

(No Model.)

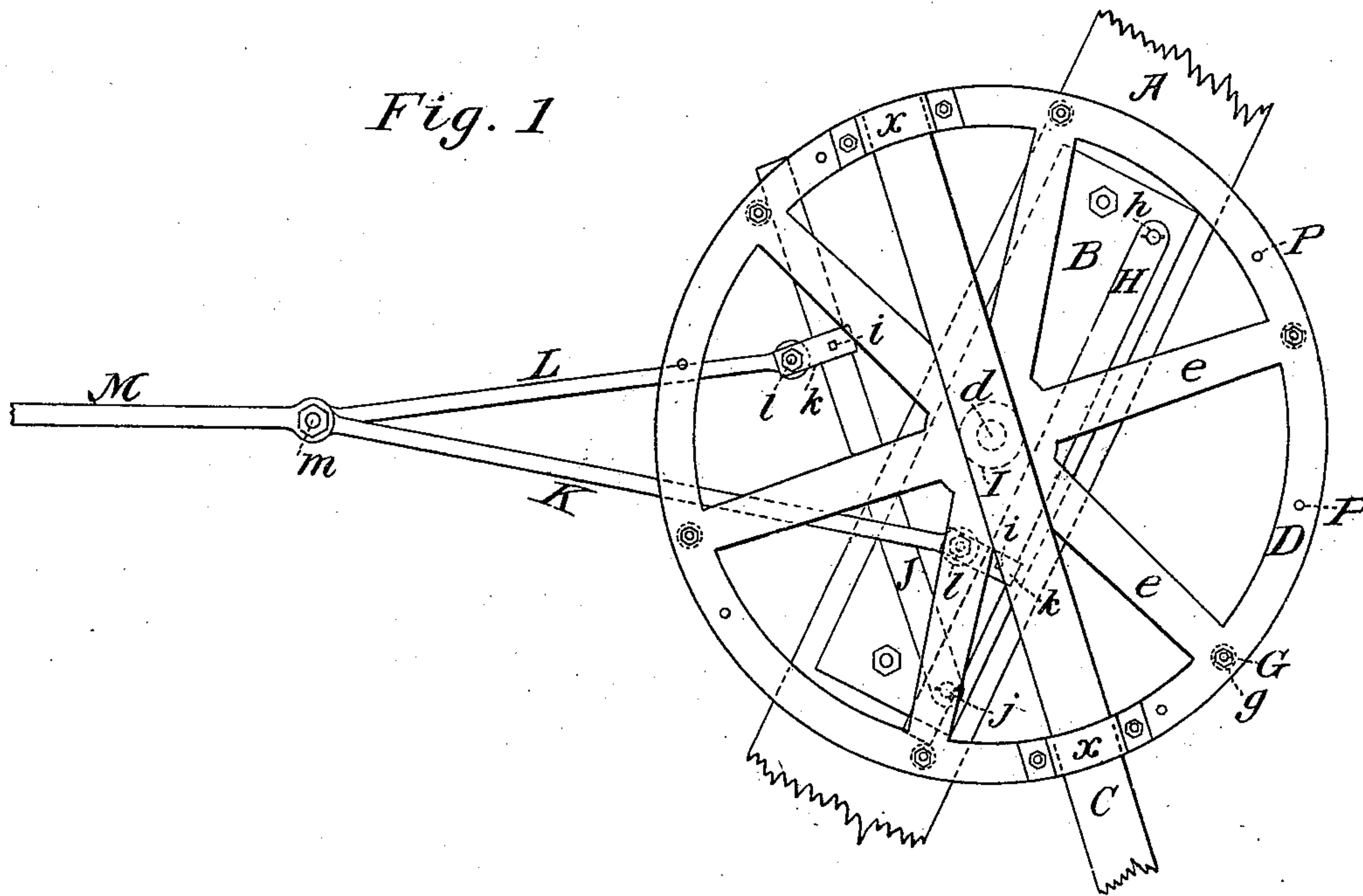
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N. & J. WAGNER.  
POWER MECHANISM.

