No. 632,944. Patented Sept. 12, 1899.

# B. JANSEN.

## POWER TRANSMITTING MECHANISM.

(Application filed Mar. 7, 1899.)

(No Model.) 2 Sheets—Sheet 1.

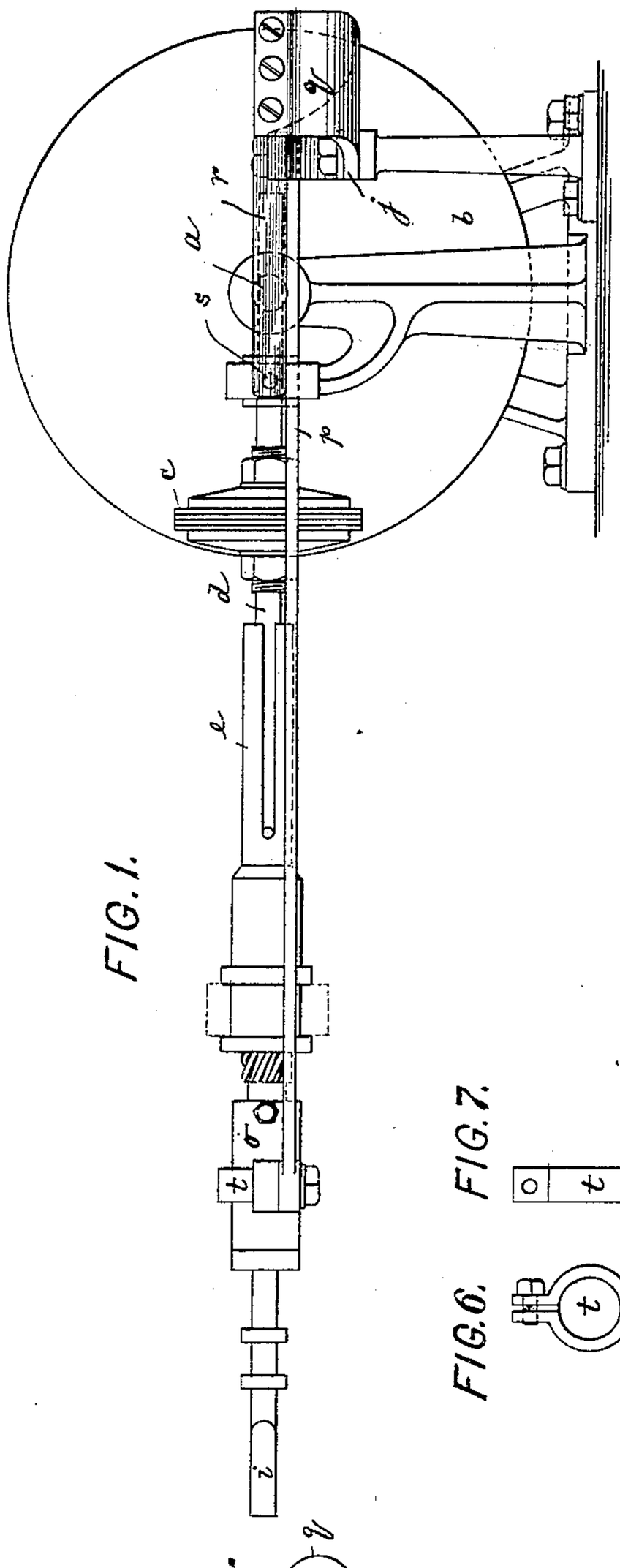


FIG. 1.

