

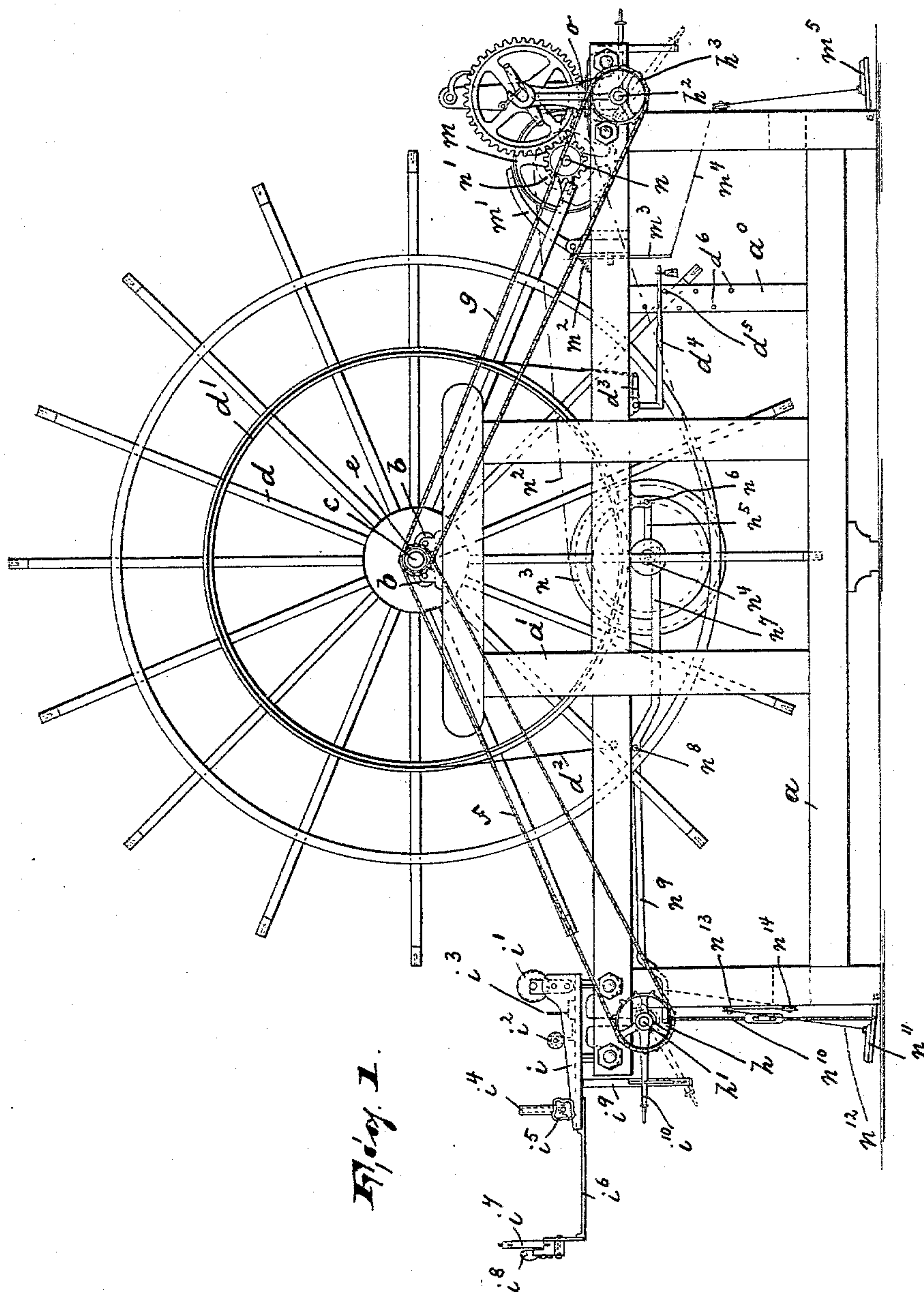
(No Model.)

3 Sheets—Sheet 1.

R. ATHERTON.  
WARPING MACHINE.

No. 597,871.

Patented Jan. 25, 1898.



WITNESSES:

INVENTOR:

*Wm. Drell.*  
*Jackson L. Males*

*Robert Atherton*

BY  
*Partner & Co*  
ATTORNEYS.

