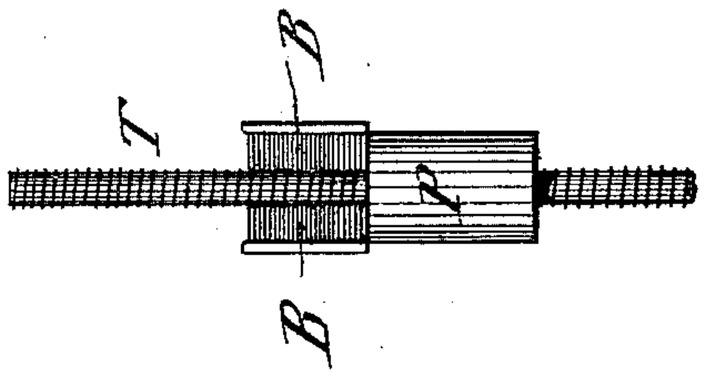
(No Model.)

# R. SNYERS.

## DEVICE FOR TRANSMITTING AND ABSORBING POWER.

No. 458,257. Patented Aug. 25, 1891.

Fig. 5.



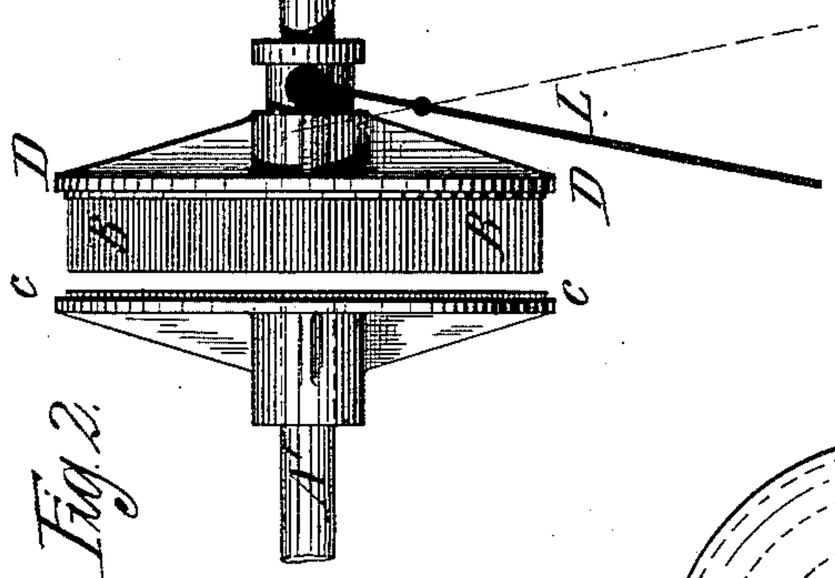
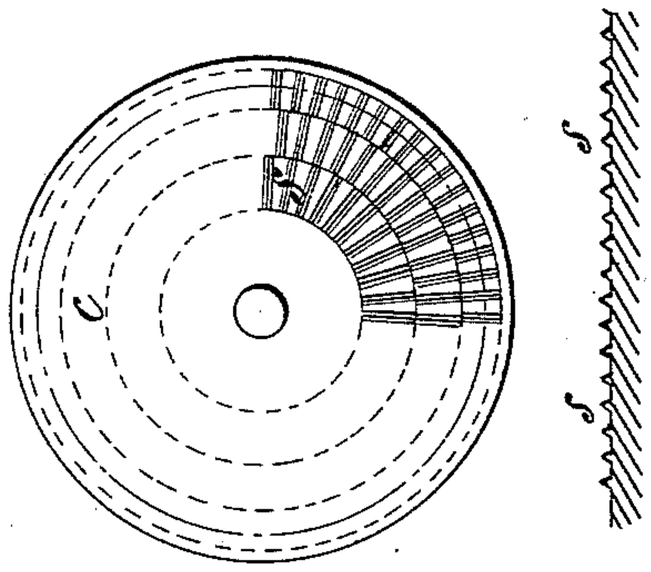




Fig. 2.

