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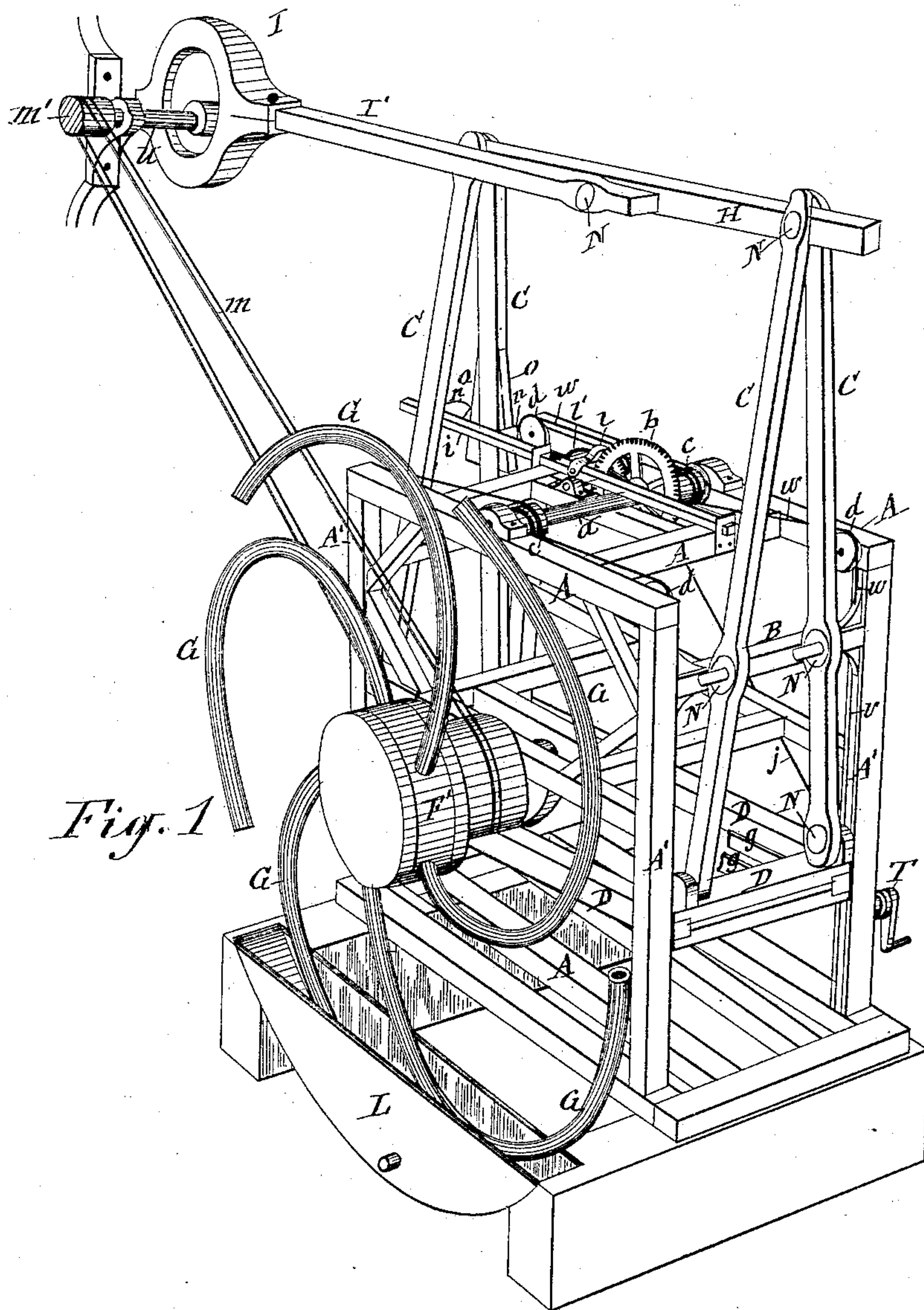
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C. W. GREEN.

STONE SAW GANG AND SAND FEED COMBINED.

No. 371,313.

Patented Oct. 11, 1887.



WITNESSES:

C. E. Tomlinson  
C. Burdison

INVENTOR

Cyril W. Green

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Smith, Laess & Smith

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(No Model.)