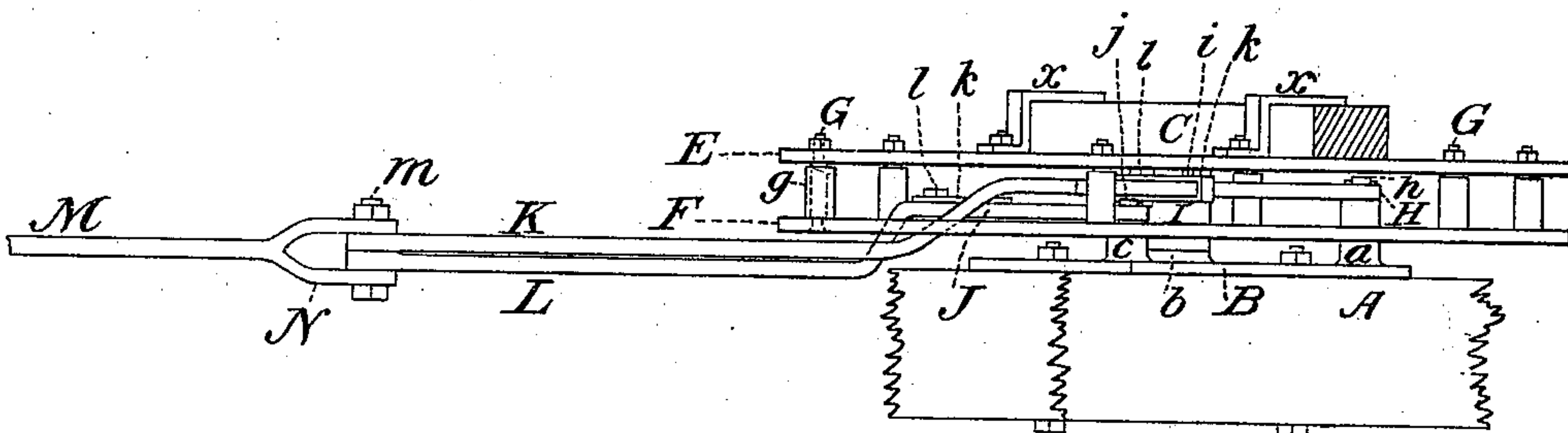
No. 544,757.

Patented Aug. 20, 1895.

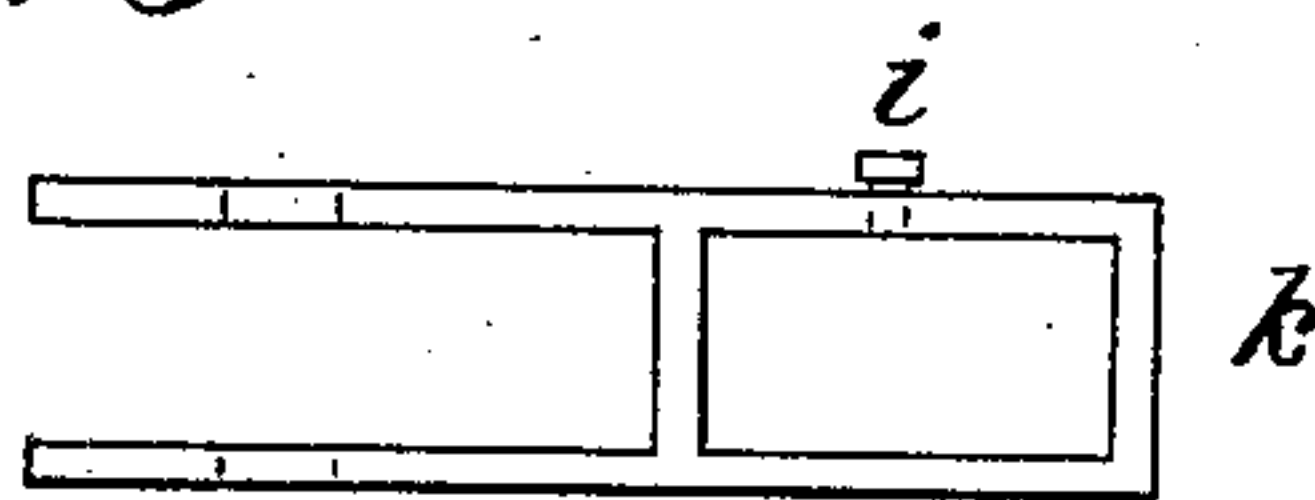
*Fig. 1*



*Fig. 2*



*Fig. 3*



*Witnesses*

George K. Reeder.

C. German.

Jacob Wagner,  
Nicholaus Wagner,  
*Inventors,*

per Edward P. Ruesz  
Attorney.

(No Model.)