Fig. 3.



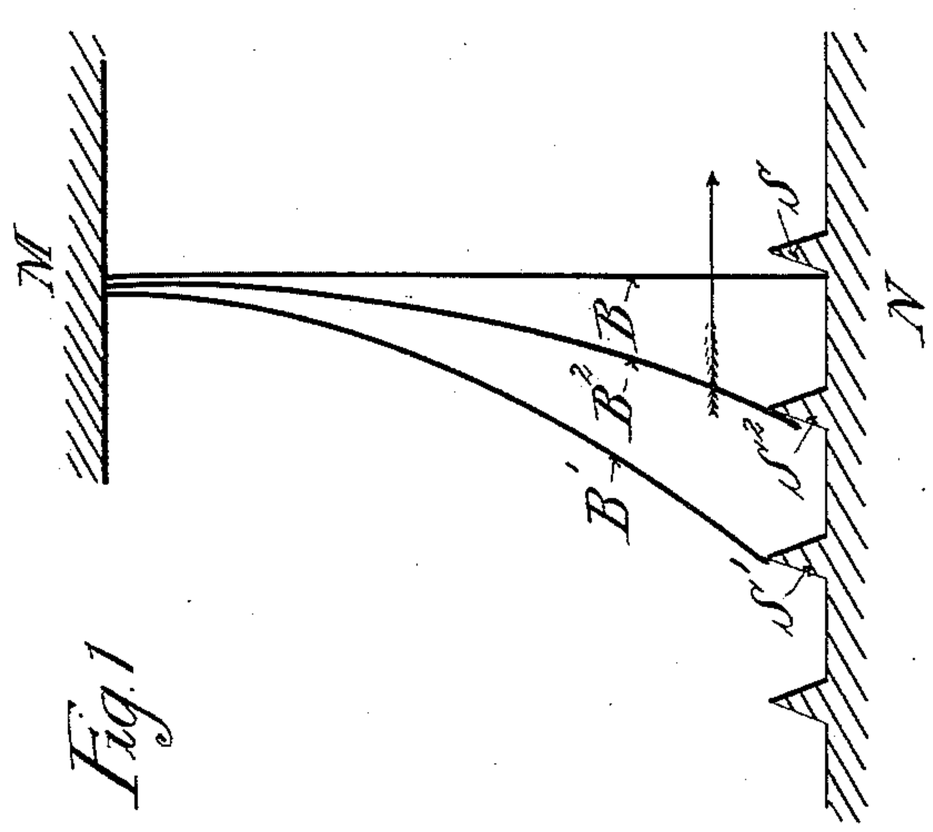
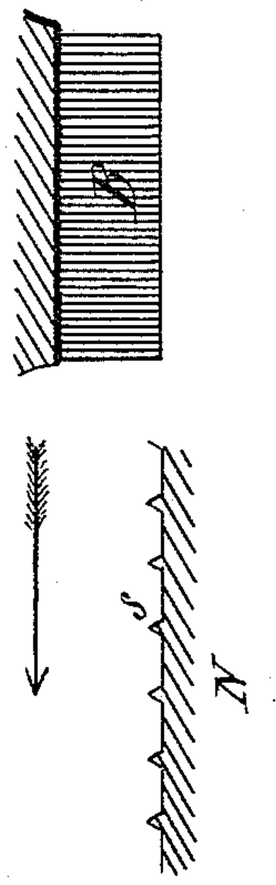




Fig. 1

Fig. 4.

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# UNITED STATES PATENT OFFICE.

RAYMOND SNYERS, OF BRUSSELS, BELGIUM.

## DEVICE FOR TRANSMITTING AND ABSORBING POWER.

SPECIFICATION forming part of Letters Patent No. 458,257, dated August 25, 1891.

Application filed November 13, 1888. Serial No. 290,752. (No model.) Patented in Belgium June 18, 1887, No. 77,630; in France August 16, 1887, No. 185,345, and in England August 19, 1887, No. 11,337.