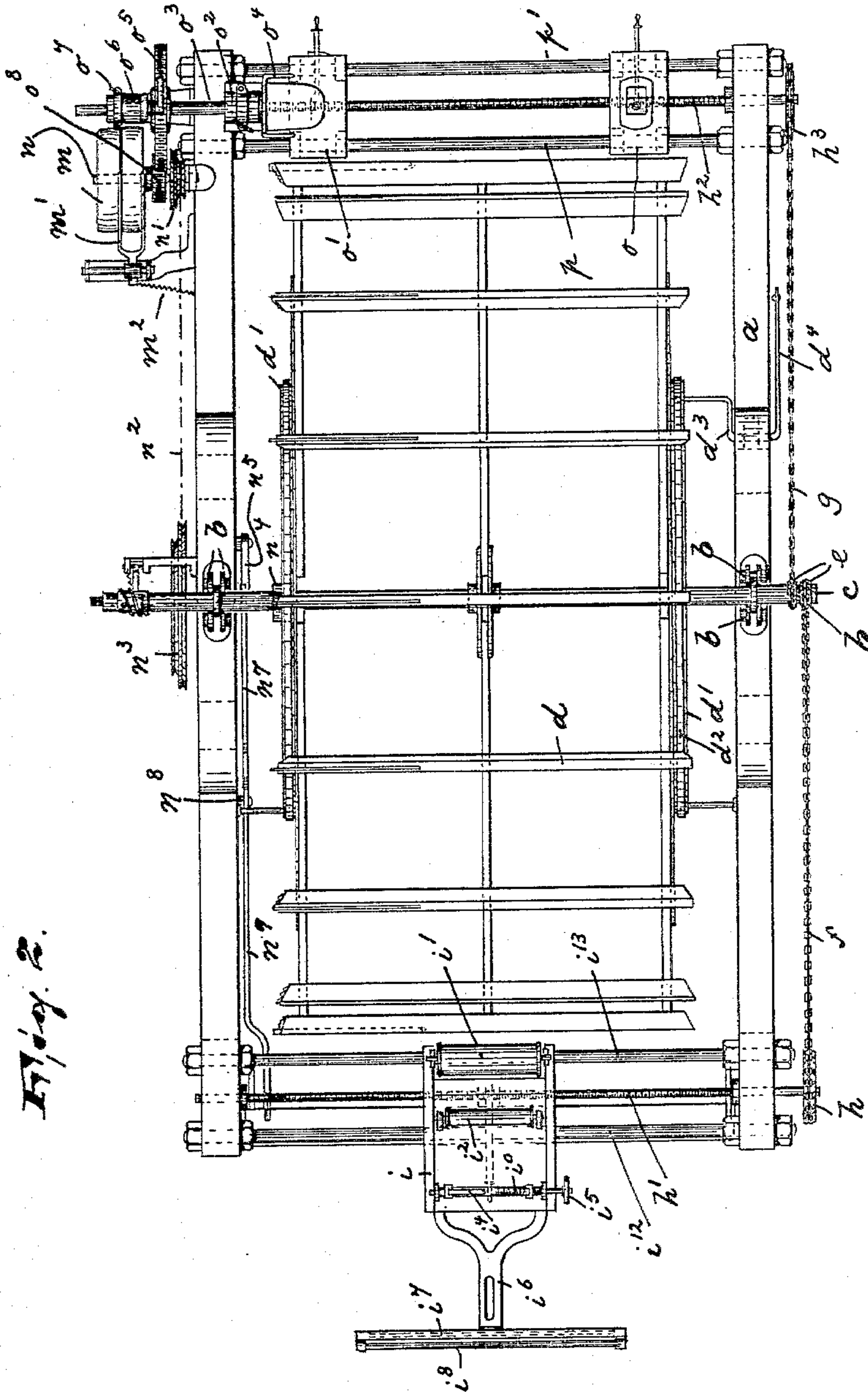
(No Model.)

3 Sheets—Sheet 2.

R. ATHERTON.  
WARPING MACHINE.

No. 597,871.

Patented Jan. 25, 1898.



WITNESSES:

INVENTOR:

Wm. D. Mrell.

Robert Atherton

Judson L. Mello

BY  
Eastman & Co.

ATTORNEYS.



(No Model.)

3 Sheets—Sheet 3.

R. ATHERTON.  
WARPING MACHINE.

No. 597,871.

Patented Jan. 25, 1898.

