

G. S. FOUTS.

DRIVE WHEEL FOR ELEVATORS, CARRIERS, OR THE LIKE.

No. 540,158.

Patented May 28, 1895.

Fig. 1

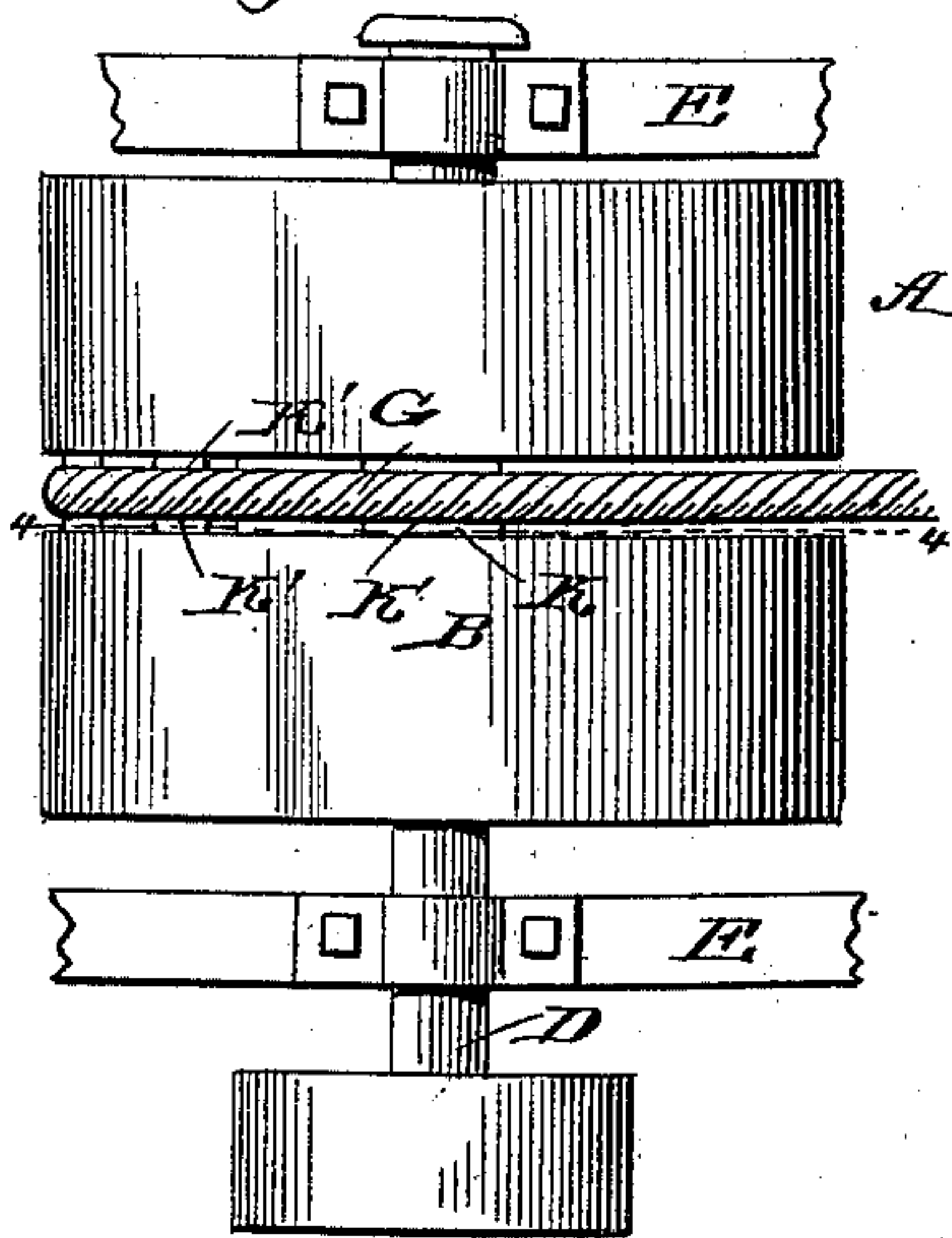


Fig. 2.