*To all whom it may concern:*

Be it known that I, RAYMOND SNYERS, a subject of the King of the Belgians, residing at Rue Kerferweldt, Brussels, in the Kingdom of Belgium, have invented an Improved Mechanical Device for Transmitting and also Absorbing Power, (patented in Belgium June 18, 1887, No. 77,630; in France August 16, 1887, No. 185,345, and in England August 19, 1887, No. 11,337,) of which the following is a specification.

This invention relates to an improved mechanical device for transmitting and absorbing power, the power being transmitted from one body to another or absorbed by one body from another, the two bodies having either different speeds or equal speeds.

The essential elements of the improved device are two in number, the first being a collection of filaments, hereinafter called a "brush," and the second a surface indented or provided with parts in relief.

Figure 1 of the annexed sheet of drawings shows in diagrammatic form the relation of the two elements of the device, one filament only being shown, but in three positions. It will be seen that the part in relief S has for its object to form an obstacle to the filament B and to force the latter to bend if the body M changes its position with relation to the body N; but in bending the filament develops a certain reaction or force, which reacts upon the elevation S so as to push it in the direction of the arrow F. In practice I do not employ a single filament having the requisite stiffness to transmit or absorb the required power; but, on the contrary, I employ a large number of elastic filaments—that is to say, I divide the power to be transmitted or absorbed into a number of small fractional portions. The whole of all these filaments constitute a device similar to a brush. The object of this division is to obviate all shock when the transmission or absorption of power is effected between two bodies having different velocities. For this reason the division must be carried out to an extent which will be the greater, the greater the difference of velocity between the said bodies. If a large number of filaments act all at once, although each one can only exert a slight effort, their simultaneous action is capable of producing considerable efforts. The indented surface, which serves to bring about the simultaneous action of all the filaments, is therefore designated an "integrator"—a name which clearly indicates its function. The filaments of the brush act similarly to small spring-blades. Their first requirement is therefore to be flexible and elastic—that is to say, when the filament B is diverted from its neutral position B it tends to return thereto of its own accord. Apart from this essential condition, the material or shape of the filament is of little importance. However, in most of the applications of this method of transmitting and absorbing power it is preferable to construct the filaments of steel or bronze. The indented surface may be formed in any suitable manner—such as by ribs, grooves, corrugations, and the like—and may assume any form which will cause the filaments of the brush to bend. Thus the rungs of a ladder, the spokes of a wheel, or nails fixed in a board, may easily serve the same purpose. The essential quality of the integrating device is that it will produce the simultaneous deflection of the greatest possible number of the elastic filaments of the brush.

On referring to Fig. 1 it will be seen that the filament B bends more and more till it is in the position B′, ready to escape from the projection S′, in order to come in contact with the projection $S^2$. When in the position B′, the filament is bent most and exerts its greatest effort. This bending of the filament will be the greater the deeper the filament penetrates between the projections. The deeper the brush is depressed between the projections S, the greater the force which it will transmit.

Figs. 2, 3, 4, and 5 show several examples of the improved device arranged to transmit and to absorb power.

Apparatus for transmitting power may be classed, generally, under the name of clutches and apparatus for absorbing power under the name of "brakes." They are essentially the

same. In a clutch the relatively quicker-moving body is able to overcome the resistance of the slower-moving body and put it in motion or increase its motion, while in a brake the relatively slower-moving body is able to oppose a superior resistance to the quicker-moving body and reduce or annul its motion.