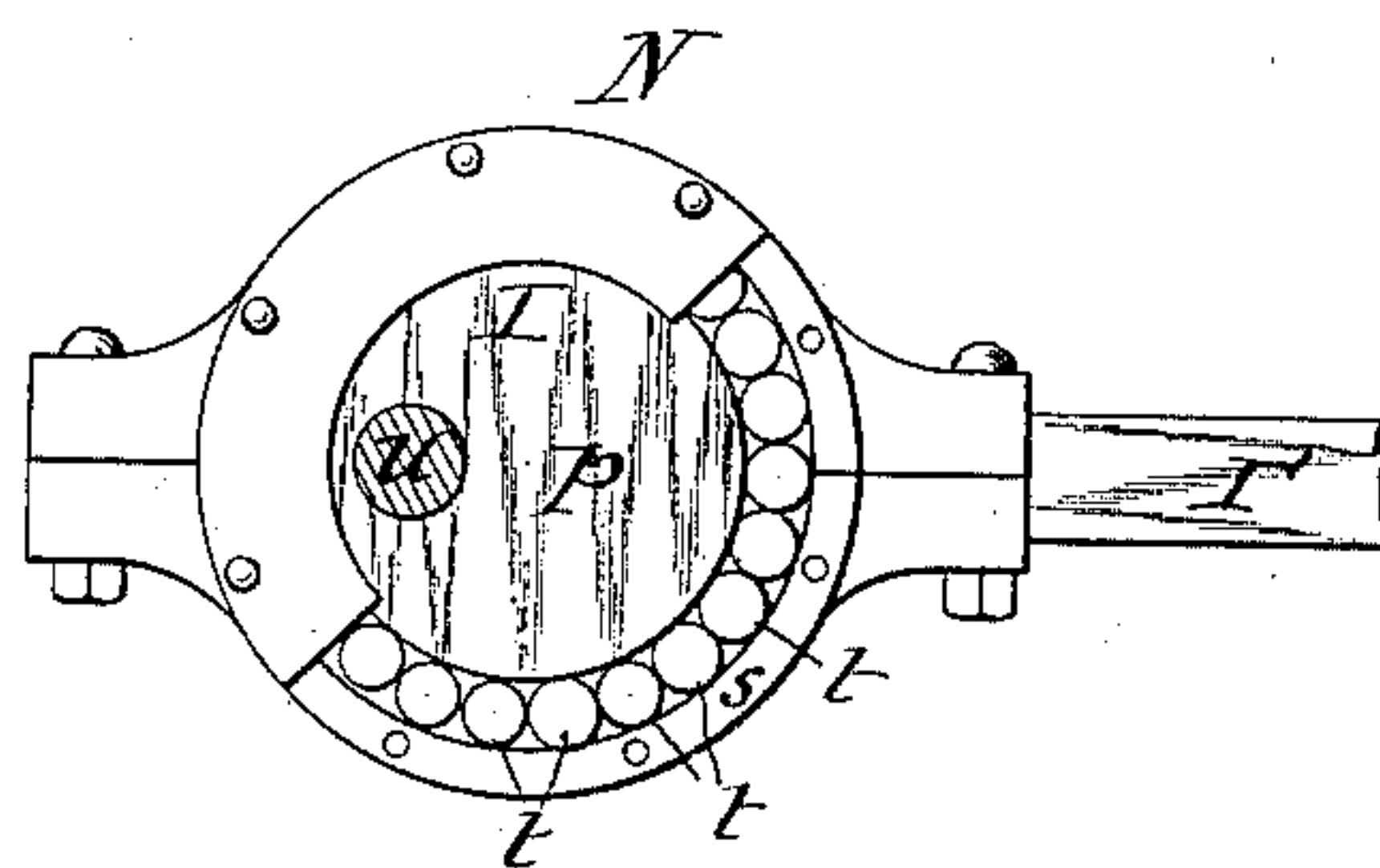
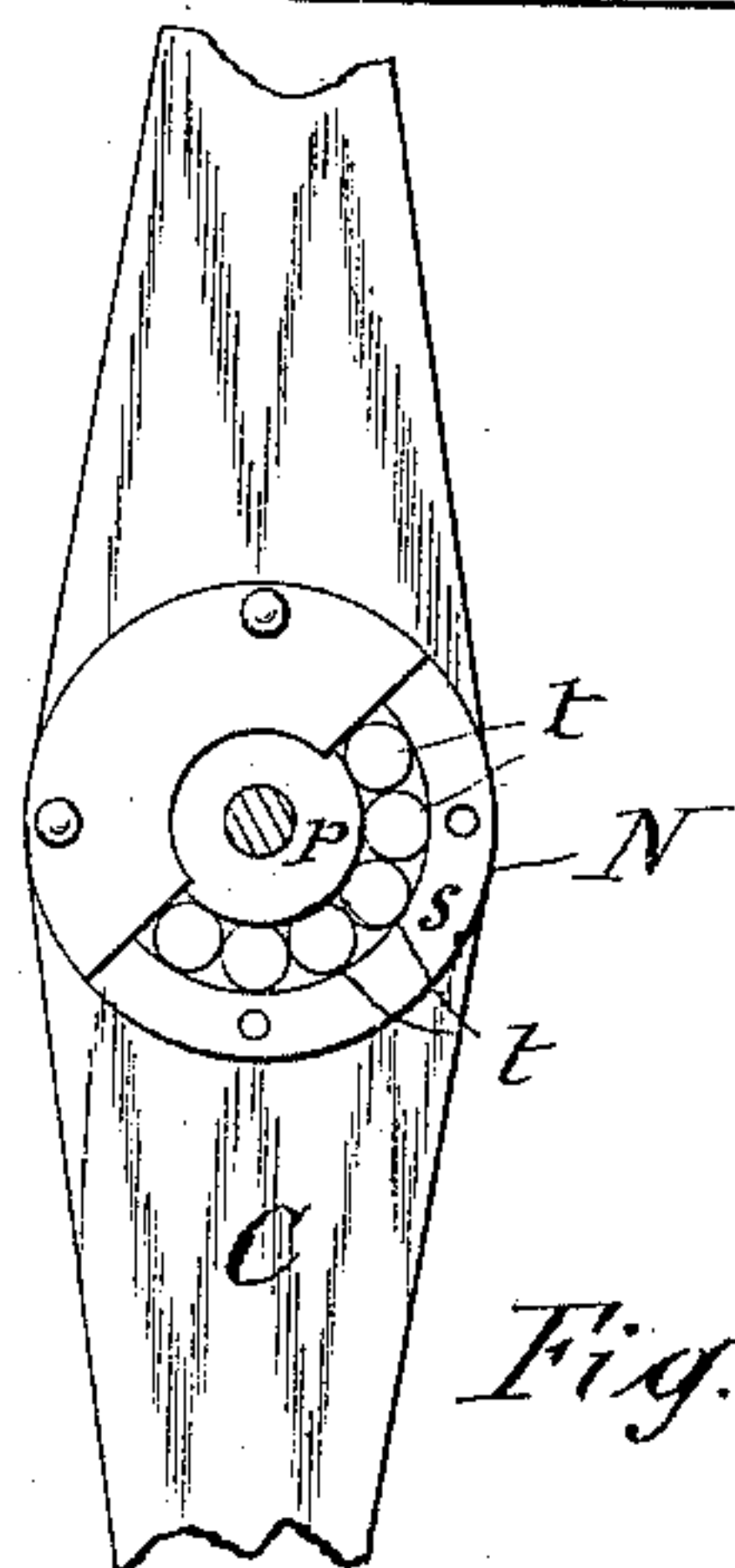