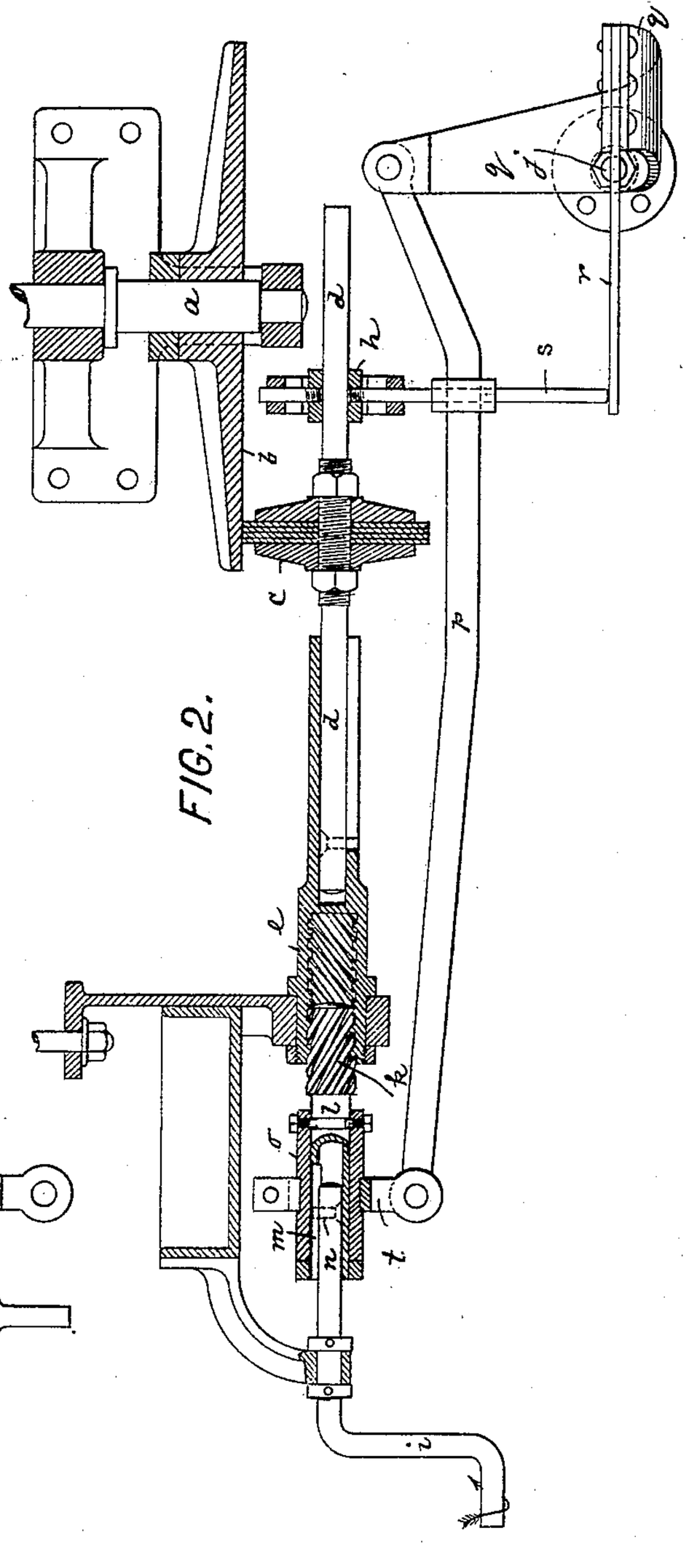


FIG. 2.




FIG. 6. FIG. 7.

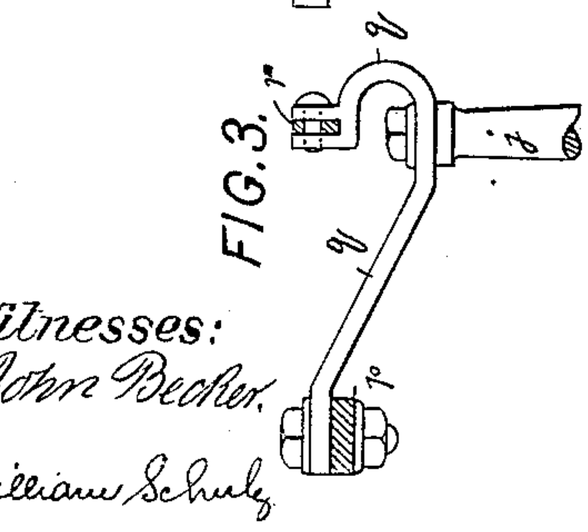


FIG. 3.