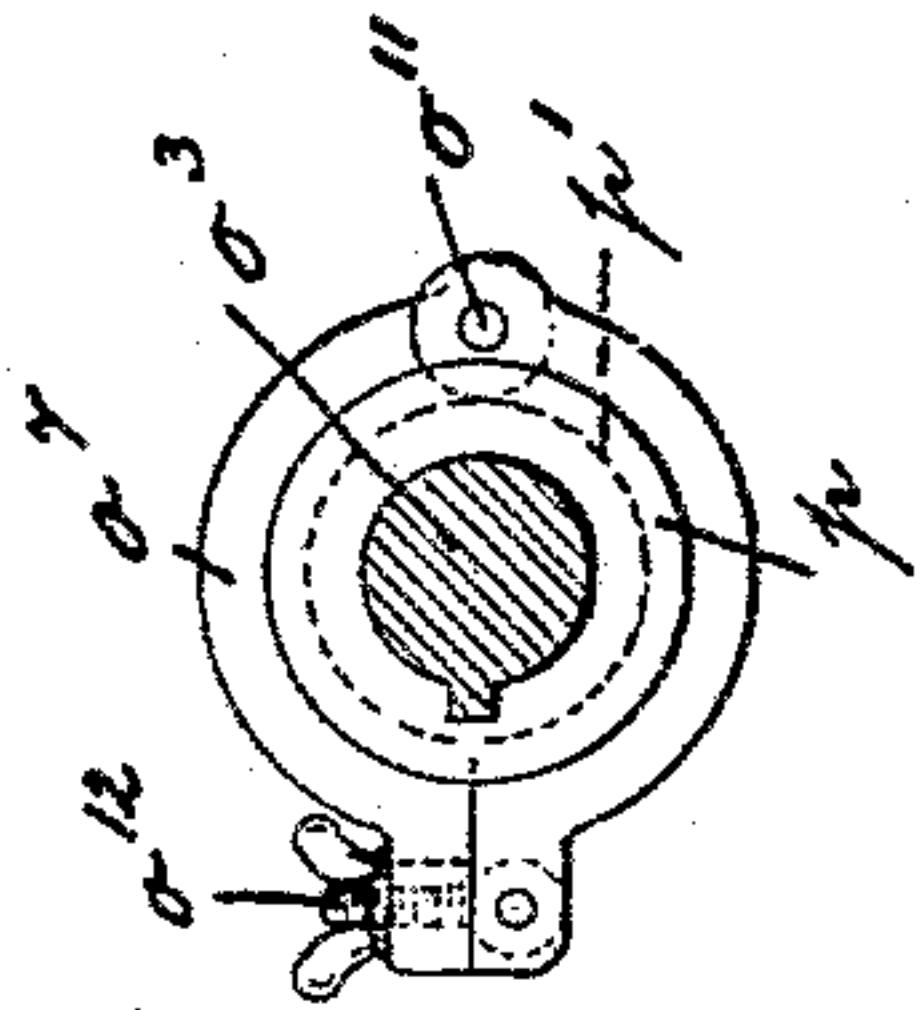


Fig. 5.

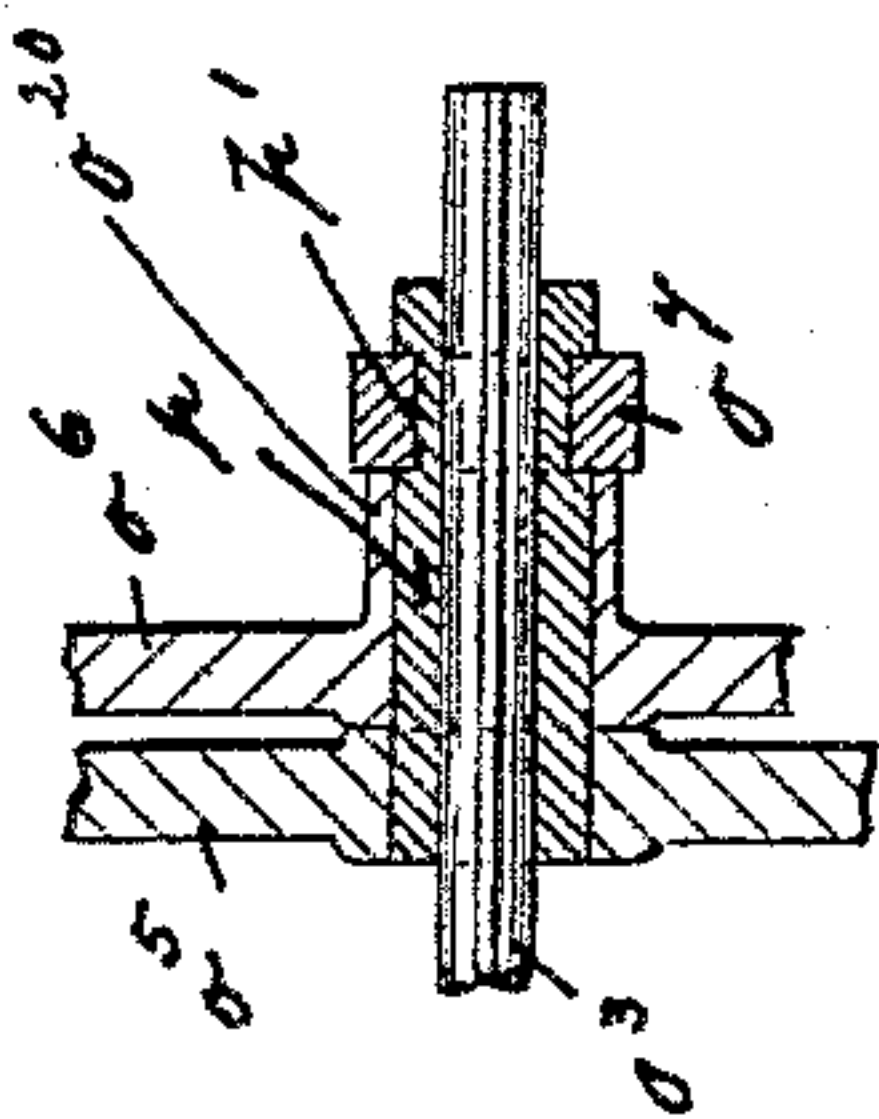


Fig. 4.