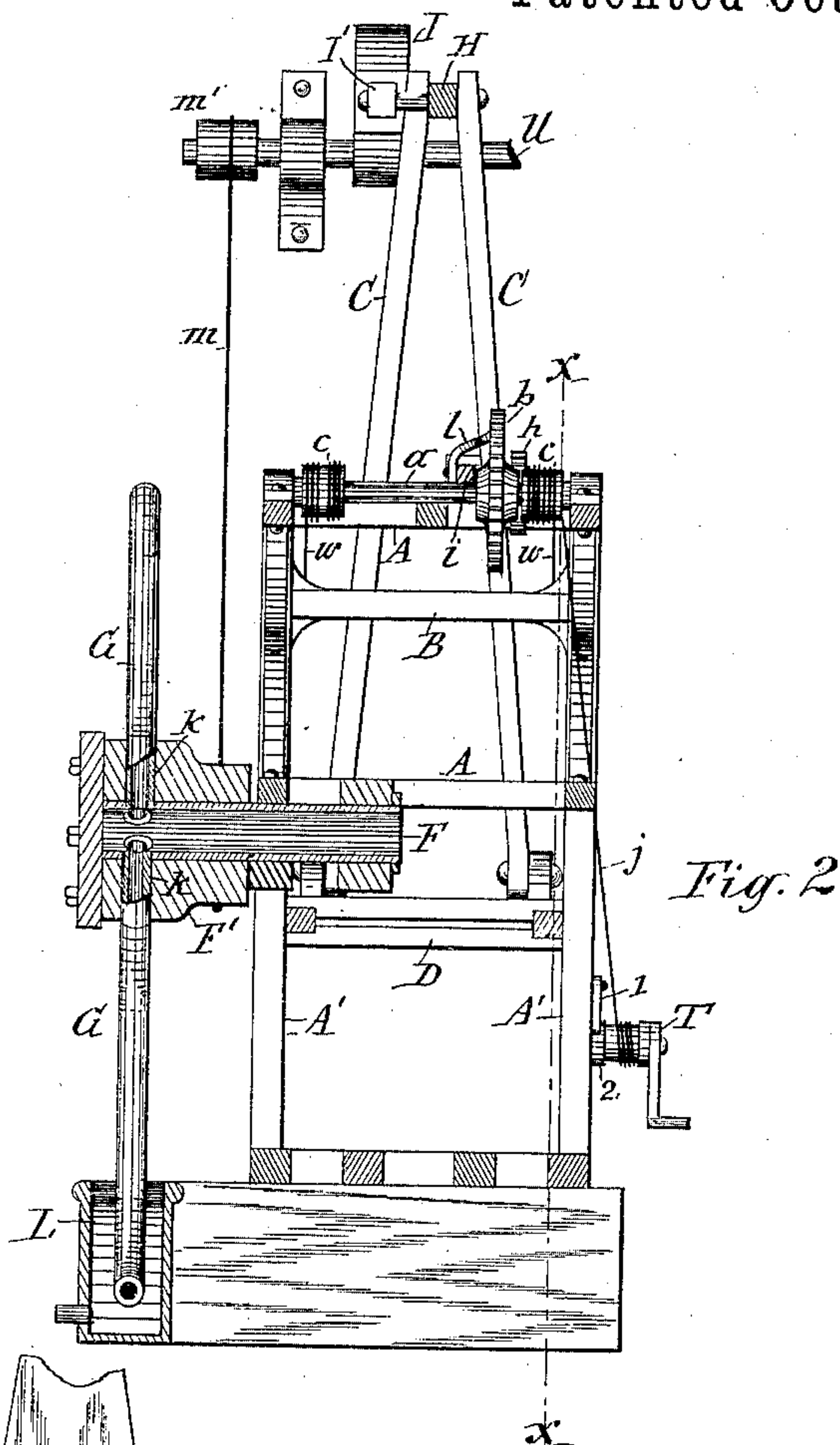
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WITNESSES:

