No. 644,290. Patented Feb. 27, 1900.

J. E. GOODHUE.

POWER TRANSFORMING MACHINE.

(Application filed Nov. 6, 1899.)

(No Model.) 2 Sheets—Sheet 1.

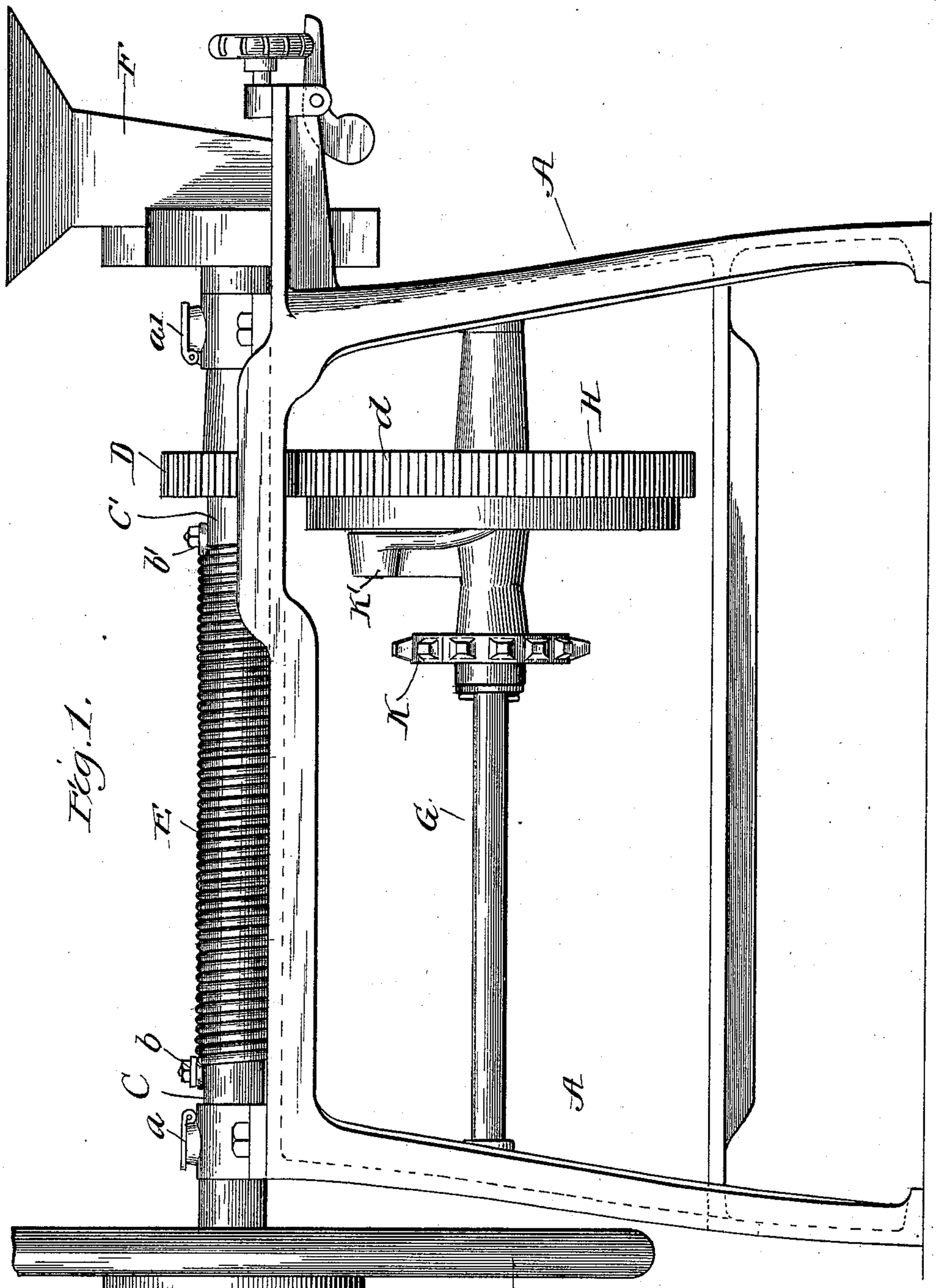


Fig. 1.