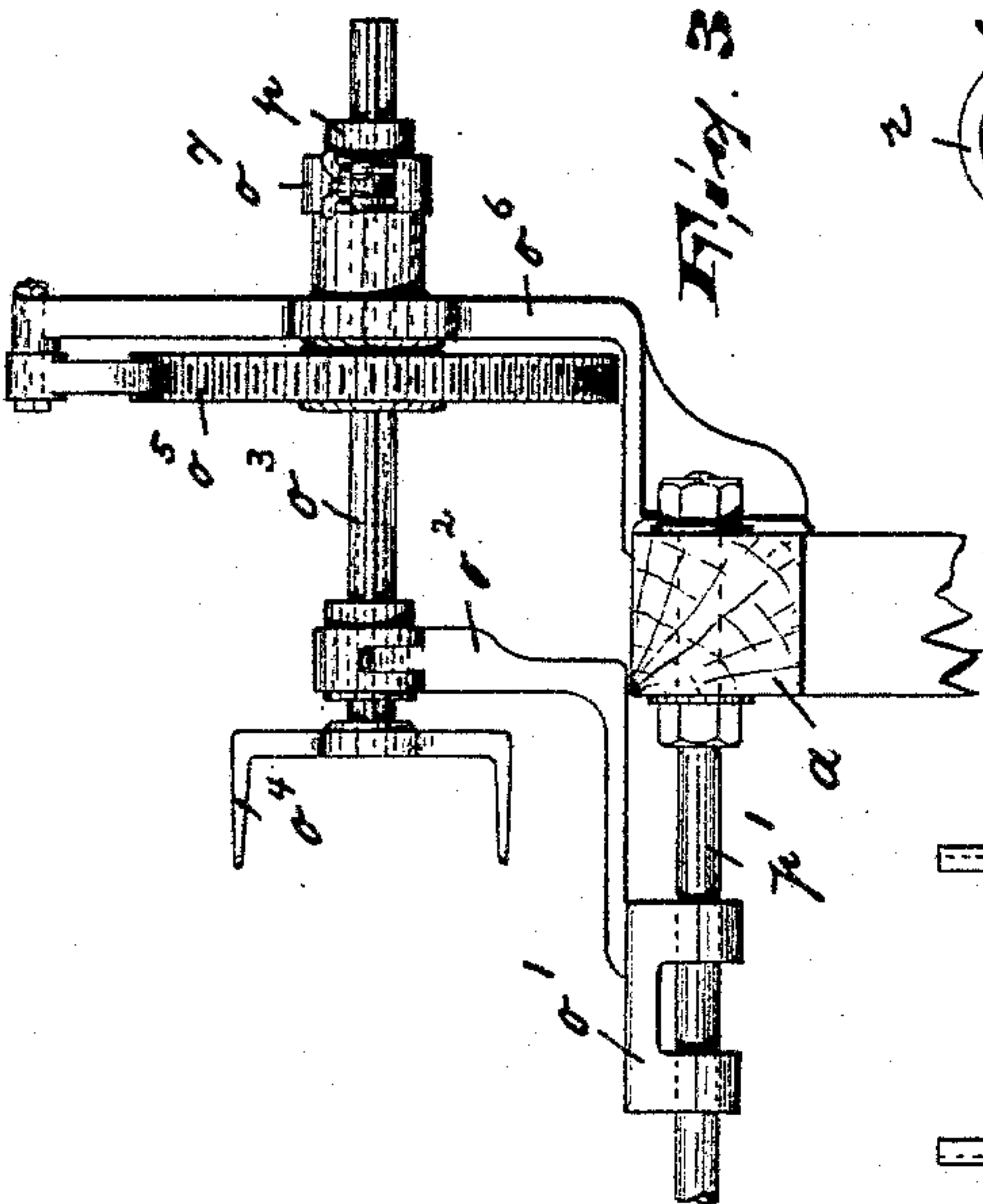


Fig. 3.