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(No Model.)

3 Sheets—Sheet 3.

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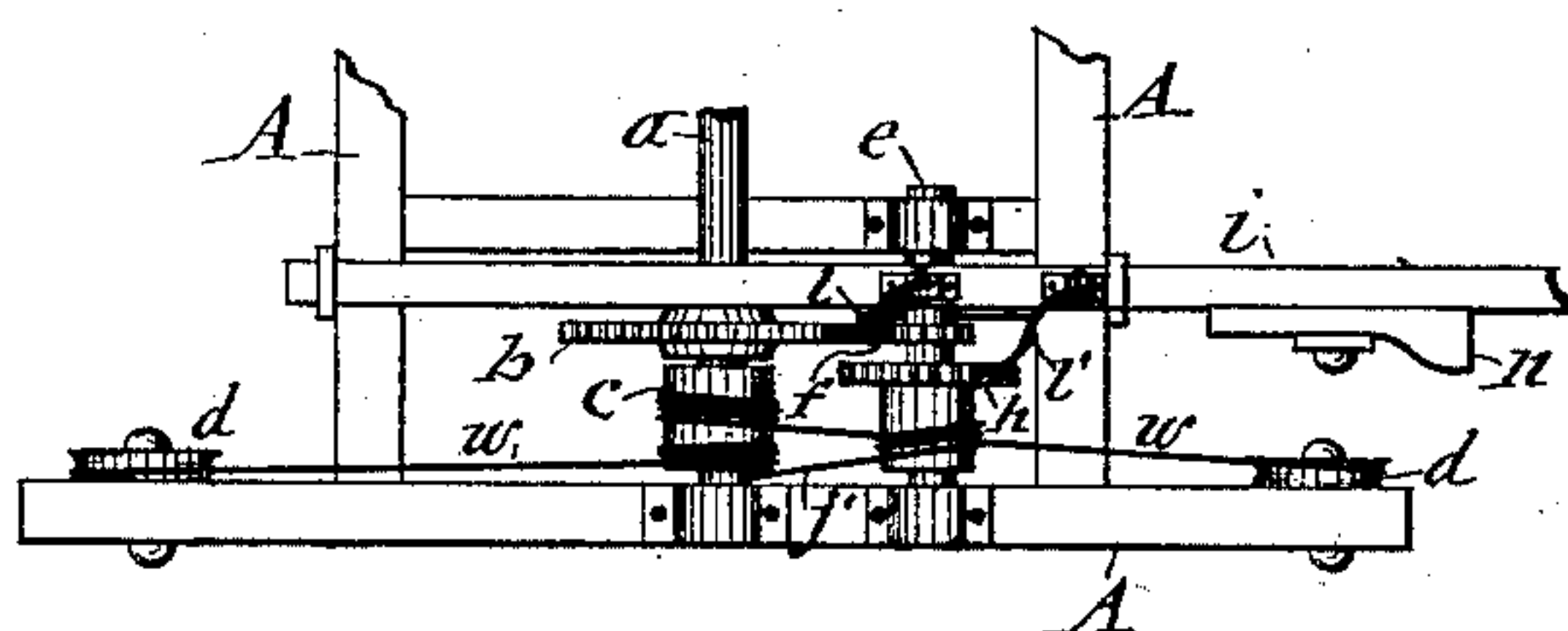
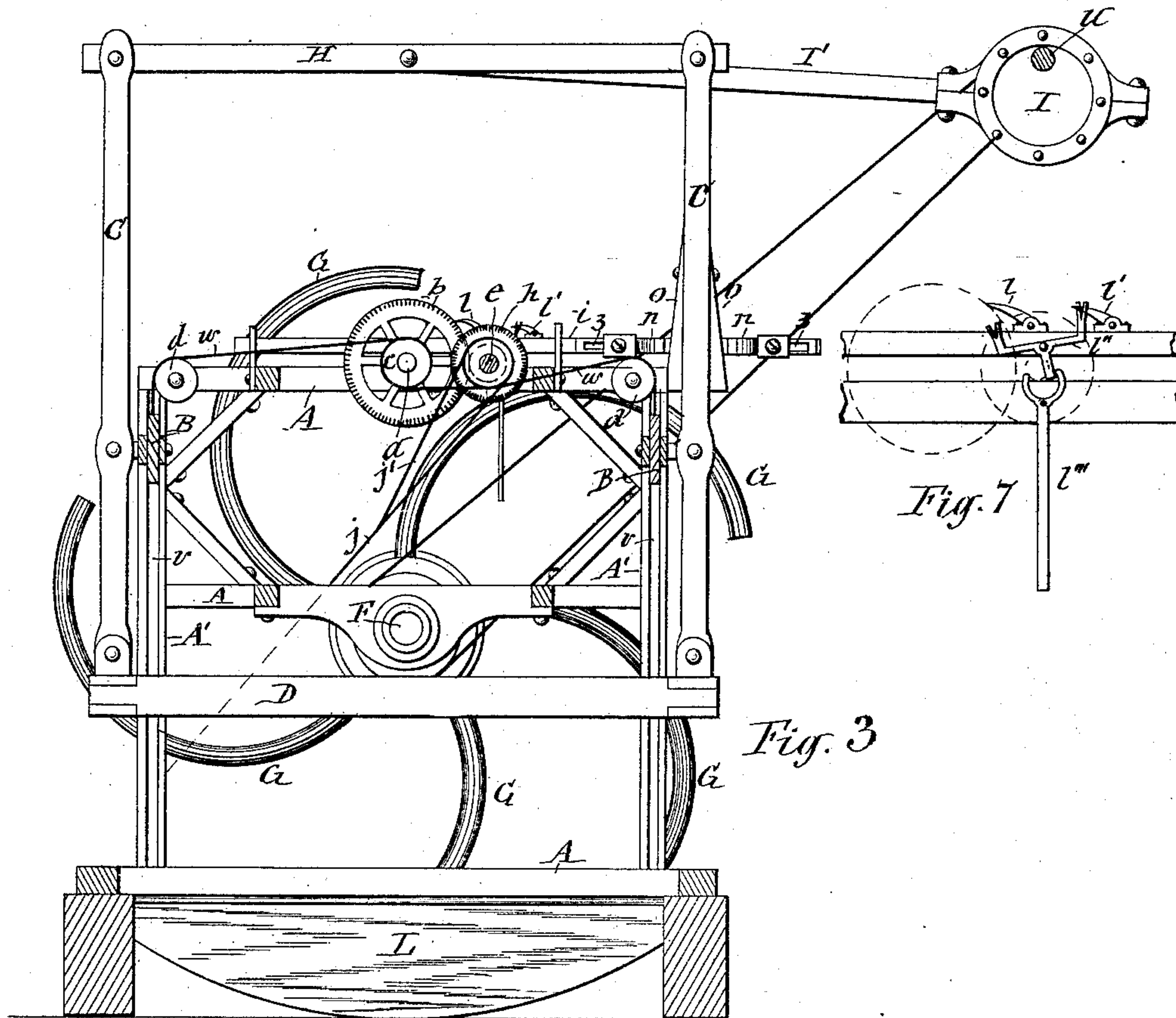