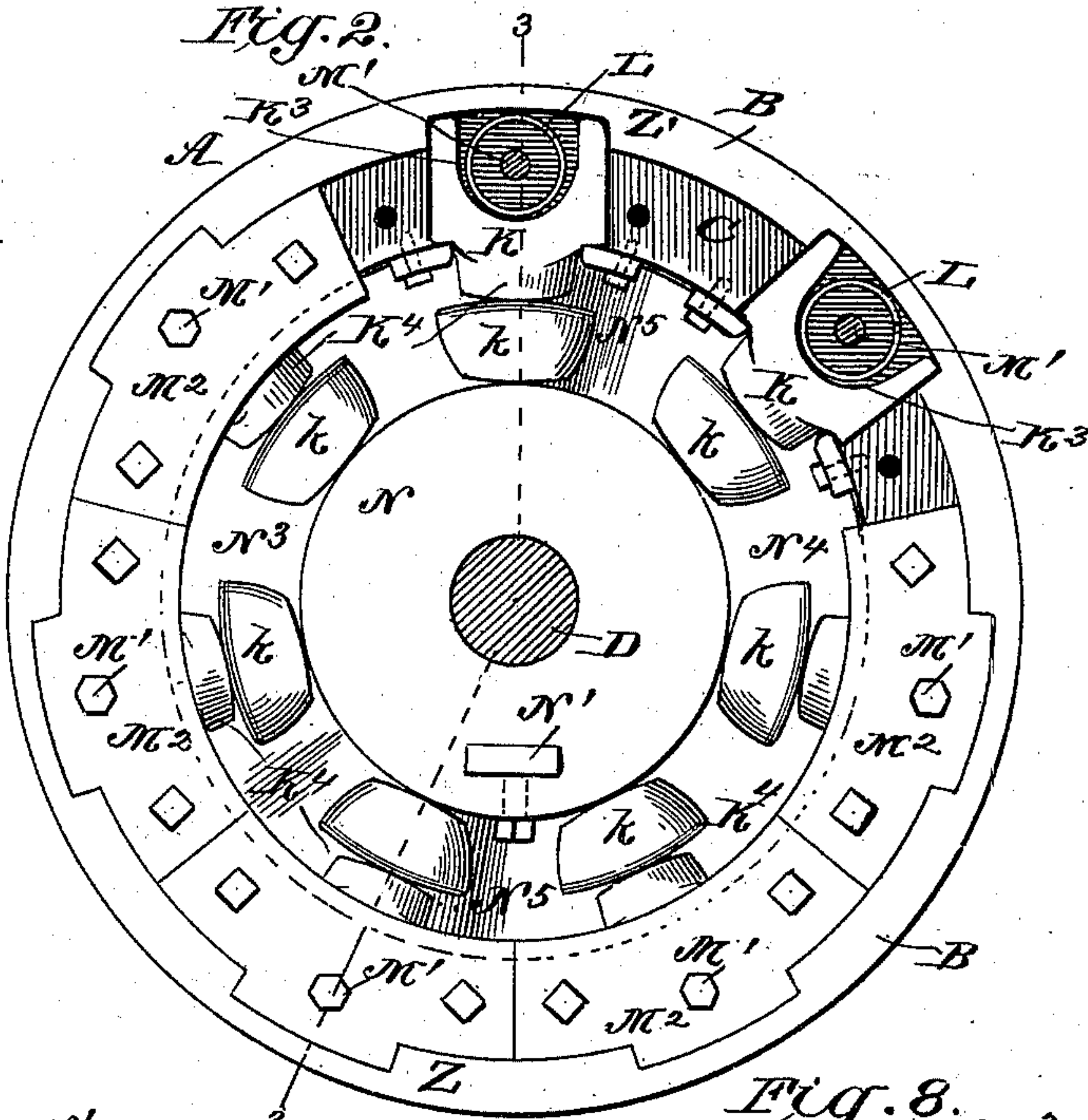


Fig. 5.

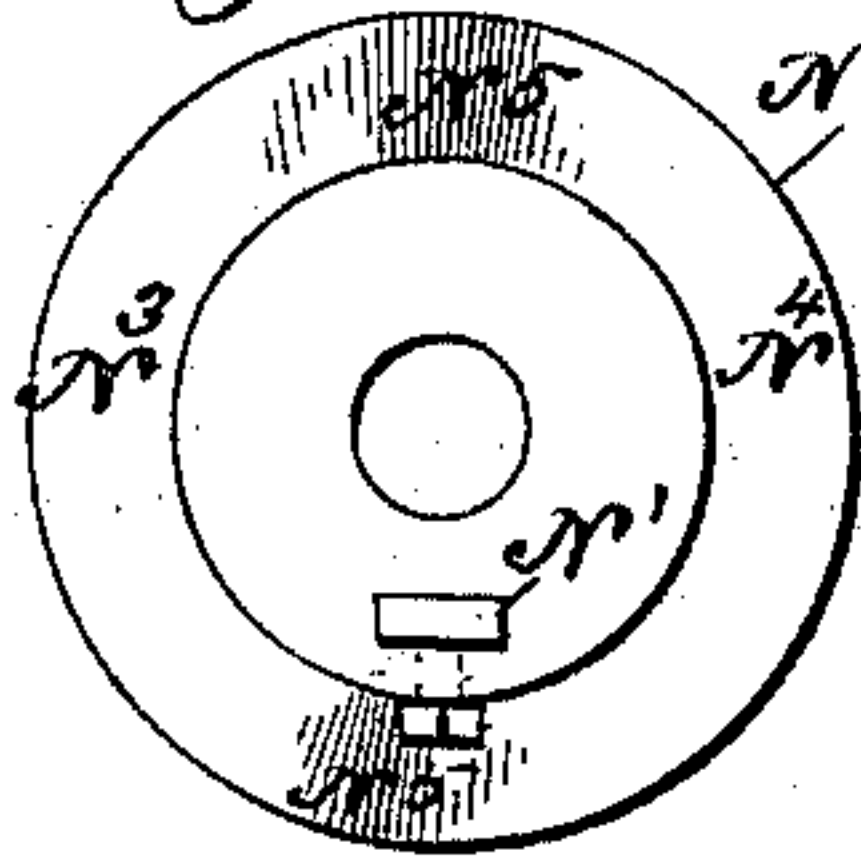


Fig. 6.

