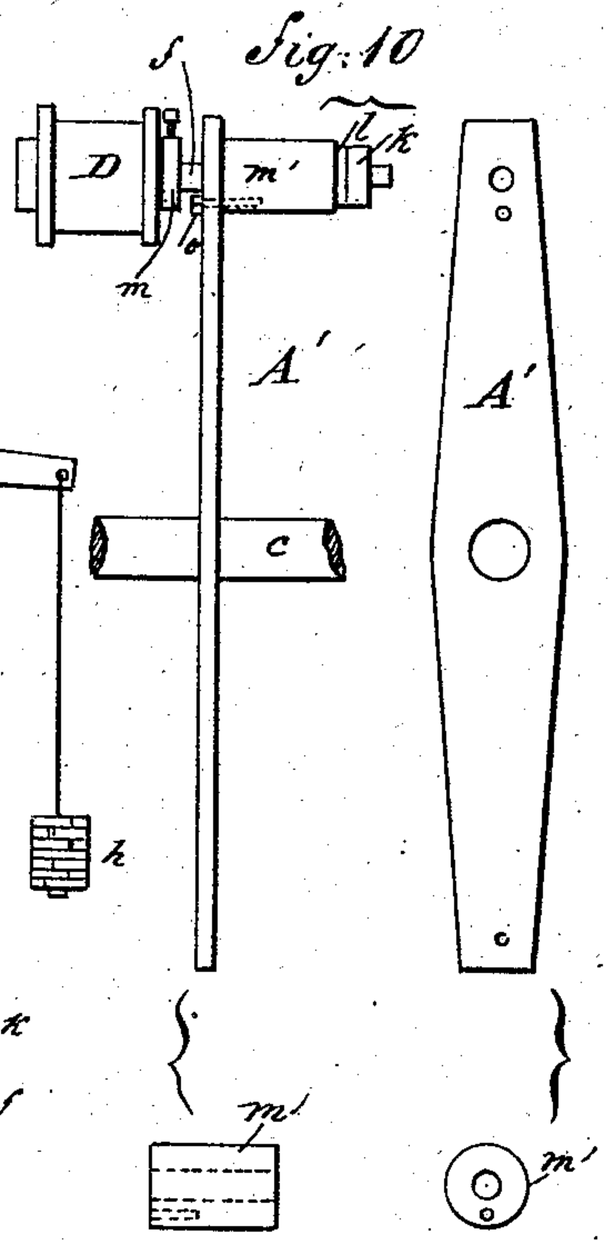


Fig: 11.

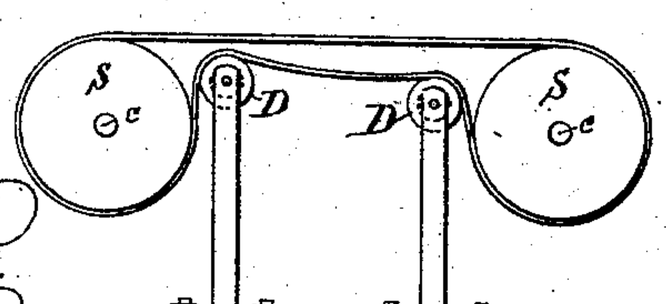
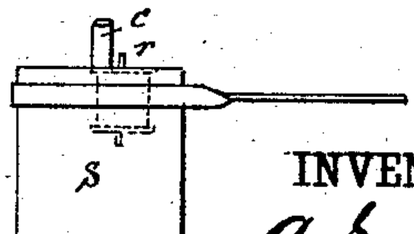


Fig: 12.



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UNITED STATES PATENT OFFICE.

ANTONIO SAMPER, OF PARIS, FRANCE.

APPARATUS FOR TRANSMITTING MOTION.

SPECIFICATION forming part of Letters Patent No. 259,927, dated June 20, 1882.

Application filed April 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, ANTONIO SAMPER, of Paris, France, have invented Improvements in Methods of and Apparatus for Transmitting Motion; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed sheets of drawings, making a part of the same.

This invention relates to improvements in transmitting motion; and it consists more particularly in the novel arrangement of apparatus herein designated an "adhesion device," and the mode of applying the same for the transmission of motion by means of cords and belts running on ordinary pulleys.

The main object of the invention is to guide the cords and belts, to increase the frictional contact of the same, and to obviate the tension to which they are ordinarily subjected, or at least to more or less reduce it, and thus avoid the injurious effects of such tension.

In the ordinary system the cords or belts are subjected to considerable tension either by passing them with a very short length over pulleys or by applying a tension device which allows of motion being transmitted, but does not cause sufficient adhesion of the cords or belts. In some cases, in order to increase the tension, both methods are employed simultaneously. According to the present invention the method employed is entirely different, and the immediate result obtained is that the adhesion of the cords or belts to the greatest possible extent is insured, so that they thus transmit motion with no tension or a minimum of tension which is incapable of exerting the slightest tendency to deflect the spindles or shafts.

In order that the invention may be more readily understood, I have represented one example of the improved apparatus in the accompanying drawings.

The apparatus which I term an "adhesion device" is shown entire and in all its details in Figures 1, 2, 3, 4, 5, 6, and 7. It is composed of two arms, A A, mounted loose on the shaft *c* of the pulley to which the said adhesion device is to be applied. In the example shown in these figures an arm is disposed on either side of the pulley. The two arms A A may be applied without dismounting the said shaft, they being cut away at *e*, so as to fit loose thereon, and fixed by a strap, *d*, which closes the opening. The arms A A are connected by means of cross-bars *f*, which are introduced through holes *g* made at one end of arms A A, and in slots *h* at their opposite ends. These cross-bars are fixed by nuts *k* screwing on threaded portions *i* and bearing against washers *l*. The arms of this adhesion device may be made either of wood or metal. If of metal, they and the strap *d* may be made as shown in Fig. 3. If made of wood the strap *d* (shown in Fig. 2) is preferable, as, besides closing the opening *d*, it strengthens the arm and prevents its splitting.