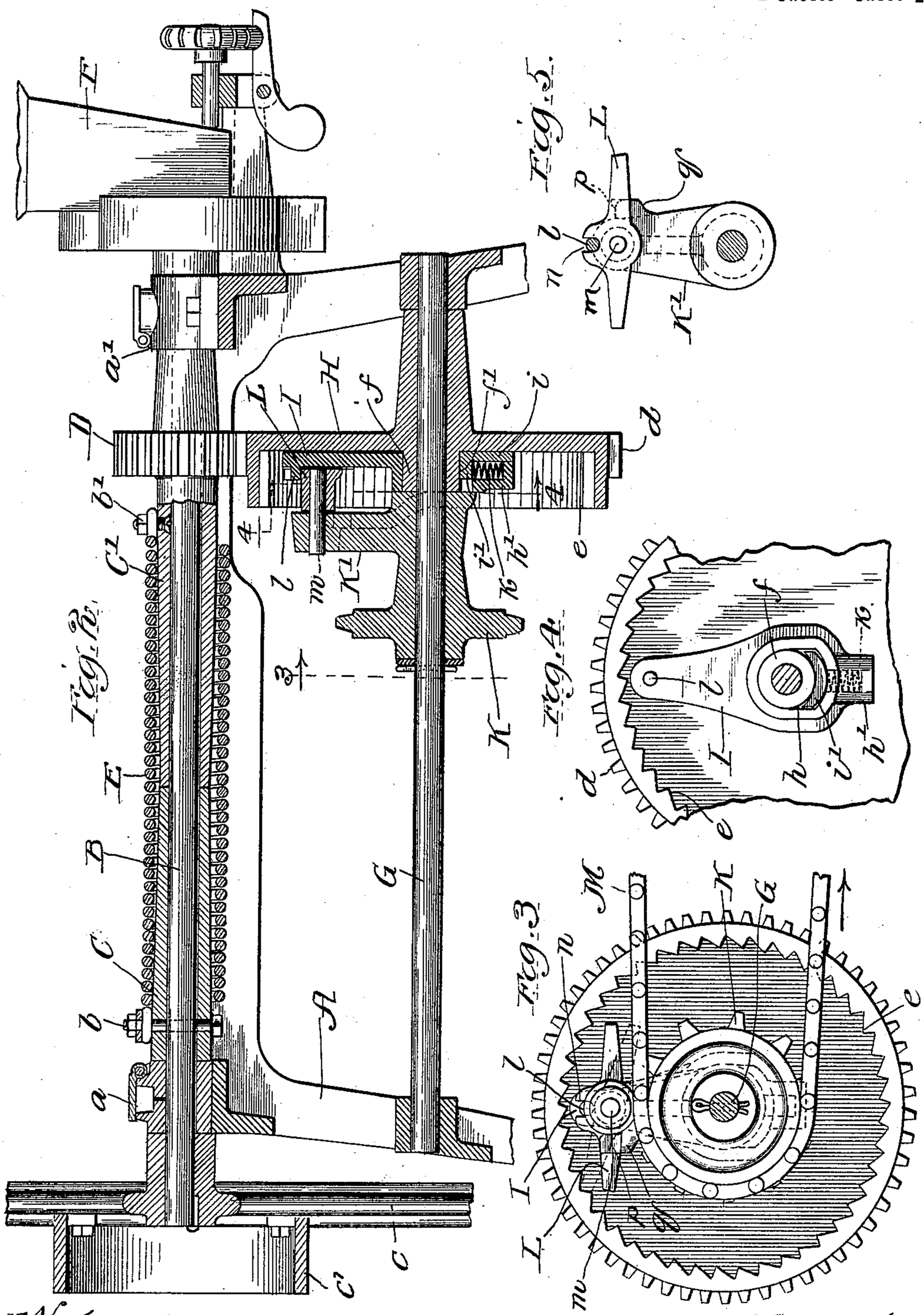
No. 644,290. Patented Feb. 27, 1900.

J. E. GOODHUE.

POWER TRANSFORMING MACHINE.

(Application filed Nov. 6, 1899.)

(No Model.) 2 Sheets—Sheet 2.



Witnesses:
H. G. Barnett.
D. H. Lee.

Inventor:
James E. Goodhue,
By Dyrenforth & Dyrenforth, Attys.

UNITED STATES PATENT OFFICE.

JAMES E. GOODHUE, OF ST. CHARLES, ILLINOIS.

POWER-TRANSFORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 644,290, dated February 27, 1900.

Application filed November 6, 1899. Serial No. 736,006. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. GOODHUE, a citizen of the United States, residing at St. Charles, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Power-Transforming Machines, of which the following is a specification.

My present invention is in the nature of an improvement upon the power-transforming machine shown and described in Letters Patent No. 563,955, granted to me July 14, 1896.

The function of the machine is to convert a more or less unsteady reciprocating motion, such as that of a windmill plunger-rod, into a comparatively-uniform rotary motion.

My object is to provide certain advantageous changes over the construction shown in my aforesaid Letters Patent and more especially to improve, strengthen, and simplify the intermittent grip mechanism.

Referring to the drawings, Figure 1 is a broken side elevation of my improved machine; Fig. 2, a broken longitudinal section thereof; Fig. 3, a section taken on line 3 of Fig. 2 and viewed in the direction of the arrow; Fig. 4, a broken sectional view taken on the irregular line 4 4 in Fig. 2 viewed in the direction of the arrow; and Fig. 5, a section on the same line as Fig. 4, but viewed in the opposite direction.