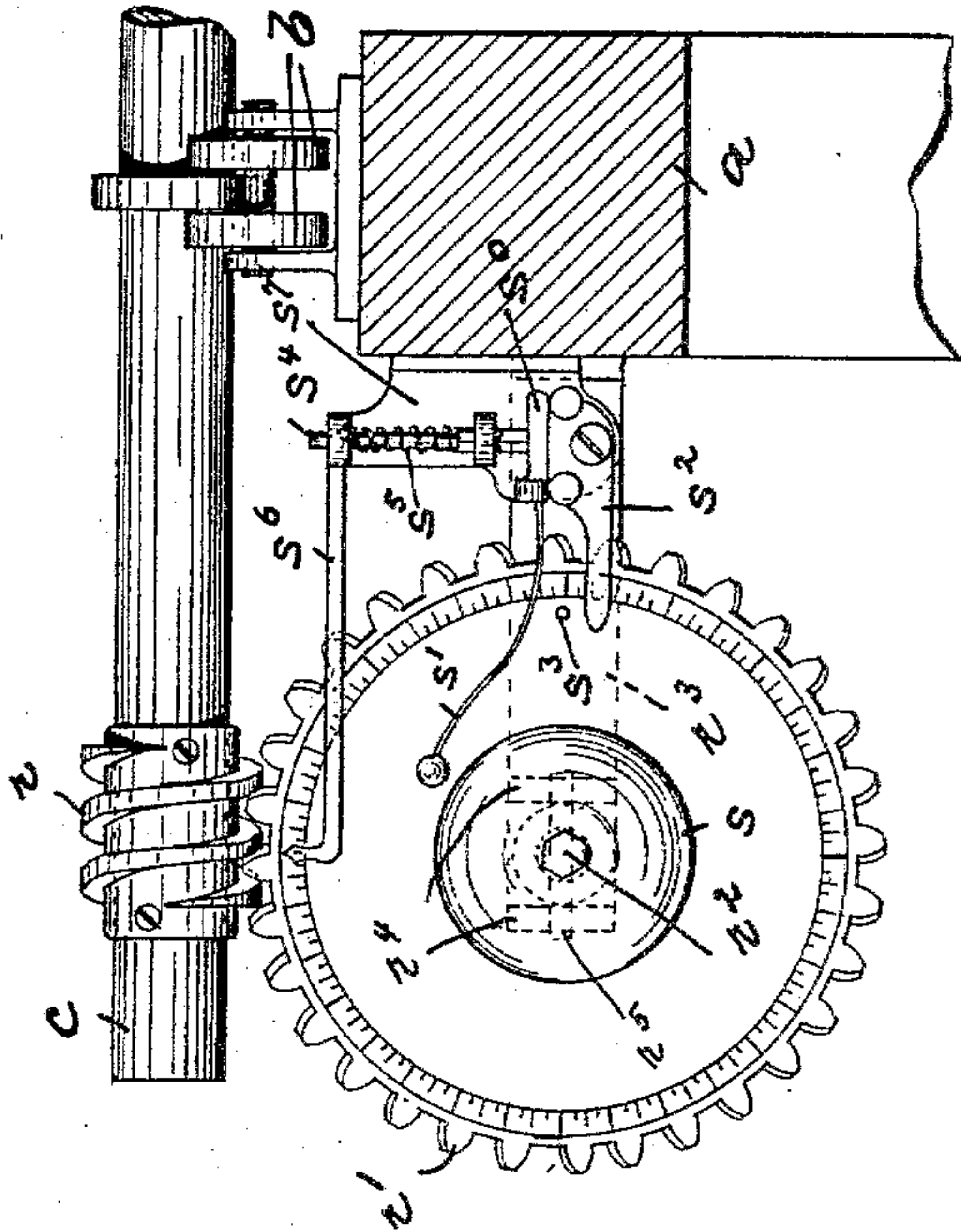


Fig. 2.