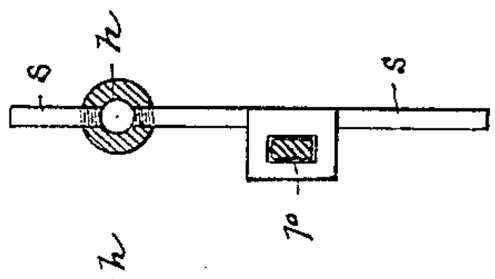


FIG. 5. FIG. 4.

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## POWER TRANSMITTING MECHANISM.

(Application filed Mar. 7, 1899.)

(No Model.) 2 Sheets—Sheet 2.

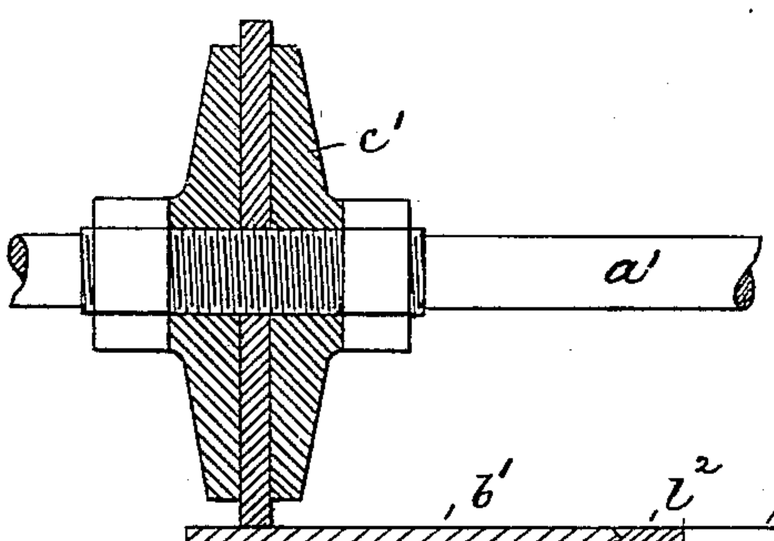



FIG. 8.