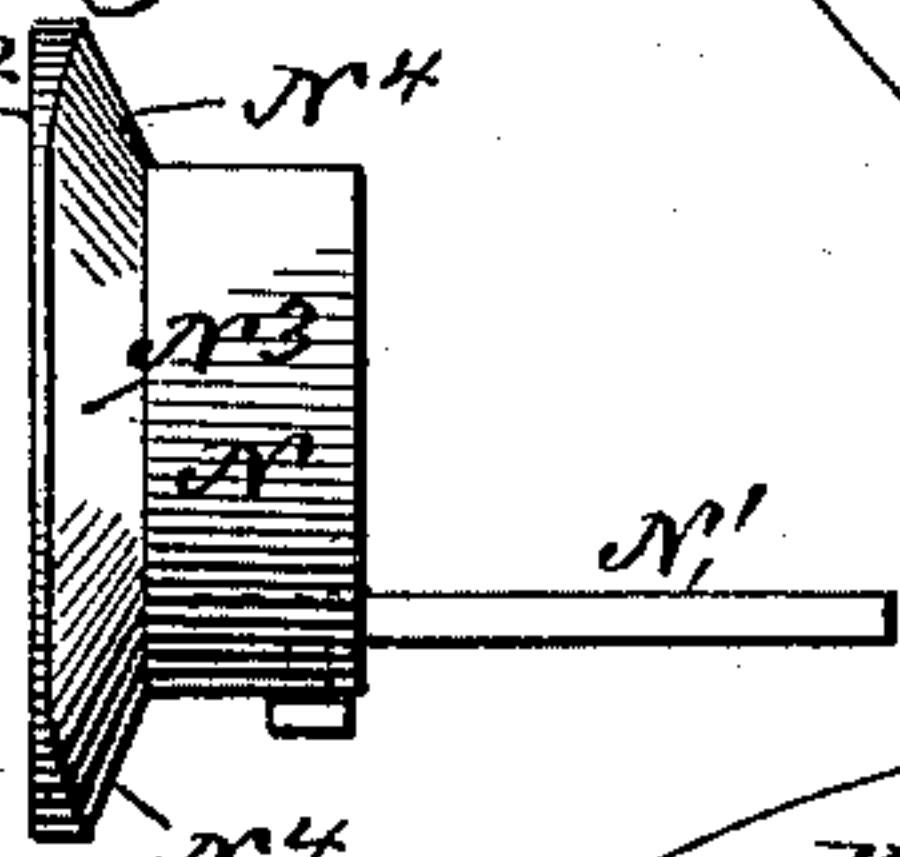


Fig. 7.