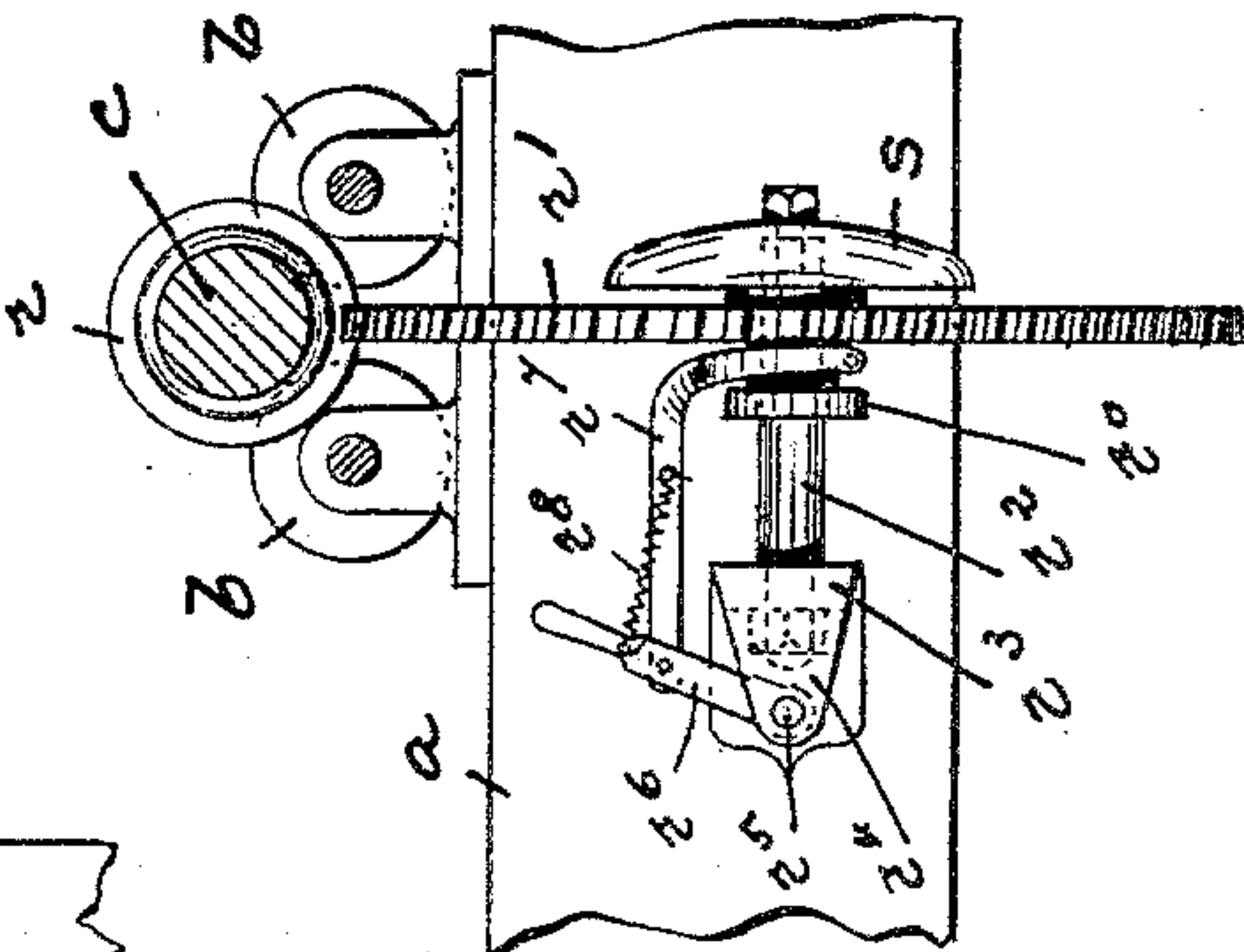


Fig. 8.