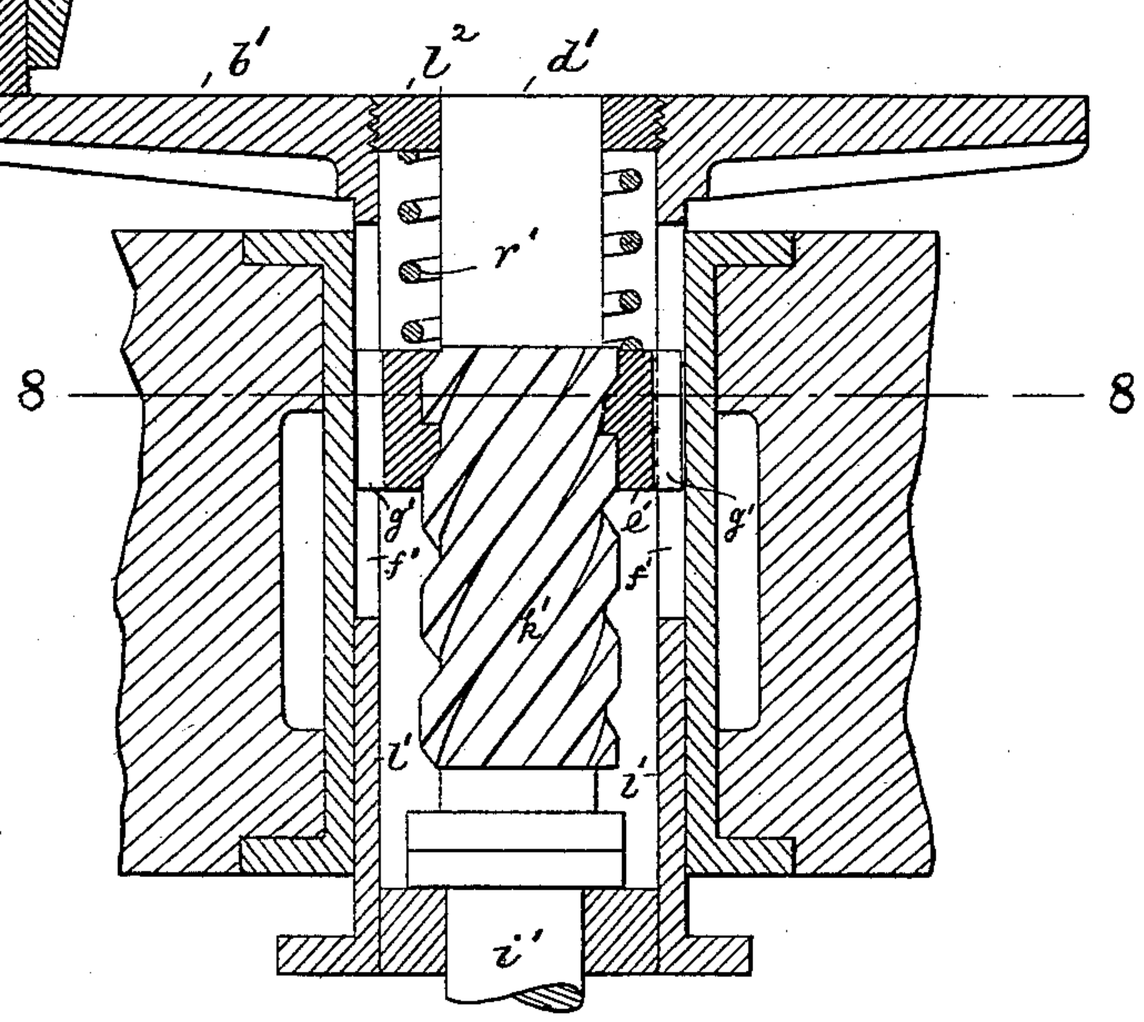



FIG. 8a

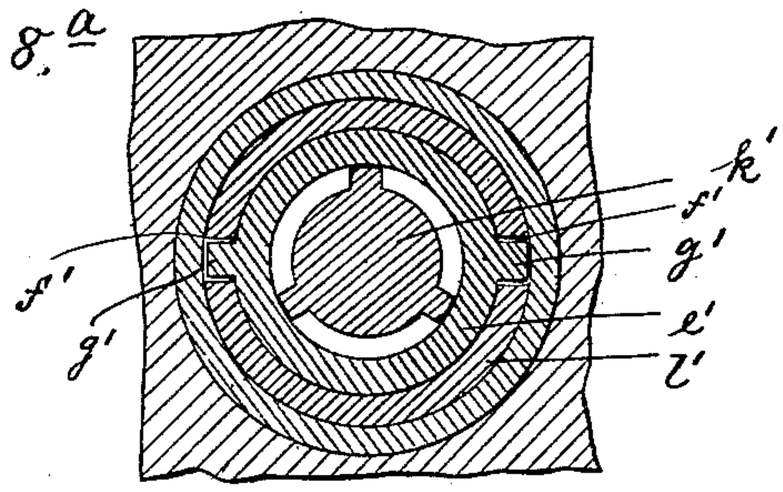



FIG. 9.