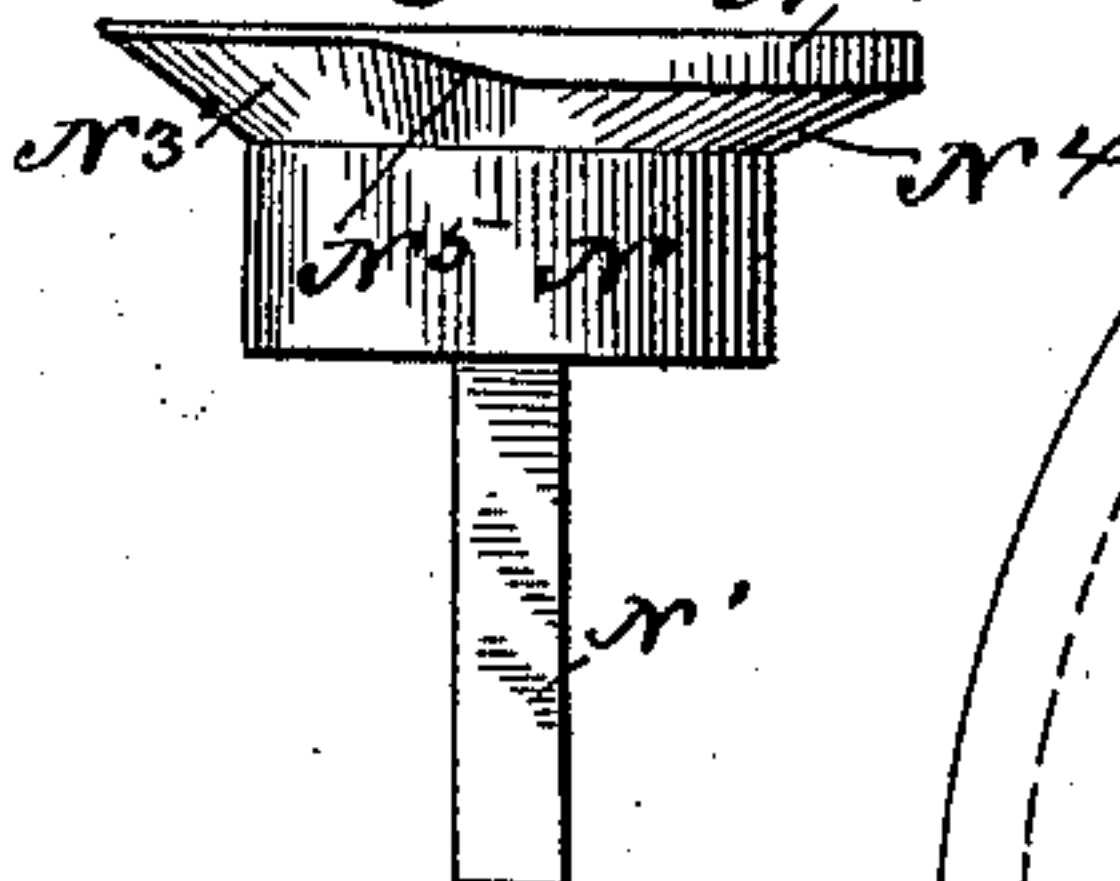


Fig. 4.