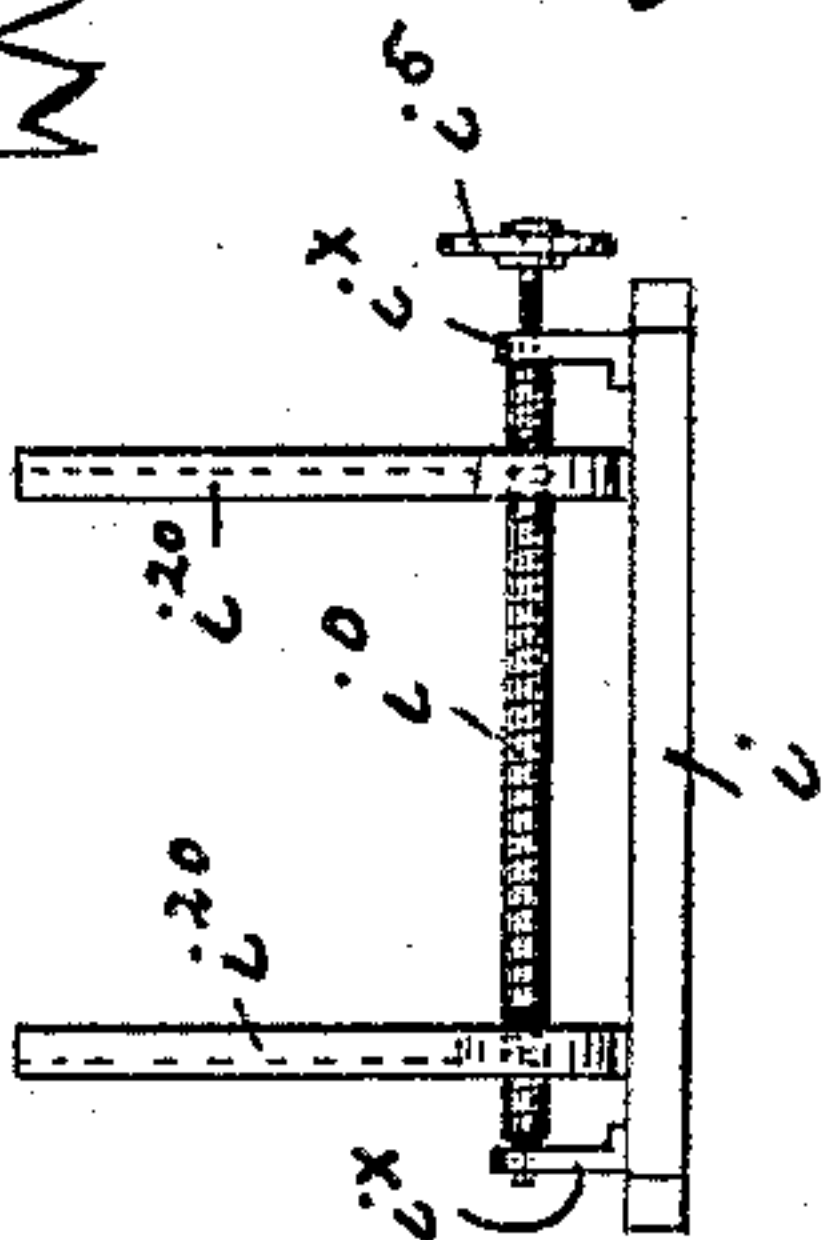


Fig. 6.

WITNESSES:

INVENTOR:

Wm. Drell.

Robert Atherton

Judson L. Males

BY Eastner & Co  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

ROBERT ATHERTON, OF PATERSON, NEW JERSEY.

## WARPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 597,871, dated January 25, 1898.

Application filed August 27, 1897. Serial No. 649,679. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT ATHERTON, a citizen of the United States, residing in Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Warping-Machines; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention relates to warping-machines and is an improvement on the one covered by United States Letters Patent No. 478,162, of July 5, 1892.

The object of the invention is to provide a warping-machine of simple, strong, and durable construction, reliable in operation, and wherein the beaming is greatly facilitated and accomplished in a perfect manner.

The invention consists in the improved warping-machine, in its reel operating and controlling mechanism, and in the combination and arrangements of the various parts, substantially as will be hereinafter more fully described, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several views, Figure 1 is a side elevation of my improved warping-machine; Fig. 2, a top plan view of Fig. 1; Fig. 3, an enlarged front elevation of the beam-driving mechanism; Fig. 4, a transverse sectional view through the latter; Fig. 5, an enlarged end elevation of Fig. 4, the shaft-supporting bracket and the gear-wheel on the same not being shown; Fig. 6, an enlarged front elevation of the reel-frame illustrated in the left-hand portions of Figs. 1 and 2; Fig. 7, an enlarged side elevation of the gong and indicator and its operating-shaft, and Fig. 8 a front elevation of Fig. 7.

In said drawings, *a* represents a warping-frame of ordinary construction and provided on each side with an upwardly-projecting frame *a'*, on which are mounted roller-bear-

ings *b b*, supporting the shaft *c*. On said shaft is secured the reel *d*, of ordinary and well-known construction and provided on each side with an annular ring or flange *d'*, engaged by a metal band *d<sup>2</sup>*, which latter is secured with one end to the frame *a* and with its other end to a fulcrum-lever *d<sup>3</sup>*, which in turn is controlled by a weighted arm *d<sup>4</sup>*, limited in its downward movement by a pin *d<sup>5</sup>*, inserted into one of a series of holes *d<sup>6</sup>*, arranged in the brace *a<sup>0</sup>* of the frame *a*, as clearly illustrated in Fig. 1 of the drawings.

The annular flange or ring *d'* of the reel *d* rests on a wheel or pulley *n<sup>4</sup>*, (from which it receives its motion,) which latter is secured on a shaft revolvably mounted in levers *n<sup>5</sup>*, pivotally secured, as at *n<sup>6</sup>*, to the frame *a*. On the shaft of said wheel or pulley is also secured a double-grooved pulley *n<sup>3</sup>*, connected by a chain or belt *n<sup>2</sup>* with a double-grooved pulley *n'*, the latter being mounted on the driving-shaft *n*, carrying the loose and fixed pulleys *m*, adapted to be operated by a belt, as in the usual manner. A belt-shifter *m'*, held in normal position by a spiral spring *m<sup>2</sup>*, is slidably arranged in close proximity with its loose and fixed pulleys *m* and is adapted to be controlled by the fulcrum-lever *m<sup>3</sup>*, operated from the foot-treadle *m<sup>5</sup>* by an intermediate cord or chain *m<sup>4</sup>*. The shaft carrying the double-grooved pulley *n<sup>3</sup>* is held in frictional contact with the ring or flange *d'* by the free end *n<sup>7</sup>* of a lever *n<sup>9</sup>*, pivotally secured, as at *n<sup>8</sup>*, to the frame *a* and having its other end connected by a left and right hand screw *n<sup>10</sup>* to a foot-treadle *n<sup>11</sup>*. The central portion of said foot-treadle is also connected to the free end of said lever *n<sup>9</sup>* by means of a cord or chain *n<sup>12</sup>*, passing over intermediate pulleys *n<sup>13</sup>* and *n<sup>14</sup>*, and thus providing additional means for operating the said lever, as will be manifest.