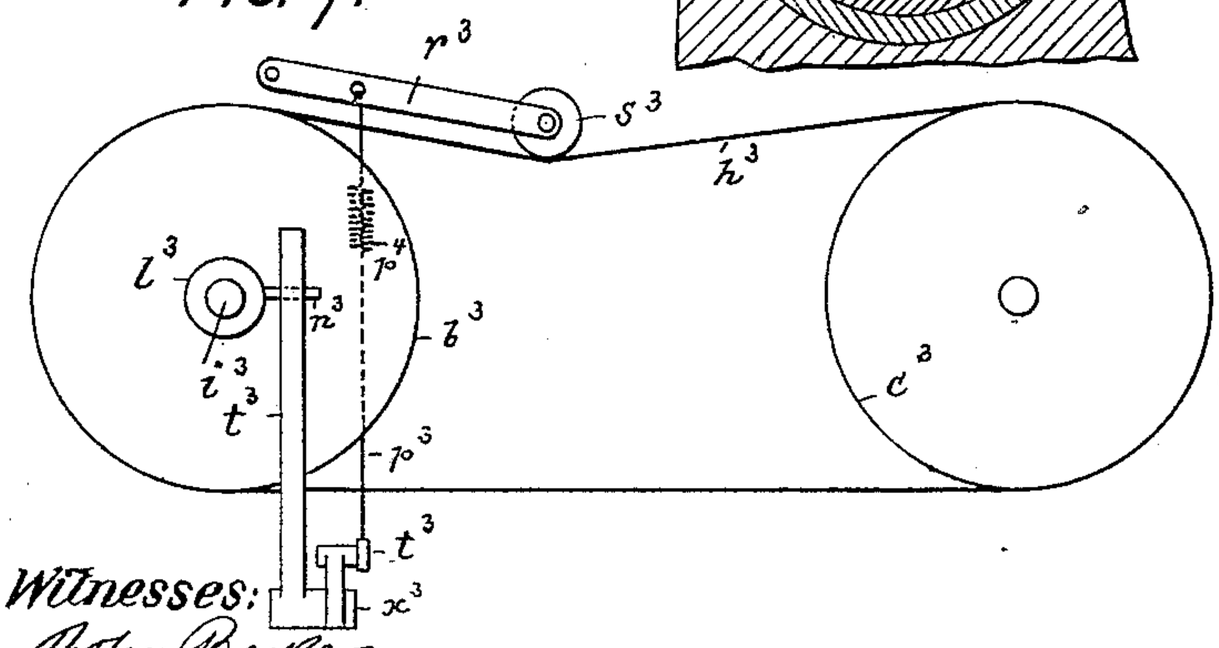
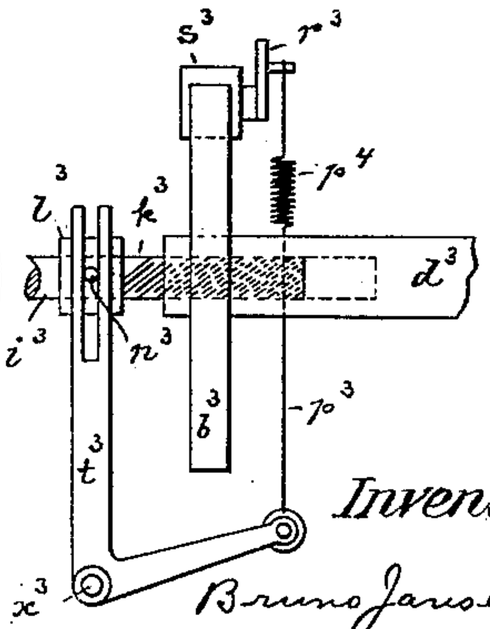



FIG. 10.

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John Becker.
William Miller.

Inventor:
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# UNITED STATES PATENT OFFICE.

BRUNO JANSEN, OF AUGSBURG, GERMANY.

## POWER-TRANSMITTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 632,944, dated September 12, 1899.

Application filed March 7, 1899. Serial No. 708,089. (No model.)

*To all whom it may concern:*

Be it known that I, BRUNO JANSEN, a citizen of Germany, and a resident of Augsburg, Germany, have invented certain new and useful Improvements in Power-Transmitting Mechanism, of which the following is a specification.