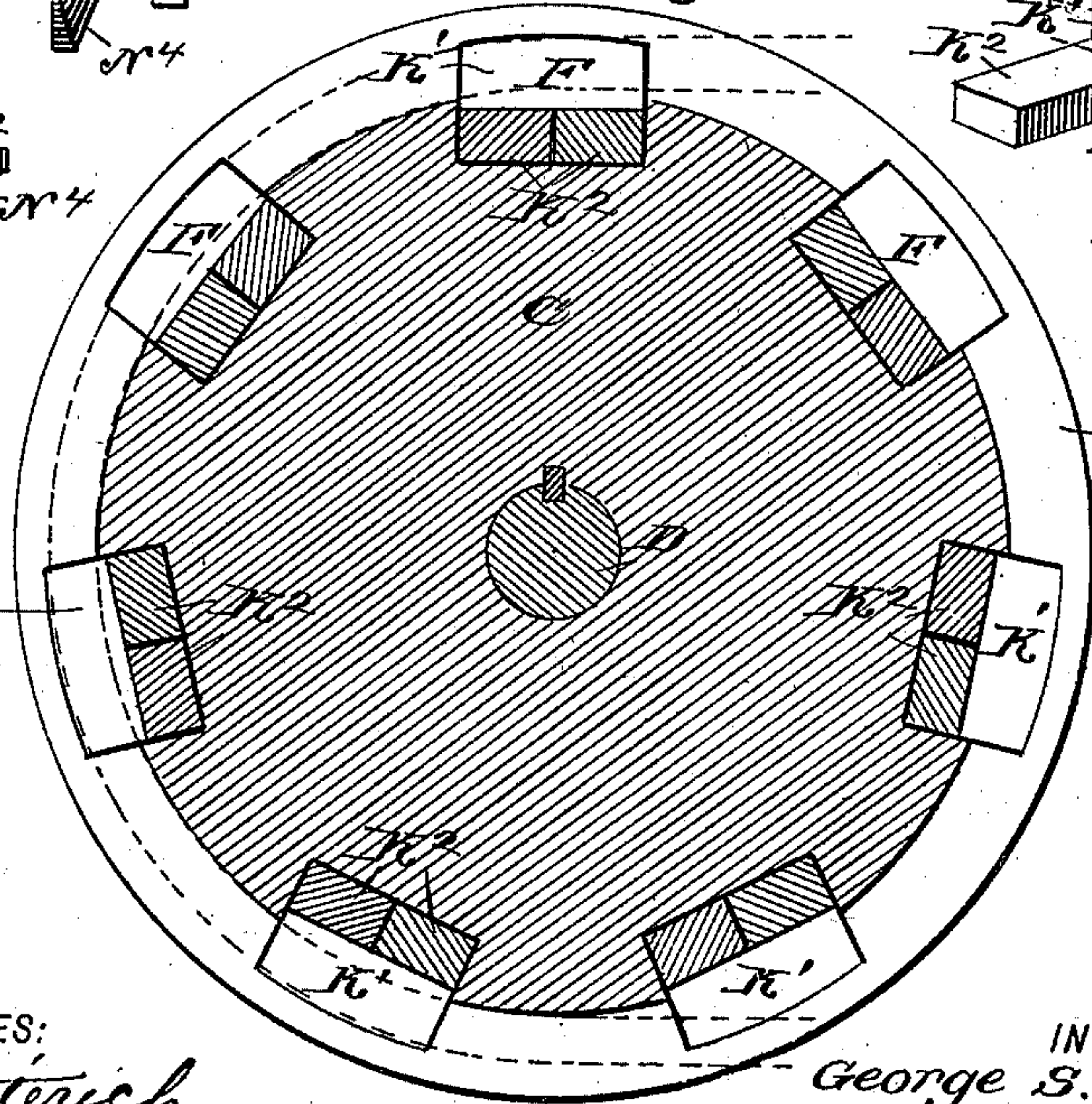
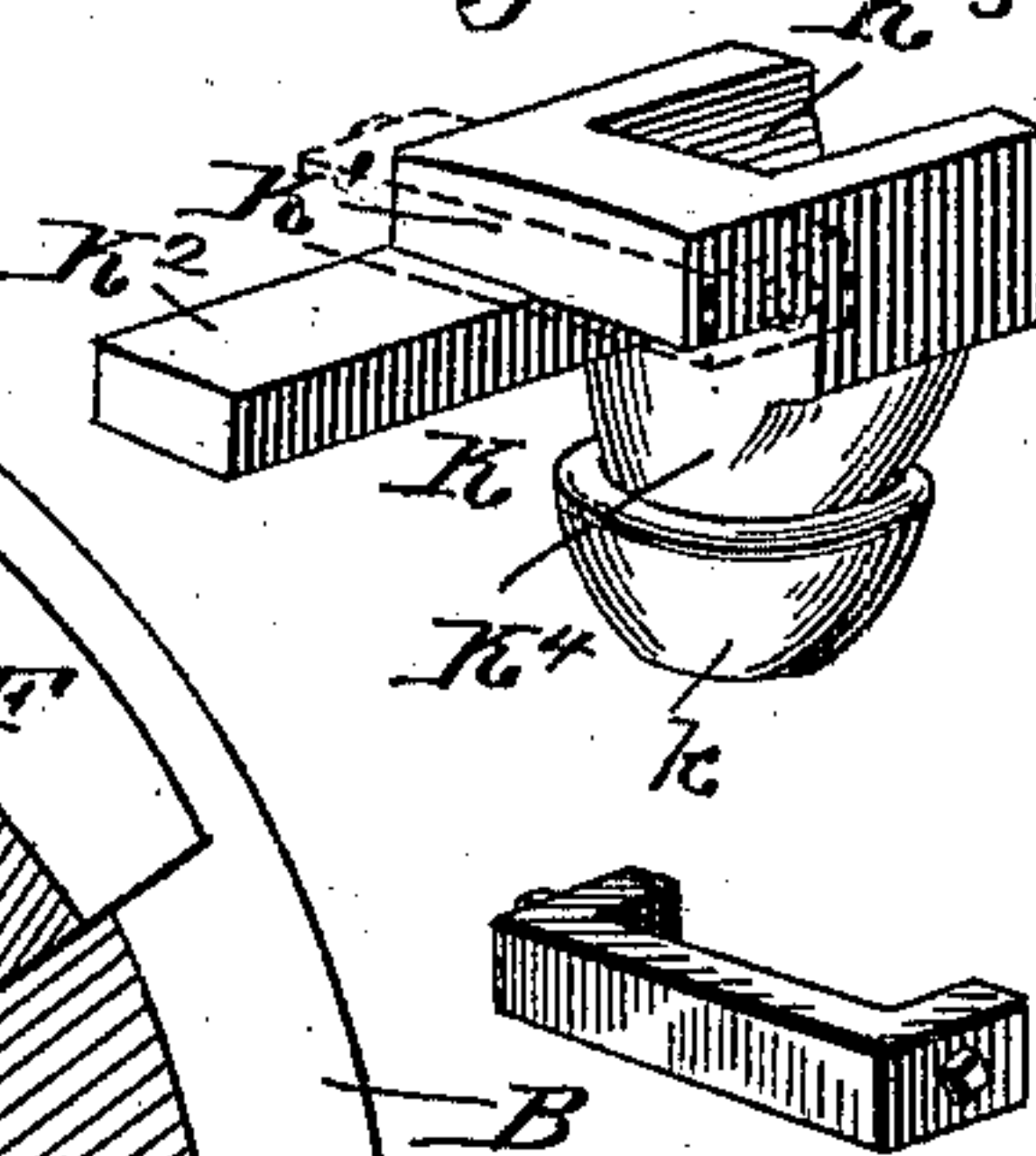


Fig. 8.