Fig. 4

WITNESSES:

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# UNITED STATES PATENT OFFICE.

CYREL WORINGTON GREEN, OF WEST RUTLAND, VERMONT.

## STONE-SAW GANG AND SAND-FEED COMBINED.

SPECIFICATION forming part of Letters Patent No. 371,313, dated October 11, 1887.

Application filed April 11, 1887. Serial No. 234,348. (No model.)

*To all whom it may concern:*

Be it known that I, CYREL WORINGTON GREEN, of West Rutland, in the county of Rutland, in the State of Vermont, have invented  
5 new and useful Improvements in Stone-Saw Gang and Sand-Feed Combined, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention consists in a novel organization of a machine designed for sawing stone and to automatically feed the saws with water and sand during the operation of said saws, and which machine is simple and compact in  
15 construction, requiring less space than other machines of this class, and receives motion through the medium of a system of levers which materially facilitates the operation of the machine, all as hereinafter fully described,  
20 and specifically set forth in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a stone-saw gang and sand-feed combined embodying my invention. Fig. 2 is a vertical transverse section of the  
25 same, taken through the center of the automatic sand-feed. Fig. 3 is a vertical longitudinal section taken on lines *x x*, Fig. 2. Fig. 4 is a top plan view of the mechanism which regulates the feed of the saws in their  
30 operation. Figs. 5 and 6 are detail views of the anti-friction bearings of the levers and eccentric, respectively; and Fig. 7 is a detached side view of the devices by which the pawls of the saw-gang feed are thrown in and out  
35 of gear.

Similar letters of reference indicate corresponding parts.

A represents the main supporting-frame of the machine, the corner-posts *A' A'* of which  
40 frame I provide with vertical guide-grooves *v v*, in which are fitted to slide vertically the fulcrum-bars *B B*, and to these fulcrum bars are pivotally connected levers *C C C C*, to the lower ends of which is connected the saw-  
45 frame *D*, to which latter the saws *g g* are secured in any suitable and well-known manner. The two levers at each end of the machine are inclined with their upper ends toward each other, and a single bar, *H*, is con-  
50 nected at opposite ends between the upper ends of the respective sets of levers.

I represents the eccentric, mounted on a

driving-shaft, *U*, and from said eccentric is extended a rod, *I'*, the extremity of which is pivotally connected to the connecting-bar *H*,  
55 hereinbefore referred to. Said eccentric, when in motion, imparts reciprocating motion to the bar *H*, and by that means oscillatory motion is transmitted to the levers *C C C C*, and the motion of the latter imparts the requisite  
60 motion to the saw-frame *D*.

