

(No Model.)

2 Sheets—Sheet 1.

J. GRIMME.
DRIVING MECHANISM.

No. 561,260.

Patented June 2, 1896.

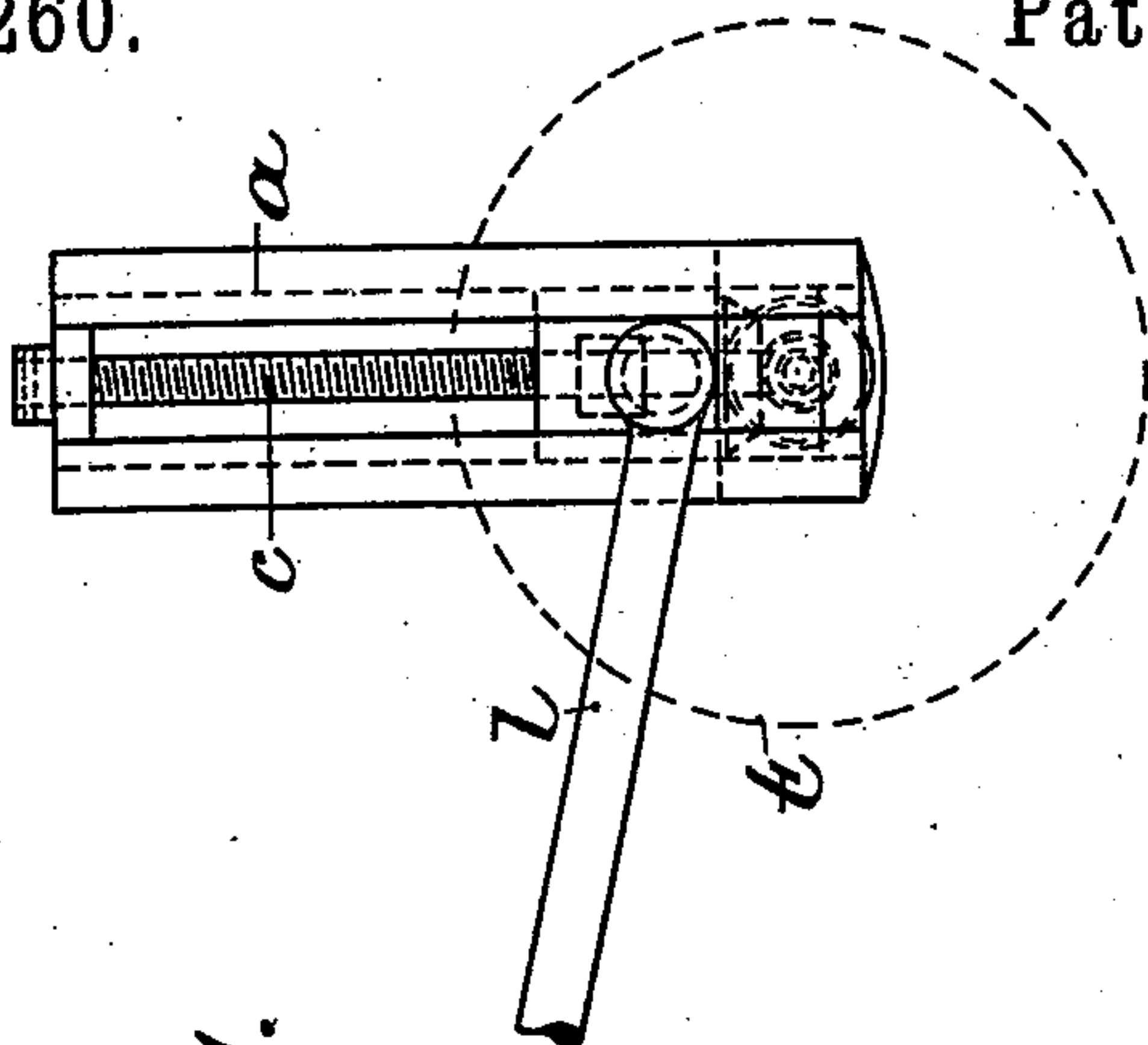
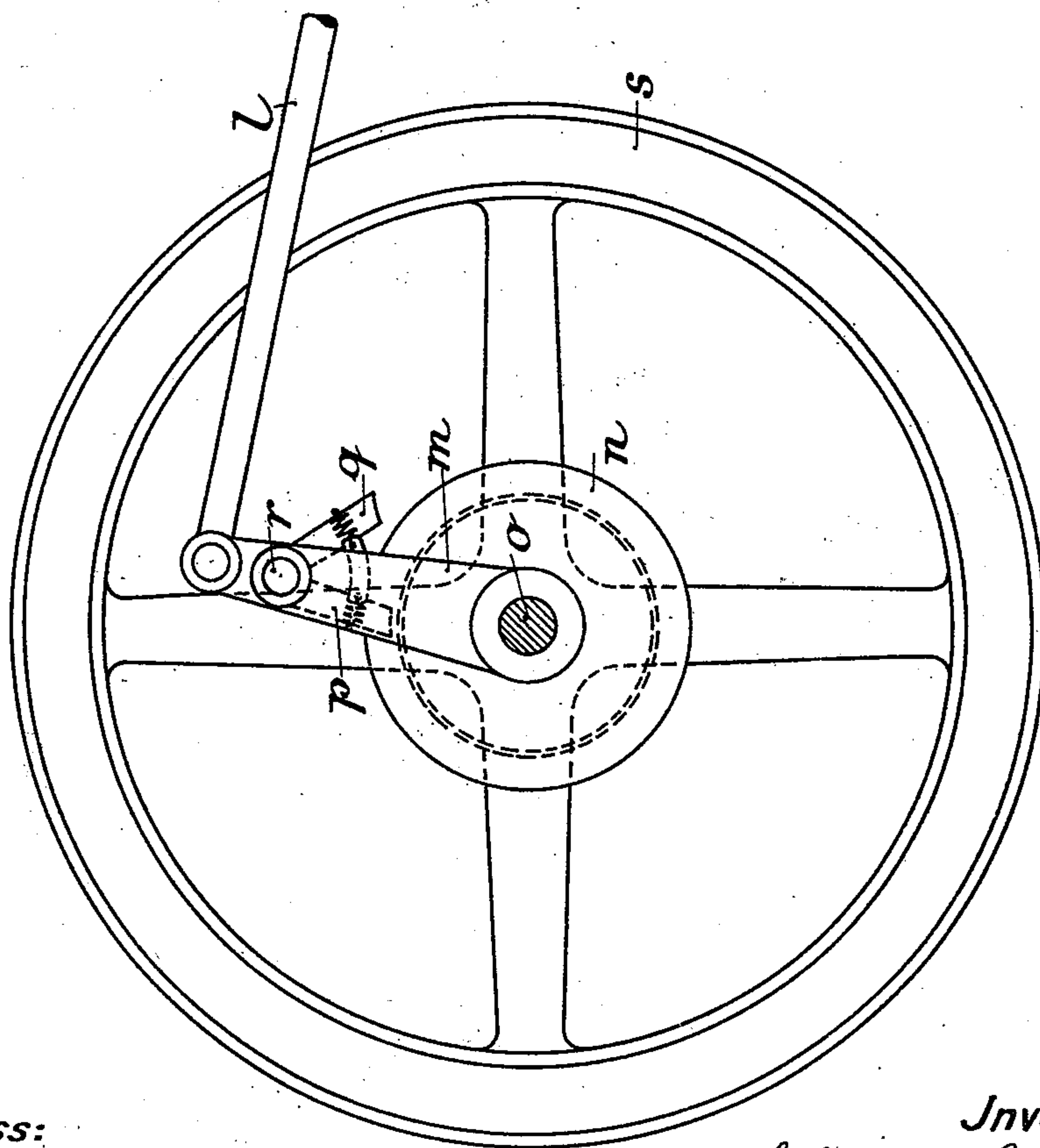