When with the known friction-wheel transmissions the power is suddenly changed, a gliding between the wheels at the point of transmission will take place, because the contact-pressure is too small. To avoid this defect, a contact-pressure for both wheels would have to be selected, which would frequently exceed the maximum pressure necessary for the transmission. This unnecessarily high pressure also necessitates a stronger construction of the entire mechanism, causes rapid wear, and must be suffered during the normal operation, where it is not at all required and where it produces an increased pressure on the journals.

The present invention relates to an improved arrangement by which during a change of power by sudden thrusts, &c., the contact-pressure of the two friction-wheels is also changed, that it is increased during an increase of pressure, and vice versa, so that it will always correspond to the height of the pressure to be transmitted Thus during a normal operation an excessive pressure will be avoided; but at a change of power or during sudden thrusts a sliding of the wheels will not take place.

The accompanying drawings illustrate different embodiments of the invention.

Figure 1 is a side elevation of the transmitting mechanism; Fig. 2, a longitudinal section thereof. Figs. 3 to 7 illustrate various details. Fig. 8 illustrates a modification in which the friction-disk is pressed against the friction-roller. Fig. $8^a$ is a cross-section on line 8 8, Fig. 8; Fig. 9, a side elevation of a further modification, showing it adapted to belt transmission; and Fig. 10, a front view thereof.

In Figs. 1 to 7 the letter *a* represents the shaft, to which motion is to be transmitted by means of the friction-disk *b* and roller *c*. The shaft *d*, carrying the friction-roller *c*, is journaled at one end in a movable bearing *h*, the position of which determines the degree of pressure between the parts *b c*. The other end of the shaft *d* is provided with a socket or nut *e*, having a steep thread which is engaged by a screw *k* of corresponding pitch. The screw *k* is provided with a socket *l*, that receives the driving-shaft *i*, such shaft having a pin *n*, that engages a slit *m* of the socket *l*, so that the shaft will drive the screw *k*. The shafts *i* and *d* are guarded in their bearings against lateral displacement, so that they can only rotate.

The socket *l* is embraced by a sleeve *o*, which does not participate in the rotation of the socket, but is moved endwise during the longitudinal shifting of the same by means of the engagement of a pin in a circular groove of the socket. The sleeve *o* is by rod *p* connected to a two-armed lever *q*, turning on shaft *j* and carrying at its free end a spring-arm *r*. The connection between the parts *p o* is effected by a clasp *t*, surrounding the sleeve. The lever *q* is so mounted and shaped that during a shifting of the parts *l o* the spring *r* will press upon a pin *s*, which is connected to the bearing *h* of shaft *d*, and in this way the roller *c* will be forced against the friction-disk *b* to increase the degree of frictional contact. As long as the driving power remains constant the shaft *i* will drive the screw *k*, and the latter will drive shaft *d* without causing the screw to advance within the socket *l*, as these parts are held back by the resistance of bearing *h* and pin *s*. The spring *r* is, however, held under such tension that by it the roller *c* is pressed against the disk *b* to correspond to the power to be transmitted. If a greater power is to be transmitted or if the power-shaft *i* receives suddenly stronger impulses or thrusts, this shaft will rotate quicker than shaft *d*, so that the screw *k* will be screwed into the nut *e*, longitudinally moving the sleeve *o*. This displacement of the sleeve toward the left, Fig. 2, will by rod *p* effect a stronger tension of spring *r*, which in turn will bear more firmly upon pin *s* to move the bearing *h* toward disk *b* and increase the contact-pressure of roller *c* against such disk, so as to prevent slipping between these parts. If the power is decreased or if the thrusting impulse is removed, the screw *k* will screw out of nut *e*, and the contact-pressure is by the recession of the parts again

diminished, so that during the normal operation the requisite pressure only will always be maintained.