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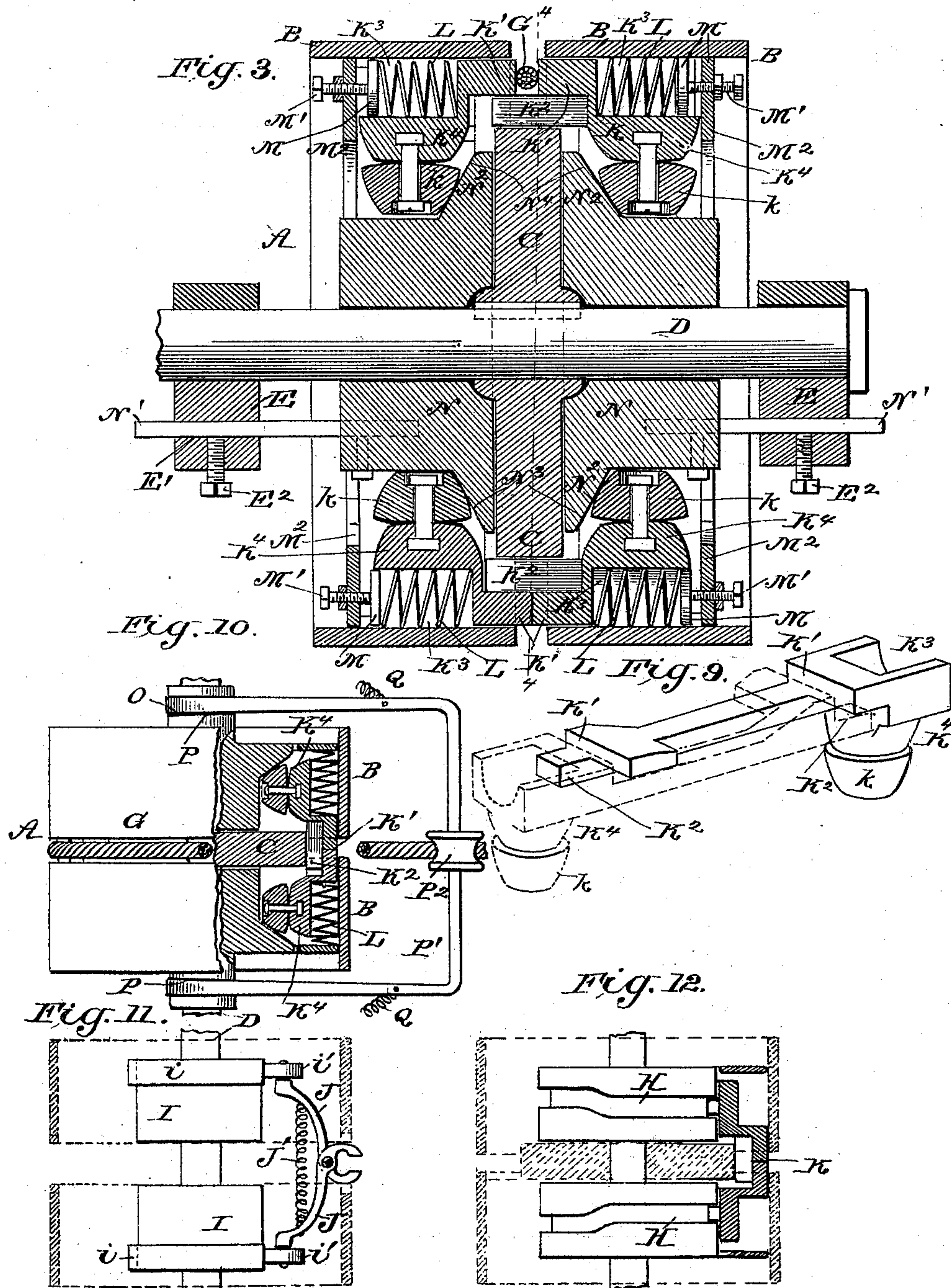
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

GEORGE S. FOUTS, OF SAN JOSÉ, CALIFORNIA.

DRIVE-WHEEL FOR ELEVATORS, CARRIERS, OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 540,158, dated May 28, 1895.

Application filed February 13, 1895. Serial No. 538,217. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. FOUTS, residing at San José, in the county of Santa Clara and State of California, have invented a new and useful Improvement in Driving-Wheels for Elevators, Carriers, and the Like, of which the following is a specification.

This invention is an improvement in driving wheels for elevators and other carriers, and for other uses where it is desired to drive a rope, cable or other band for any desired purpose.

The invention is especially designed to provide means whereby the cable may be strongly gripped when desired and may adjust itself to carrier flights or other projecting portions on the cable or to sticks or other obstructions that may occur upon the cable and between the same and the band clamping sections.

The invention has for further objects to provide means whereby the clamping sections may be moved positively in one direction.

The invention has for further objects other improvements and consists in certain novel constructions, combinations and arrangements of parts as will be hereinafter described and pointed out in the claims.

In the drawings, Figure 1 is a top plan view of my improved wheel, portions of the framing being shown. Fig. 2 is a side view of the wheel, two of the side bearing-plates being removed. Fig. 3 is a transverse section on about line 3 3, Fig. 2. Fig. 4 is a section on about line 4 4 of Fig. 3. Figs. 5, 6, and 7 are detail views of the cam-block. Fig. 8 is a detail view of one of the clamping-sections. Fig. 9 is a detail view representing a construction of clamping-sections designed for driving two bands side by side, and Figs. 10, 11, and 12 show constructions differing in some respects from each other and from the construction shown in Figs. 2 and 3.

My driving wheel as shown comprises a pulley A which has a rim B and a web C, the web C being keyed or otherwise secured to the shaft D, and such shaft being journaled in the frame E which manifestly may be of any suitable construction. This pulley A carries the clamping sections, which are movably connected or supported by said pulley so they may move into and out of binding contact with the cable G, the purpose being to permit

said cable to move freely between such sections as it moves into contact with the wheel and then to cause such sections to be pressed together or upon such cable during a portion of the revolution of the wheel to transmit positively to such cable the motion of the wheel and to drive the cable without any slipping of same upon its drive wheel. In doing this, I provide cam devices by which to actuate the clamping devices in one direction.