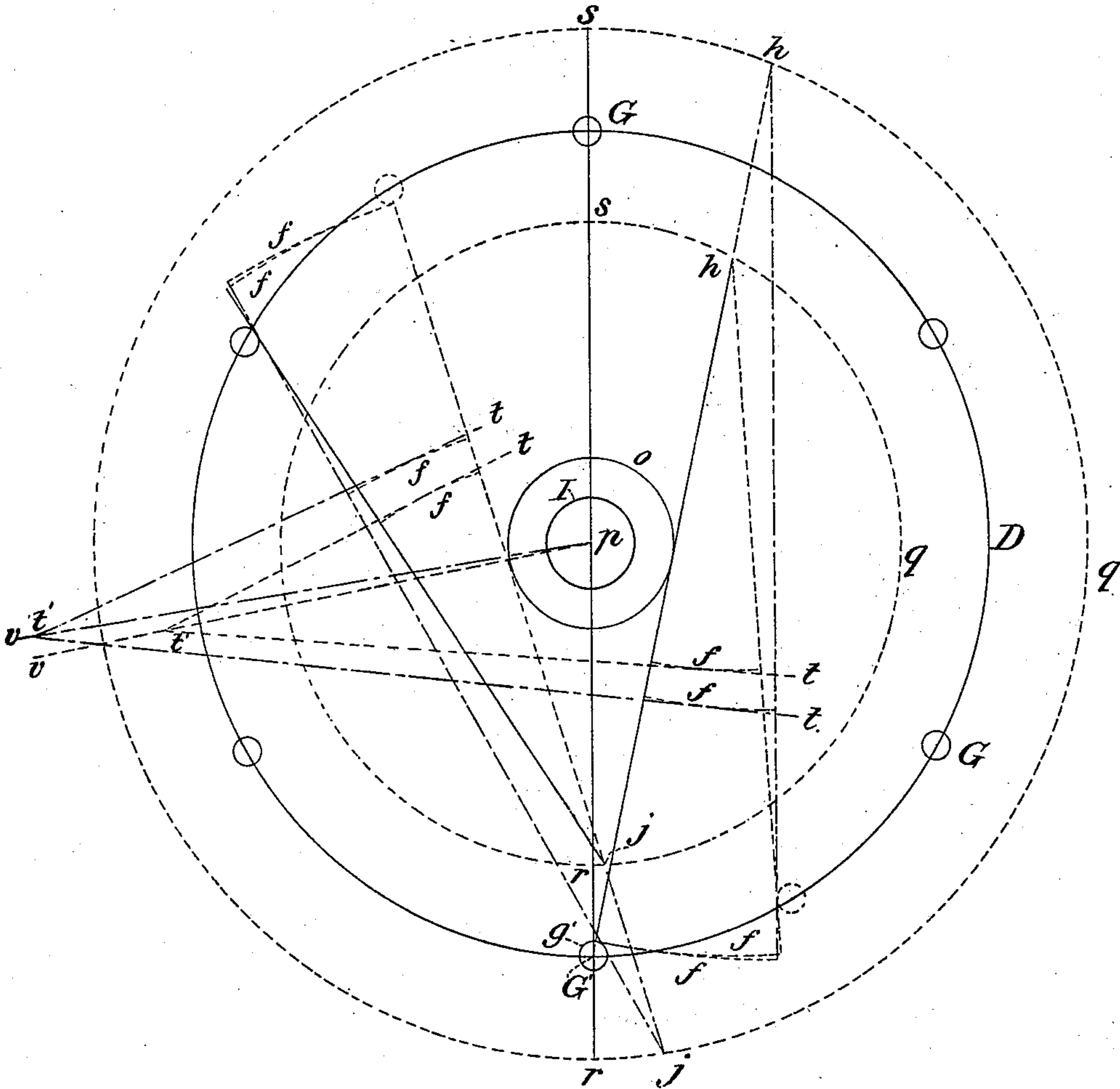
2 Sheets—Sheet 2.

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POWER MECHANISM.

No. 544,757

Patented Aug. 20, 1895.

*Fig. 4*



*Witnesses*

*George H. Reeder.*

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# UNITED STATES PATENT OFFICE.

NICKOLAUS WAGNER AND JACOB WAGNER, OF HELENA, MONTANA.

## POWER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 544,757, dated August 20, 1895.

Application filed October 18, 1894. Serial No. 526,259. (No model.)

*To all whom it may concern:*

Be it known that we, NICKOLAUS WAGNER and JACOB WAGNER, citizens of the United States, and residents of the city of Helena, county of Lewis and Clarke, State of Montana, have invented a new and useful Improvement in Power Mechanism, of which the following is a specification.

A simple, durable, and compact machine for converting rotary into reciprocating motion has been much needed, and our invention supplies this want.

It consists in a wheel, rotated by means of a sweep or otherwise, having pins on its circumference acting alternately on the free ends of two reciprocating levers, from which the reciprocating motion is conveyed to the desired point.

Figure I is a plan view of the machine. Fig. II is a side elevation. Fig. III is a side elevation of adjustable clamp. Fig. IV is a diagram of the movements involved.