The lowering and raising of the saw-frame I accomplish by the following feed mechanism: Across the top of the frame *A*, I place a  
65 shaft, *a*, journaled in suitable boxes on said frame, and to the said shaft I rigidly secure a gear-wheel, *b*, and drums *c c*, and to the upper part of opposite ends of the frame *A*, I pivot sheaves *d d*. Over these sheaves run  
70 wire ropes *w w*, which are connected at one end to the aforesaid drums and at the opposite end to the fulcrum-bars *B B*, the ropes at each side of the frame being wound on the drum in  
75 opposite directions, so that by rotating said drums the two ropes running therefrom are either paid out or wound up in unison, according to the direction in which the drum is  
80 turned. The fulcrum-bars, being suspended by said ropes, are thus lowered and raised by the aforesaid movement of the ropes. On the  
85 top of the frame *A* is mounted a sliding bar, *i*, to which are connected two jaws, *n n*, which project laterally therefrom, so as to be encountered by one of the levers *C* during the  
90 oscillation thereof, and thus the aforesaid sliding bar receives reciprocating motion during the oscillation of the aforesaid lever. To the sliding bar is pivotally connected a pawl, *l*, which is adapted to engage the gear *b*, and  
95 thus rotates said wheel in a direction which causes the ropes *w w* to be wound up on the drums, and consequently raises the saw-frame *D*. Parallel with the shaft *a* is a counter-shaft,  
100 *e*, journaled in suitable bearings secured to the frame *A*. To this counter-shaft is secured a pinion, *f*, which meshes in the gear-wheel *b*, as shown in Fig. 4 of the drawings. To the counter-shaft is also rigidly secured a ratchet-wheel, *h*, with which is adapted to engage a  
pawl, *l'*, connected to the sliding bar *I*, here-  
inbefore referred to. By throwing the pawl *l'* out of engagement with the gear *b* and the  
pawl *l'* into engagement with the ratchet-wheel *h* when the machine is in operation the shaft



*a* is rotated in a direction which causes the ropes *w w* to be unwound from the drums *c c*, and thus the fulcrum-bars *B B* are allowed to descend, together with the levers *C C C C*, connected thereto, and saw-frame hung on said levers. The pawls *l l'* may be shifted by means of suitable levers, *l''* and *l'''*, as shown in Fig. 7 of the drawings.

In order to maintain the aforesaid shafts dormant in their positions while the pawls are out of engagement, I employ a suitable brake, which I have represented in the annexed drawings in the form of a wire rope, *j*, attached at one end to a friction-band, *j'*, surrounding the drum *j''* on the counter-shaft *e*, and connected at the opposite end to a winch, *T*, by means of which the said wire rope can be wound up, so as to exert sufficient friction on the drum of the counter-shaft to restrain the rotation thereof, as aforesaid. A dog, *1*, pivoted on the frame *A* and engaging a ratchet, *2*, on the winch, serves to maintain the wire rope *j* at the requisite tension.

Inasmuch as it is preferred to arrange the main driving-shaft *U* at an elevation above the connecting-bar *H* and at the proper distance from the end thereof, it is obvious that during the descent of the saw-frame with its levers *C C C C* and connecting-bar *H* the angle between the eccentric-rod *I'* and connecting-bar *H* is constantly changed, and said latter bar is gradually drawn toward the side at which the main driving-shaft is located, and consequently the motion of the connecting-bar with the levers *C C C C* connected thereto is gradually reduced.

In order to reduce the motion of the feed-wheels *b* and *h* correspondingly, I attach to the lever *C* with which the jaws of the sliding bar *I* engage cheek-pieces *n n*, which are tapered from their lower ends upward.

The aforesaid feed I render adjustable by connecting the jaws *n n* adjustably in their positions on the bar *i*, which may be effected by providing said bar with longitudinal slots *3* for the reception of the bolts by which the jaws are clamped on the bar, as best seen in Fig. 3 of the drawings.

Inasmuch as machines of this class are exposed to more or less grit, it is necessary to guard against friction in the bearings of the machine as much as possible, and in order to meet this requirement I employ anti-friction bearings *N N* around the eccentric *I* and at all of the pivotal connections of the levers *C C C C* with the bar *H*, fulcrum-bars *B B*, and saw-frame *D*, and also in the connection of the pitmen *I'* with the bar *H*. These anti-friction bearings consist each of a hub, *p*, secured to one of the aforesaid parts, and an annular plate, *s*, secured to the adjacent part, and balls or rollers *t t*, interposed between said hub and plate, as illustrated in Figs. 5 and 6 of the drawings.