In the construction shown in Fig. 12 I provide cam devices in the nature of stationary cam grooves H, which tend to actuate the clamping devices in both directions, and in Fig. 11, the cam devices are provided upon the circumference of a fixed block I, such cams engaging with rolling bearings i' on pivoted clamping devices J, whose clamping surfaces operate with a shearing action, as will be understood from said figure. In this construction shown in Fig. 11, a spring J' tends to draw the clamping devices J into contact with the cable, the cams operating to release the clamping devices from the cable and to maintain them spread in position to free the upper run of the cable and to subsequently receive between them the lower run of the cable.

In the construction shown in Figs. 2 and 3, the clamping devices are composed of pairs of sliding pieces K having clamping surfaces K', provided in advance of said clamping surfaces with overlapping extensions or portions K², which are provided with spring recesses and have inwardly projecting portions K⁴ for engagement by the cam surfaces by which the sliding pieces K are positively operated in one direction. These clamping pieces K operate in suitable guideways in the pulley rim B and the sections of each pair are so arranged that their clamping surfaces K' are caused to bind upon opposite sides of the cable during certain portions of the travel of the pulley, this being preferably effected by means of springs L seated in the recesses K³ bearing between the inner wall of such recess and a suitable stop and compressed so they will tend to force the spring sections inward. The stop for the outer ends of spring L comprise followers M supported on screws M' turning through removable face plate sections M². By this construction the tension of the springs may be

varied and ready access may be gained to any one of such springs and its clamping section by removing the corresponding face plate section M^2 .

5 In this construction it will be seen that the springs tend to actuate the clamping sections into binding contact with the cable; and to move them in the opposite direction, I provide cam devices so related that in the arrangement shown in Fig. 2 the cam sections
10 when they reach a point about Z, will be spread apart to receive the cable, will then be freed so the springs may press them into binding contact with the cable and will be main-
15 tained in such binding contact until they reach the point about Z' when they will again be forced apart to release the cable.

It should be understood that the arrangement of the cam devices to bind and release
20 the clamping sections, may be varied in any case to suit the direction in which the cable is lead into and passes out of engagement with the driving wheel.

In the construction shown in Figs. 2, 3, 6
25 and 7 the cam devices are provided upon or form parts of cam blocks N which are fixed to the supporting frame or otherwise held from turning with the pulley. As preferred this is effected by means of projecting bars
30 or arms N' on the cam blocks, entering openings E' in the frame, the arms N' being preferably secured adjustably in said openings by means of screws E² so the cams may be ad-
35 justed to spread the clamping sections apart to different degrees as may be desired to adapt the driving wheels to cables of different sizes as will be readily understood.

The cams proper are in the construction shown in Figs. 3, 5, 6 and 7 composed of radial ribs N² on the inner ends of the cam
40 blocks N, such ribs having their outer sides provided with the portions N³ and N⁴ connected by the abrupt inclined shoulders N⁵, whereby the clamping sections are directed
45 from the portion N³ out on to the portions N⁴ and then back onto the portion N³.

It will be seen that when the projections K⁴ of the clamping sections are riding upon the portions N³ of the cam devices, the springs
50 will be permitted to press such clamp devices into binding contact with the cable and that such binding contact will continue until the portion K⁴ rides up the shoulders N⁵ onto the portion N⁴ thus spreading the clamping sec-
55 tions apart in which position they will be held until the next shoulder N⁵ is reached when they will again be permitted to move inward onto the cam portion N³. The inwardly projecting portion K⁴ of the clamping sections
60 may preferably be provided with an anti-friction roller k to press against the cam surface of the cam block. As will be understood from Figs. 3 and 4, the inwardly projecting portions K² project below the path of the cable in all
65 positions of the said sections and thus operate

to maintain the cable in proper relation to the clamping surfaces K'.

It should be understood that in elevating and carrying devices it is important that the cable clamping devices may be adapted to
70 permit the introduction between them of parts larger than the diameter of the cable, and yet provide for tightly clamping such cable for driving purposes. For such reasons the construction wherein a spring is provided to press
75 the clamping sections into binding contact may be preferred; but where greater driving power is desired to be exerted upon a cable free of carrier portions or projections, the construction shown in Fig. 10 may be preferred.
80 In this construction, the cams are reversed and arranged to bear upon the outer instead of the inner sides of the projections K⁴ and the springs L are connected in such manner as to exert an outwardly drawing tension upon
85 the clamping sections, the operation being as follows: The cams tend to force the clamping sections into positive binding contact with the cable, while the springs draw them out of such contact, such operation being practically a
90 reversal of that effected by the construction shown in Fig. 3, as will be understood from a comparison of Figs. 3 and 10.