Similar letters refer to similar parts in all the drawings.

A is the bed-piece, to which all parts are attached.

B is a metal base-plate securely fastened to the bed-piece A and having three raised bosses *a*, *b*, and *c*.

C is the sweep for applying horse-power, and is attached to the wheel by the braces.

D is the wheel, having a double rim. The upper rim E is strengthened by the spokes *e* and the lower rim F has no spokes. Between these rims are the pins G, even in number and carrying the rollers *g*. The wheel revolves on the pin *d*, which is secured in the boss *b*. The levers H and J are secured at one end to the pivots *h* and *j*, respectively, which in turn are secured in the bosses *a* and *c*, respectively. The levers are straight and of equal length. The rods K and L are fastened at one end to the levers H and J, respectively, by means of the clamps *k* and bolts *l*. These clamps *k* are movable along their respective levers and are adjustable in the desired positions by means of the set-screws *i*. The rods K and L are secured at their other end to the power-rod M by means of the bolt *m* and fork N.

The pivotal points *h* and *j* for the levers H and J, respectively, are selected in the fol-

lowing manner, (see Fig. IV:) Draw a diameter G'G across the wheel D from any pin G'. Describe a circle *o* around the center *p* of the wheel D with a radius equal to the radius of the hub I of the wheel D plus three-quarters ( $\frac{3}{4}$ ) of the width of the lever bar H, opposite this center *p*, plus a sufficient clearance. From the pin G' first mentioned draw a tangent G'h to this small circle *o*. Lay off on this tangent G'h from the inner circumference of the roller *g* on said pin G' the desired length of the lever H, (which should not be less than the radius of the wheel,) and there fix the first pivot *h*. Describe another circle *q* from the center *p* having a radius equal to the distance from the center *p* to the pivot *h*. This circle *q* will cut the diameter G'G at *r* and *s*. From the point on this circle *q* distant from *r* one-half the angular distance between two pins lay off upon the same side of the diameter G'G as is the pivot *h*, and toward said diameter, the same angular distance as is between the pivot *h* and said diameter at *s*. This will give the pivot-point *j*. The rods K and L may be joined at any point along the lines *v p* of resultant motion of the levers H and J. This line *v p* may be found by drawing tangents *t't* to the middle point of the arcs of travel *ff* described by the ends of the levers H and J (or of any two points along their respective lengths equidistant from their respective pivots) and bisecting the angle *n* of their intersection. It will also pass through the center of the wheel. The power will be best conserved and utilized by joining the rods at the point of intersection of the said tangents; but the machine will work if the junction be within or beyond that point along the line *v p* described. The boss *a* is higher than the boss *c*, to enable the lever H to pass over the lever J without interference. The rods K and L are bent in an elbow after passing under the rim of the wheel D to bring them into the planes of their respective levers H and J. (See Fig. II.)

The power, length, and rapidity of the stroke in the reciprocating rod may be varied in several ways—by changing the diameter of the wheel, by changing the number of pins, by changing the length of the levers, and by altering the position of the clamps on the levers. The number of pins and the position



of the attachment of the rods is adjustable without other change in the machine. Holes P may be prepared in the wheel-rims for the position of four pins or for eight, or more if  
5 desired.

The working of the invention will be readily seen from this description and the drawings. One lever is always being pushed by one of the pins, and just as one lever is released the  
10 other is engaged, thus producing a reciprocating motion in the rods, each lever being returned to its initial position on its arc of travel through its junction with the other. The strokes are equal in power and length.  
15 Being adjustable, they can be adapted to secure the best results from different pumps or blowers.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—  
20

1. In a power mechanism, the combination of a wheel, having pins on its circumference, set in one and the same plane, with two levers of equal length, separately fulcrumed,  
25 adapted to be acted upon alternately by said pins, and two operating rods, attached re-

spectively, one to each of the levers at one end, and jointly pivoted to a reciprocating rod at the other end, and the reciprocating rod, substantially as shown and described. 30

2. In a power mechanism, the combination of a wheel, having pins on its circumference, set in one and the same plane, and means for revolving said wheel, with two levers, separately fulcrumed and of equal length, 35 adapted to be acted upon alternately by said pins, and two operating rods, adjustably attached, one to each of said levers, respectively at one end, and jointly pivoted to a reciprocating rod, at the other end and the reciprocating lever, substantially as shown and described. 40

In testimony that we claim the foregoing as our invention we have signed our names, in presence of two witnesses, this 12th day of 45 October, 1894.

NICKOLAUS WAGNER.  
JACOB WAGNER.

Witnesses:

J. H. MURPHY,  
EDWARD C. RUSSEL.