Fig. 1.



Witnesses:

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George H. Bliss, Jr.

Inventor:

Johannes Grimme.
By Attorney: *Herbert W. Jenner*

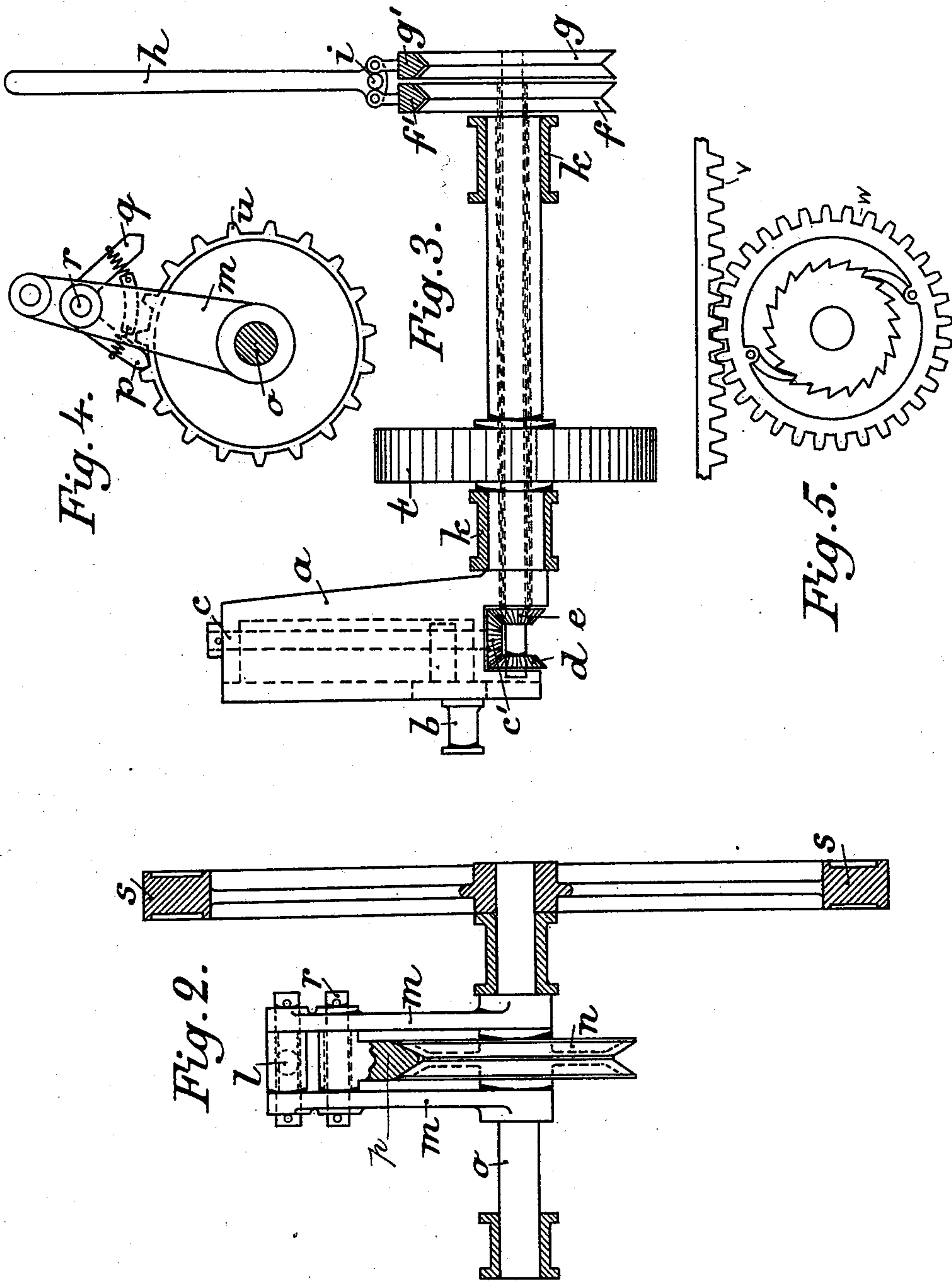
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Witnesses:

Frank A. Gregory
George H. Bliss, Jr.

Inventor:

By Attorney Johannes Grimme.
Herbert W. Jenner.

UNITED STATES PATENT OFFICE.

JOHANNES GRIMME, OF BOCHUM, GERMANY.

DRIVING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 561,260, dated June 2, 1896.

Application filed February 10, 1896. Serial No. 578,738. (No model.)

To all whom it may concern:

Be it known that I, JOHANNES GRIMME, a subject of the German Emperor, residing at Bochum, Westphalia, in the Kingdom of Prussia, and German Empire, have invented certain new and useful Improvements in Driving Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a mechanism, actuated by the machinery with which it is connected, which enables the speed of moving parts actuated from a crank-shaft to be varied at will, or to enable them to be stopped altogether, without in any way interfering with the motion of the crank-shaft itself.

Figure 1 of the accompanying drawings shows the mechanism in combination with one of the well-known reciprocating driving-gears, of which Fig. 2 shows a vertical section. Fig. 3 shows a front view of the mechanism for varying the speed. Figs. 4 and 5 show side views of modifications of the construction shown at Fig. 2.

The crank a of the shaft revolving in the bearings k carries a guide in which a slide carrying the crank-pin b can be shifted by means of a screw-spindle c . This screw-spindle c carries at the end next the shaft a bevel-pinion c' , gearing with two other bevel-pinions d and e , Fig. 3. The latter two are fixed on shafts situated concentrically within the crank-shaft, with their other ends projecting from the latter, and on these ends are fixed the friction-disks f and g . Over these disks is situated a T-headed lever h , pivoted to a fixed support at i , the longer arm of which lever serves as a hand-lever while the two short arms carry brake-blocks f' g' , pivoted thereto in such manner that on moving over the lever h to the one side or the other either the friction-disk f is held stationary by the block f' or the friction-disk g is held stationary by the block g' . From this arrangement it will be seen that by the rotation of the crank-shaft driven by a bell-pulley t or otherwise the two pinions d e , and consequently the disks f g , will also be carried round thereby. If, however, by moving over the lever h one of the two disks f and g , and con-

sequently the pinion fixed to its shaft, be held stationary, the pinion c' , fixed on the screw-spindle c , will be caused to roll round upon the stationary pinion, and consequently the crank-pin b will be shifted toward or from the crank-shaft.