A clutch according to this invention for transmitting power for such a purpose as connecting or disconnecting two sections of shafting, or a fast and a loose pulley, consists of a disk D, Fig. 2, upon which are fixed the brushes B. This disk is retained on the shaft A by a fixed key, and may by means of a lever L be moved nearer to or farther from another disk C keyed upon the shaft A′. The surface of C is provided with roughened parts S, Fig. 3, suitably distributed to serve as an integrator—that is to say, to produce the simultaneous flexure of all the filaments B. When the two disks are placed in contact in such a manner that the filaments B can penetrate between the projections S, the disk C will be gradually drawn in rotation and will finally acquire the same velocity as the disk D. It is clear that the opposite result can be obtained by the same means—*i. e.*, that the disk D may be at rest and be put into rotation by the disk C; or, further, that one of the disks C or D may be applied to a loose pulley, which becomes fixed upon the shaft by the action of the other disk keyed upon the shaft.

The improved device may be applied to transmitting motion in many other different ways. For instance, the brush or the integrator may be attached to a body propelled or impelled at a very high velocity—such as, for instance, a locomotive, the shuttle of a loom, &c.—and this body in its passage may actuate another body N, such as a fixed device on the track, a part of the mechanism of the loom, &c., to which the integrator or the brush would be applied. Such an arrangement is as shown in Fig. 4. The filaments of the brush B are deflected in succession against the projections S. Then the brush passes beyond the piece N and the filaments come successively out of contact with the integrator; but the reactive force of the brush is such that in the very short moment of contact of the brush with the integrator S the brush has been able to impart motion to the latter.

As already stated, this device may be applied as a brake. Fig. 2 serves to show its operation as a brake as well as a clutch. If the disk C be fixed so that it cannot be drawn into rotary movement by the disk D, it is clear that the disk C will act as a brake in relation to the disk D, either to diminish its velocity or to stop it altogether. If the disk D be attached to the wheel of a vehicle and the disk C be hung from the frame of the vehicle, the disk C will act upon D as a brake to diminish its speed, whatever may be the nature of the mechanism employed to effect the operation of causing the disks C and D to move nearer to or farther away from each other.

The arrangement of clutch shown in Fig. 4 will equally well act as a brake. If the brush or integrator be applied to a body M having a certain velocity and which at a given moment comes in contact with an integrator or a brush attached to a fixed body N, then, if the latter is not capable of being drawn along by the moving body or if its mass is large enough relatively to the movable mass to be but slightly influenced by the motion of the latter, it is clear that if the reactive force of the brush upon the integrator is suitably proportioned its effect will be to reduce the velocity of the body M or to stop it altogether. Such is the case of a brush applied to the cage of a hoist or elevator and arranged to come at the moment of rupture of the suspending-rope in contact with an integrator fixed to the guides or guiding frame-work. The brush will then open out laterally and act as a "parachute-brake" to stop the cage.

Fig. 5 shows the improved device arranged as a brake. The weight P is suspended from a rod T, and is capable of sliding from top to bottom or from bottom to top along the said rod, while remaining in equilibrium at any point. The rod is provided with suitably-arranged projections, and to the weight are fixed one or more brushes B in permanent contact with the integrator. The reaction of the bent filaments suffices to maintain the weight in equilibrium; but if an additional force be applied, such as force exerted by the arm of a person, the filaments undergo their maximum deflection, and pass along, jumping from one projection to the other.

What I claim is—

1. A device suitable for transmitting power and also for counteracting power, comprising a surface having projections or parts in relief and a collection of elastic filaments or strips, the said filaments being brought to bear upon the said projections or parts in relief, producing thereupon by their deflection a force or resistance, substantially in the manner herein specified.

2. A device for transmitting and for counteracting power, having two surfaces, one of which is provided with elastic filaments arranged in the fashion of a brush, and the other is a rigid surface formed with projections and depressions, in combination with each other and with mechanism for bringing the two surfaces into contact and causing them to move one relatively to the other, creating great force or resistance by the repeated deflections of the elastic filaments by their successive contacts with the said projections, substantially as herein specified.

3. A device for transmitting power and also

for counteracting power, comprising a collection of elastic filaments or strips similar to a brush, combined with a body or disk having a corrugated, indented, or equivalent surface with parts in relief, adapted to simultaneously deflect a number of said filaments, substantially in the manner herein specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RAYMOND SNYERS.

Witnesses:
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