In the construction shown in Fig. 10 it is sometimes desired to vary the degree of pressure
95 exerted by the clamping sections upon the cable, and this may be effected by supporting the cam blocks therein shown to move in or out, providing at the outer side of such cam blocks, cams or inclines O, engaged by cams
100 P on a bail P' journaled or pivoted upon the shaft D extending over the cable and having a pulley P² bearing above the cable as shown. The cams O and P are so related to each other and to the bail P', which is pressed down-
105 wardly by springs Q, that as the bail is drawn upward against the tension of springs Q, the cam blocks will be forced inward, such inward pressure of the cam blocks increasing with the upward movement of the bail P'. Thus in
110 operation the tension of springs Q upon bail P' will cause such bail to press the upper run of the cable down out of its taut alignment. Then as strain is exerted on said cable it will tend to straighten, and thus exert a lifting
115 tendency on the bail P' so that the greater the strain on the cable, the more strongly will the cam blocks operate to press the clamping sections into contact with the cable.

In the construction shown in Fig. 9, the two
120 clamping sections of the pair are shown as provided each with two clamping surfaces, the purpose being to adapt such clamping sections to secure two cables where it is desired to drive two cables with the same wheel. It
125 is manifest that the clamping surfaces of the pairs may be increased as may be desired.

In dotted lines Fig. 8, and in the detail view immediately below Fig. 8 I show a removable
130 surface for the rope clamping sections which

can be replaced in case of wear or injury without necessitating the replacing of the entire section. Manifestly this removable wear surface may be made in different forms and secured in various ways as may be desired.

Having thus described my invention, what I claim is—

1. A drive wheel, comprising a revolving pulley having a support, and clamping sections movable in said support toward and from each other, combined with opposite cam surfaces held from turning and arranged to operate the clamping sections, substantially as set forth.

2. A drive wheel, composed of a revolving pulley, clamping sections both movable in said pulley toward and from each other, and fixed cam surfaces one for each clamping section and arranged to operate the same, substantially as set forth.

3. A drive wheel, composed of the framing, the shaft, the pulley fixed to the shaft and provided with the clamping sections both movable toward and from each other and opposite stationary cam surfaces one for each clamping section such surfaces extending around the shaft, all substantially as and for the purpose set forth.

4. The combination of the frame, the pulley revolving therein, the clamping sections movably supported by said pulley and the cam like abutments fixed with respect to the frame and arranged to operate the clamping sections, substantially as and for the purposes set forth.

5. A drive wheel comprising a revolving pulley having rope or band clamping sections, springs operating said sections in one direction and cam like abutments operating said sections in the opposite directions, the said cam like abutment being held from turning with the pulley, substantially as and for the purposes set forth.

6. A driving wheel comprising the revolving pulley, the rope or band clamping sections movable transversely in a direction parallel to the axis of said pulley into and out of clamping position and means for operating said clamping sections, substantially as and for the purposes set forth.

7. A driving wheel comprising a pulley, the clamping sections movable transversely into and out of clamping position and provided with mortises or recesses leading from their ends and actuating springs operating in said mortises or recesses, substantially as set forth.

8. A driving wheel comprising a revolving pulley, the removable clamping sections supported by said pulley, the cam blocks held from turning with the pulley and having the cam portions or abutments, the projections or portions on the inner sides of the clamping sections bearing outside the cam portions and springs actuating said clamping sections in

opposition to the cams, substantially as and for the purposes set forth.

9. In a driving wheel, the transversely movable clamping sections arranged in pairs, the sections of each pair being formed at their inner adjacent ends with clamping surfaces and with overlapping guide portions and means whereby to operate said clamping sections, substantially as set forth.

10. The combination of the rope or band clamping sections, the cam blocks, the frame having openings, the arms or bars projecting from the cam blocks into the openings in the frame and clamps securing the said arms or bars in the frame openings whereby to secure the clamp blocks adjustably, substantially as set forth.

11. The combination of the shaft, the web portion keyed to such shaft and a rim portion, the rope or band clamping sections supported by said rim and movable into and out of clamping position and the cam portions or abutments arranged on opposite sides of the pulley web and engaging and operating the clamp sections, substantially as and for the purposes set forth.

12. A driving wheel comprising the pulley the clamping sections having clamping surfaces and provided in their outer ends with recesses, the springs bearing in such recesses, the follower for the outer ends of such springs and adjusting devices for said followers, all substantially as and for the purposes set forth.

13. In a driving wheel, the transversely movable clamping sections arranged in pairs, the sections of each pair being provided at their inner ends with clutching surfaces and also with overlapping guide surfaces and provided in their outer ends with sockets, the springs fitting in said sockets, means for adjusting the tension of such springs and the cam surfaces or abutments operating said sections in opposition to the springs, all substantially as and for the purposes set forth.

14. The improvement in drive wheels herein described consisting of the shaft, the framing, the shaft journaled therein, the pulley having web portions keyed on the shaft and a rim portion provided with ways, the clamping sections movable in said ways having interlapping guide portions at their inner meeting ends, springs by which said sections may be pressed inward, the cam blocks on opposite sides of the pulley web and connections between said cam blocks and the frame, whereby said blocks are held from turning with the pulley, all substantially as and for the purposes set forth.

GEORGE S. FOUTS.

Witnesses:

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 SOLON C. KEMON.