According as the stroke of the crank is lengthened or shortened by such shifting of the crank-pin, the peripheral speed of the latter will be increased or decreased, and in consequence thereof the mechanisms which are actuated by the crank-pin will be made to move with a corresponding increased or decreased speed. The adjustment of the crank-pin b is so arranged that the speed can be reduced to zero by bringing the center of the crank-pin in the axial line of the shaft. In this position all movement of the driving-gear connected to the crank will cease although the crank-shaft continues to rotate at its original speed.

In the drawings the above-described mechanism is combined with an arrangement which admits of a reversal of the motion independently of the change of speed. This arrangement consists, as shown at Figs. 1 and 2, of a lever m , mounted loose on the shaft o , the free end of which lever is connected by a connecting-rod l with the crank-pin b .

By the rotation of the crank-shaft a the lever m will receive a reciprocating motion, the extent of such motion depending upon the stroke, for the time being, of the crank a .

On the lever m are mounted two opposite pawls p and q , pivoted to lever m at r , one of which pawls—for example, p —is shown in the drawings gearing with the V-shaped groove of a friction-disk n , fixed on the shaft o , so that at each stroke of lever m to the left hand the friction-disk n and shaft o will be rotated through a corresponding angle, while on the movement of lever m to the right the pawl p will slide over the disk n .

By making the pawl q gear with the friction-disk n in place of pawl p the direction of rotation of the shaft will be reversed.

For producing a uniform rotary motion of shaft o this is provided with a fly-wheel s . When greater power has to be transmitted, the friction ratchet device can be replaced by a toothed ratchet mechanism u , as shown at Fig. 4, and in place of transmitting the mo-

tion by a connecting-rod and lever it may be effected by a toothed rack *v* and spur-wheel *w*, as shown at Fig. 5.

As by the alteration of the stroke of the crank *a* the stroke of the lever *m* is also altered, while the speed of the crank-shaft remains the same, there will of course result a change of speed of the shaft *o*, as the lever *m* must perform its larger strokes in the same time as its smaller strokes.

It will be evident that in place of the friction-disks *f* and *g* and their brake-blocks *f'* *g'* any equivalent known mechanism, such as ratchet-wheels and pawls, may be employed.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination, with a hollow crank-shaft, of a sleeve journaled therein, a shaft journaled in the said sleeve, a crank secured on the end of the crank-shaft, beveled toothed wheels secured respectively on the said shaft and sleeve at the hub of the crank, a screw-threaded spindle journaled in the crank and provided with a beveled toothed wheel gearing into both the aforesaid wheels, a crank-pin slidable radially in the said crank and engaging with the said spindle, brake-wheels secured respectively on the said sleeve and shaft, a pivoted hand-lever, and brake-blocks pivoted to the said hand-lever and operating to bear alternately on the said brake-wheels, whereby the throw of the said crank-pin may be varied or reduced to zero, substantially as set forth.

2. The combination, with a shaft, a fly-

wheel secured thereon an oscillatory lever *m*, and ratchet mechanism operatively connecting the said lever with the shaft; of a hollow crank-shaft provided with a crank at one end, a screw-threaded spindle journaled in the said crank, a slidable crank-pin engaging with the said spindle, a sleeve and an internal shaft journaled in the hollow crank-shaft, beveled toothed wheels connecting the said sleeve, spindle, and internal shaft; brake-wheels secured respectively on the said sleeve and internal shaft, and means for arresting the motion of the said brake-wheels alternately and thereby varying the speed of the first said shaft by changing the throw of the crank-pin, substantially as set forth.

3. The combination, with a hollow crank-shaft provided with a crank at one end, of a crank-pin slidable radially in the said crank, a screw-threaded spindle journaled in the said crank and engaging with the said crank-pin, a sleeve and an internal shaft journaled in the hollow crank-shaft, beveled toothed wheels connecting the said sleeve, spindle, and internal shaft, brake-wheels secured respectively on the said sleeve and internal shaft, and a pivoted hand-lever provided with brake-blocks adapted to bear alternately on the said brake-wheels, and operating to vary the throw of the crank-pin, substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHANNES GRIMME.

Witnesses:

H. F. HESS,
L. RORIG.