In Figs. 8 and 8ª the friction-disk $b'$ is mounted upon shaft $d'$, while the friction-roller $c'$ transmits the power to shaft $a'$. To adjust the contact-pressure, the friction-disk $b'$ is provided with a sleeve $l'$, movable in its bearing. The screw $k'$ is mounted upon the shaft $d'$ and is engaged by a nut $e'$, having ribs $g'$, that engage slots $f'$ of sleeve $l'$. Between the nut $e'$ and a shoulder $l^2$ of sleeve $l'$ is arranged a coiled spring $r'$. The nut $e'$ is by spring $r'$ and the pitch of screw $k'$ influenced to so adjust itself that the disk $b'$ is pressed against roller $c'$ with the requisite degree of pressure. The nut $e'$ will drive the sleeve $l'$ and disk $b'$, and the latter will transmit motion to shaft $a'$ by roller $c'$. If the power of shaft $i'$ is increased, the nut $e'$ will move upon screw $k'$, as the shaft $d'$ is not movable longitudinally, and thus the tension of spring $r'$ will be increased to increase the contact-pressure between the parts $b'$ $c'$.

In Figs. 9 and 10 the shaft $d^3$, carrying the driving-pulley $b^3$, is connected to the driving-shaft $i^3$ by the screw $k^3$, the relative position of these parts being determined by a spring (not shown) which is put under tension in proportion to the power to be transmitted. For this construction the arrangement shown in Figs. 1 and 2 or in Fig. 8 may be adopted. Upon shaft $i^3$ a sleeve $l^3$, having pin $n^3$, is so mounted that it is moved longitudinally by the shaft when the latter is shifted, but will not participate in the shaft's rotation. The pin $n^3$ engages the forked end of a bell-crank $t^3$, turning at $x^3$, and having its shorter arm connected to a draw-bar or similar device $p^3$. This bar connects the bell-crank $t^3$ with a pressure-lever $r^3$, carrying at its end a belt-tightener $s^3$, that determines the tension of the belt $h^3$, by which the power is transmitted to the pulley $c^3$. In order to maintain the tension of the belt constant and to prevent the regulating mechanism from acting when, for instance, the joint of the belt passes the tightener $s^3$, a spring $p^4$ may be inserted in the draw-bar $p^3$.

The operation is as follows: If by reason of a change in the power to be transmitted the screw is screwed in, the sleeve $l^3$ will be shifted toward the right, Fig. 10. The bell-crank $t^3$ will by rod $p^3$ and lever $r^3$ press the tightener against the belt $h^3$, so that the tension of the belt is increased. If the power to be transmitted is diminished, the tension of the belt is decreased by the decreased pressure of tightener $s^3$ and the bearings will be partly relieved of the pressure resulting from the tension of the belt.

What I claim is--

1. In a power-transmitting mechanism, the combination of a nut with a screw adapted to be driven into the nut by an increased application of power, and means operated by the screw for adjusting the pressure between the parts of the transmitting mechanism in accordance with the position of the screw, substantially as specified.

2. In a power-transmitting mechanism, a pair of friction-disks in contact, combined with a movable bearing for supporting one of said disks, a screw influenced by the power-shaft, and means actuated by said screw for adjusting said bearing and the frictional contact between the disks in accordance with the power to be transmitted, substantially as specified.

3. In a power-transmitting mechanism, the combination of a shaft with a screw, a nut engaged thereby, a spring for maintaining the parts in their normal position, and a pair of friction-disks, the tension of the spring being adapted to be changed by the position of the screw, to press the friction-disks together in proportion to the degree of power to be transmitted, substantially as specified.

4. The combination of a friction disk and roller with a shaft, a screw engaging the same, a movable bearing for the shaft, a second shaft engaging the screw, a longitudinally-movable sleeve actuated by the screw, and means for connecting said sleeve with the movable bearing, substantially as specified.

5. The combination of a friction disk and roller with a shaft, a screw engaging the same, a movable bearing for the shaft, a second shaft engaging the screw, a longitudinally-movable sleeve actuated by the screw, a lever connected to the sleeve, a spring-arm secured to the lever, and a pin engaged by the spring-arm and connected to the movable bearing, substantially as specified.

Signed by me at Munich, Bavaria, this 21st day of February, 1899.

BRUNO JANSEN.

Witnesses:
HELL PHILOMINA,
EMIL HENZEL.