If a flat belt be employed to transmit the motion, the pulley D (shown in Fig. 4) is placed upon one of the two cross-bars *f*, as represented in Fig. 1, and it is retained on this its axis of rotation by means of two sleeves, *m*, fixed by set-screws, as shown. Upon the other cross-bar *f* is placed at *n* a cord, with counter-weight for obtaining the adhesion of the belt or cords.

Fig. 1 represents the arms A A, mounted in a similar manner on the shaft *c*, for use with a flat belt. If the motion is to be transmitted by means of a round cord or rope, the grooved pulleys E E (represented in Fig. 5) are substituted for the rollers D. (Shown in Fig. 4.)

When two or several belts or two or more cords are used at the same time for the transmission of the same motion, I use in the first case rollers having a proportional number of shoulders like that shown at F, Fig. 7, which has two and is used with three belts at a time for the transmission of motion. In the second case I use pulleys having two or more grooves like that shown at G in Fig. 7, which is used with three cords or ropes at once for the transmission of motion. I place the cord or belt upon the pulleys, leaving them sufficiently slack to embrace the portion of the circumference of the pulleys on which it is desired to produce the adhesion. In any case the stretching of the cord or belt must be allowed for, in order to prevent the advancing and following sides coming into contact. The arrangement shown in Fig. 8 may be taken as an example in the application of my system.

A single adhesion device may be applied to the pulley which most requires it, or one may

be applied to each pulley. In the latter case one of them may be fixed as shown at Fig. 8, or in any other suitable way. I may even in this case fix the adhesion device independently with regard to the shafting, so that the other adhesion device will serve to make the motion regular at the most essential part, it being always loose on its shaft—an arrangement which is one of the most distinctive characteristics of the adhesion device. The adhesion device or devices having been placed in position, the counter-weight *h*, which is suspended to one of the extremities, causes the roller to adhere to the belt, and this roller in turn causes the belt to adhere to the pulley and encircle it to the desired extent. If the belt stretches, it adheres still more to the pulley, and the necessity for tension diminishes because the adhesion of the cord or belt augments so that the counter-weight of the adhesion device, which serves to give a slight tension to the said belt, may be lessened as the belt stretches, which is just the reverse of what occurs in the other methods in use.

The adhesion device may be applied with a single arm, as shown in Fig. 10. In this case the axis *f* of the roller is also supported by a sleeve, *m*, fixed to the arm by means of a nut, *k*, moreover maintained thereon by a screw, *o*.

When all the tension is exhausted with the rollers or grooved pulleys of the adhesion device may be arranged as shown in Fig. 11, or in any other convenient way allowing of their being mounted separate from the driving-shaft, but in such a manner that the cords or belts have a sufficient adhesion on the pulleys. In this case the arms of the adhesion device are fast instead of being loose.

The rollers or pulleys are similar to and fulfill the same functions as those hereinbefore described in respect of the two-armed adhesion device.

Fig. 9 represents an example of the transmission of motion from a horizontal shaft, *c*, to a vertical shaft, *g*. When the pulleys have flanges those of the rollers are dispensed with, as shown in Fig. 9.

In Figs. 8 and 9 the pulleys *s* are the driving and those *t* the driven pulleys. Fig. 12 shows a plan view of the driving-pulley *s*, provided with the roller *r*, the flange of which guides the belt.

Under the generic term "cords" I include chains, ropes, and cables or cords of all kinds whose cross-section is cylindrical; and under the term "belts" I include flat straps of leather or other material which may be substituted therefor, as well as plaited and other bands.

My invention insures the following advantages, among others: first, avoidance of tension and vibration of the shafting; second, facility for applying the cords and belts, as my system enables them to be applied very slack; third, avoidance of loose pulleys to stop the motion, as by a slight movement of the adhesion device taking off its tension the cords or belts may be made loose; fourth, avoidance of belt-forks and other guiding devices serving to prevent the escape of the driving cords or belts; fifth, preservation of the cords and belts, which are of longer duration owing to the suppression of tension; sixth, continuity of motion even when the cords or belts are stretched; seventh, facility for the avoidance or passage of angles, as represented in Fig. 9.

In conclusion, I would observe that the system to which I give the name of "adhesion device" is an improvement on the tension devices actually in use, from which, however, it differs essentially in respect of the advantages hereinbefore enumerated. My system differs also from tension devices in the fact that it is applied upon the shafts themselves, and it is to this arrangement especially that its advantages are due. Moreover, a tension device applied to a belt can only slightly augment its adhesion, while my adhesion device enables the pulley to be almost completely encircled and the cords and belts to be properly guided. It is mounted with facility on the shafts themselves, as previously explained, while the mounting of a tension device presents certain difficulties.

In short, the advantages of my system over a tension device may be summed up thus: complete adhesion, minimum tension, and perfect guiding of the cords and belts. It is, moreover, of very easy application.

I claim—

A frame provided with a counter-balance on one end shaft, *f*, a pulley, D, on the other, and intermediately a driving-pulley on shaft *c*, in combination with a similar frame carrying a pulley, D, at one end, connected to a hook at the other, and carrying a pulley to be driven on an intermediate shaft, as and for the purpose specified.

ANTONIO SAMPER.

Witnesses:

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JEAN BAPTISTE ROLLAND.