In connection with the described machine I employ an automatic sand-feed, consisting of a hollow rotary shaft, *F*, mounted horizontally

in suitable bearings secured to the frame *A*, and having one end open and over the central portion of the saw-frame *D*. The opposite end of said shaft is closed and has secured to it a hub, *F'*, and this hub is provided with radial channels *k k*, communicating with the interior of the shaft *F*. In the said channels are firmly secured suitable dippers, *G G*, preferably of the form of pipes curved similar to the arms of the so-called "Persian wheel." The free ends of said pipes terminate nearly concentric with the axis of the shaft *F* and pass through a trough or reservoir, *L*, in which are deposited sand and water. During the rotation of the shaft *F* the dippers or pipes *G G* collect sand and water from the reservoir *L* and conduct said sand and water into the pipe *F*, which deposits the same on the top of the stone operated on by the saws.

The described sand-feed is operated synchronously with the operation of the saws by means of a driving-belt, *m*, running on the hub of the shaft *F* and on a pulley, *m'*, secured to the driving-shaft *U*.

I do not limit myself specifically to the employment of the curved pipes *G G*, as it is obvious that dippers of various forms can be made to move with the shaft and conduct sand and water to the same; neither do I limit myself to the use of the eccentric *I*, inasmuch as a crank will answer the same purpose.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the main frame and the reciprocating saw-frame and water and sand reservoir, a hollow rotary shaft arranged horizontally and having one end open and over the saws, a hollow hub secured to the opposite end of said shaft, and hollow curved arms projecting from the hub and communicating with the interior of the hollow shaft, and having their free ends open and arranged to pass through the aforesaid reservoir, substantially as described and shown.

2. In combination with the main frame *A*, provided with vertical guides, and the fulcrums *B B*, sliding on said guides, the levers *C C*, inclined with their upper ends toward each other, the single bar *H*, connected at opposite ends to the upper ends of the two sets of levers, the pitman *I'*, connected to the bar *H*, and the saw-frame *D*, hung on the lower ends of said levers, substantially as described and shown.

3. The combination of the main frame *A*, provided with vertical guides *A' A'*, the fulcrums *B B*, sliding on said guides, the levers *C C*, connected to said fulcrums, the saw-frame *D*, hung on said levers, the shaft *a*, pivoted on the main frame, the gear-wheel *b* and drums *c c*, secured to said shaft, sheaves *d d d d*, pivoted to the main frame, ropes passing over the sheaves and connected at opposite ends to the drums and fulcrums, the counter-shaft *e*, the pinion *f* and ratchet-wheel *h*, both attached to said counter-shaft, the sliding bar *i*, actu-



ated by the aforesaid levers, and the pawls *l l'*, connected to said sliding bar and adapted to be thrown in and out of engagement, respectively, with the gear-wheel *b* and ratchet-wheel *h*, substantially as described and shown.

4. In combination, main frame, vertically-movable fulcrums, oscillatory levers connected to said fulcrums, and saw-frame hung on said levers, the shaft *a*, gear-wheel *b* and drums *c c*, secured to said shaft, the sheaves *d d d d*, ropes running from the drums over the sheaves and connected to the fulcrums, the counter-shaft *e*, pinion *f* and ratchet-wheel *h*, both attached to said counter-shaft, the sliding bar *i*, jaws *n n*, adjustably connected to the said bar, and pawls *l l'*, connected to the sliding bar, substantially as described and shown.

5. In combination with the feed-gears *b* and *h*, sliding bar *i*, provided with jaws *n n* and pawls *l l'*, vertically-movable fulcrums *B B*, and the levers *C C C C*, connected to said fulcrums, the cheek-pieces *o o*, secured to one of the levers between the jaws *n n* and tapered from their lower to the upper ends, substantially as described and shown, for the purpose set forth.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at West Rutland, in the county of Rutland, in the State of Vermont, this 5th day of April, 1887.

CYREL WORINGTON GREEN. [L. s.]

Witnesses:

A. A. KIDDES,  
D. M. SCHELL.