A is the main frame of the machine, provided with bearings *a a'* for a rotary shaft B. Surrounding the shaft B between the bearings *a a'* are two separate abutting sleeves C C'. The sleeve C is fastened to the shaft by a bolt *b*, while the sleeve C' is loose upon the shaft and carries a pinion D. The sleeves taper slightly to their abutting ends, as shown, and are surrounded by a helical spring E, fastened at one end to the bolt *b* and fastened at its opposite end to the sleeve C' by means of a bolt *b'*. On one end of the shaft B are a fly-wheel *c* and pulley *c'*, and the opposite end of the shaft may carry one of the grinding members of a grinding-mill F, like that shown in my aforesaid Letters Patent, and therefore not necessary to illustrate in the present case.

Mounted in the frame A in a plane below the shaft B is a stationary shaft G. Rotating upon the shaft G is a wheel H, having outer circumferential gear-teeth *d*, meshing with the pinion D, and inner circumferential ratchet-teeth *e*. The wheel H is formed with an inwardly-projecting hub portion *f*, having an outer circumferential friction-surface *f'*.

I is an arm provided with an opening *h*, at which it loosely surrounds the hub *f*. In the base portion of the arm is a cup or socket portion *h'*. Fitting between the cup portion *h'* and the adjacent surface of the wheel H is a sliding shoe *i*, formed with a flange *i'*, which projects over the top of the socket *h'* and is concave at its upper end to engage the friction-surface *f'* of the hub. In the socket *h'* is a confined spring *k*, which operates normally to press the shoe against the friction-surface *f'*. The shoe *i* is held against lateral play at the socket-piece and moves with the arm I upon the hub. Toward the free end of the arm I is a short pin or stud *l*. Mounted to rotate upon the shaft G is a sprocket-wheel K, formed integral with a radially-extending arm K'. The arm K' carries a pin *m*, upon which is pivotally mounted a pawl L, formed on its upper side with a socket *n*, which receives the stud *l*. On the pawl L is a projecting shoulder *p*, which rests normally against a shoulder *q* on the arm K'.

M is a drive-chain which extends over the sprocket-wheel K and is caused by the reciprocating prime mover, (not shown,) which may be an oscillating lever actuated from the plunger-rod of a windmill, as shown in my aforesaid Letters Patent, to move back and forth.

In the movement of the chain M in the positive direction (indicated by the arrow in Fig. 3) the sprocket-wheel K and arm K' are turned to the left in Fig. 3, causing the pawl L to be turned by the pin *m* on the fulcrum afforded by the stud *l* to the position indicated by dotted lines in Fig. 3, wherein it engages a tooth of the ratchet *e*. The frictional engagement of the shoe *i* with the hub *f* tends slightly to retard movement of the arm I on the hub *f*, so that in the initial movement of the arm K' the pawl is turned into engagement with the ratchet, owing to the slight resistance to movement of the arm I. In the further movement of the chain M in the positive direction the wheel H is rotated by the pawl L and rotates the pinion D and sleeve C'. As the sleeve C' rotates it draws upon the spring E,

tending to set or wind the same upon the sleeves and causing it at its opposite end to draw upon the sleeve C to rotate the same and the shaft B. When the chain M commences to move in the opposite direction from that described, the turning of the sprocket-wheel K and arm K′ in the direction to the right in Fig. 3 causes the pawl, owing to the slight resistance to movement of the arm I, to be swung out of engagement with the ratchet-teeth and to bear against the shoulder *q*, after which the arms K I will move together, the wheel H being released. The fly-wheel *c* tends to continue the rotation of the shaft B after its release by the intermittent grip mechanism described, and the recoil of the spring E also exerts itself against the sleeve C to continue the rotation of the shaft.

The construction of the intermittent grip mechanism, involving the friction-retarded arm I, pawl, and arm K, causes the pawl to engage and release the ratchet very quickly on change of motion of the chain M.

By mounting the sprocket-wheel and intermittent grip mechanism upon a shaft G, instead of, as formerly, upon the shaft B, and providing the gear and pinion H D, I am enabled to speed up the shaft B, which is an advantage.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a power-transforming device, the combination of a rotary shaft, a pinion loose upon the shaft, a spring surrounding the shaft and connected at one end with the shaft and at its opposite end with the pinion, a reciprocal driving sprocket-wheel, a gear-wheel meshing with said pinion, and intermittent grip mechanism between said sprocket and gear wheels, substantially as and for the purpose set forth.

2. In a power-transforming device the combination with the reciprocal drive-wheel and the internally-toothed ratchet-wheel H having the friction-hub *f*, of an arm upon the drive-wheel, a pawl pivotally mounted upon said arm, an arm I loose upon the said hub within the ratchet-wheel and loosely engaging the pawl eccentrically of its pivot, and friction retarding means between said hub and arm I, substantially as and for the purpose set forth.

3. In a power-transforming device the combination with the reciprocal drive-wheel and the internally-toothed ratchet-wheel H having the friction-hub *f*, of an arm upon the drive-wheel, a pawl pivotally mounted upon said arm, an arm I loose upon the said hub within the ratchet-wheel and loosely engaging the pawl eccentrically of its pivot, a shoe upon the arm I and a spring upon the arm I operating to press the shoe against the said hub, all constructed and arranged to operate substantially as set forth.

JAMES E. GOODHUE.

In presence of—
E. H. LYMAN,
F. M. GOODHUE.