On one end of the shaft *c* of the reel *d* are mounted two sprocket-wheels *e*, connected by sprocket-chains *f* and *g* with sprocket-wheels *h* and *h<sup>3</sup>*, mounted, respectively, on the projecting ends of the endless screws *h'* and *h<sup>2</sup>*, which latter are parallel with the shaft *c*, and in rear and front of the reel *d*.

On the screw *h'* is mounted, by means of a



pivoted lever  $i^{10}$ , (see Fig. 3 of Patent No. 478,162,) the reed-frame  $i$ , having additional bearings on the parallel rods  $i^{12}$  and  $i^{13}$  and carrying guide-rollers  $i'$   $i^2$  and an intermediate guide-plate  $i^3$ , and in rear of roller  $i^2$  a reed  $i^4$ . Said reed  $i^4$  is arranged in grooved standards  $i^{20}$ , slidably arranged on the reed-frame  $i$  and operated by a screw  $i^0$  with a hand-wheel  $i^5$ , which screw has its bearings in brackets  $i^x$ , as clearly illustrated in Fig. 6 of the drawings. On a projecting arm  $i^6$  of the reed-frame  $i$  is secured a reed  $i^7$  and guide-bar  $i^8$ . On the screw  $h^2$  are mounted beaming-frames  $o$  and  $o'$ , having additional bearings on the parallel rods  $p$  and  $p'$ , adapted to carry a beam, as in the usual construction.

In the upwardly-projecting portion  $o^2$  of the beaming-frame  $o'$  and in an auxiliary bracket  $o^6$ , projecting outwardly from the side piece of the frame  $a$ , as shown in Fig. 3, is mounted a mandrel or shaft  $o^3$ , which shaft is either provided with a key or feather or is polygonal-shaped and penetrates a sleeve  $p$ , journaled in the bracket-frame  $o^6$  and carrying a pawl-controlled gear-wheel  $o^5$ , meshing with the pinion  $o^8$  on the shaft  $n$ . The fact that the bracket  $o^6$  projects outwardly from the side piece of the frame and supports the mandrel and gear  $o^5$  outside of said frame makes possible a greater lateral movement toward the bracket on the part of the beaming-frame  $o'$ . Said sleeve is provided near its outer portion with an annular groove  $p'$ , in which is arranged a clamp  $o^7$ , consisting of two halves pivotally connected, as at  $o^{11}$ , and having their opposite ends adjustably secured together by means of a clamping-screw  $o^{12}$ . Said clamp  $o^7$  bears against the projecting sleeve  $o^{20}$  of the auxiliary bracket  $o^6$  and thus prevents lateral movement of the sleeve  $p$ , all as clearly shown in Figs. 3, 4, and 5 of the drawings.

The mandrel or shaft  $o^3$ , which is hollowed out at its inner portion, as illustrated in dotted lines in Fig. 3, carries the clutch  $o^4$ , for a purpose manifest to those familiar with the art.

On one end of the shaft  $c$  is secured a worm  $r$ , engaging the graduated gear-wheel  $r'$ , provided with a grooved collar  $r^0$  and slidably arranged on the stub-shaft  $r^2$  at right angles to the shaft  $c$  and supported in the bracket-frame  $r^3$ . To projecting lugs  $r^4$  of said bracket-frame  $r^3$  is secured a pin  $r^5$ , serving as fulcrum for the hand-lever  $r^6$ , carrying a forked lever  $r^7$ , which latter engages with its forked portion the grooved collar  $r^0$ , while its free end is pivotally connected to the fulcrum-lever  $r^6$ . A spiral spring  $r^8$  is connected to said fulcrum-lever  $r^6$  and the forked lever  $r^7$  and serves to control the relative position of the two levers, as will be manifest.

On the free end of the stub-shaft  $r^2$  is secured a gong  $s$ , adapted to be sounded by the

hammer  $s'$ , projecting from the shoe  $s^0$ , which latter rests upon and is operated by the fulcrumed arms  $s^2$ , in turn operated by a pin  $s^3$ , projecting from the gear-wheel  $r'$ . The shoe  $s^0$  is connected with an upwardly-projecting rod or shaft  $s^4$ , controlled by a spiral spring  $s^5$  and slidably arranged in a bracket-frame  $s^7$ , which latter also serves as fulcrum for the arm  $s^2$  and carries the indicator  $s^6$ , all as clearly illustrated in Figs. 7 and 8.

The operation of the machine is obvious, especially when reference is made to the United States Letters Patent above referred to, and it only needs to be remarked that by the various changes in my present application the warping-machine is perfected and rendered more reliable, efficient, and regular in its operation.

In a copending application filed November 30, 1897, I have described and claimed the indicating device shown in Figs. 7 and 8 of the accompanying drawings of this application, and also herein described. I therefore make no claim to said indicating device in this my present application.

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

1. In a warping-machine, the combination with the frame, of a shaft journaled in said frame, a reel mounted on said shaft and provided with an annular ring or flange, a band engaging said flange and secured with one end to the frame, a fulcrumed lever having its free end connected with the other end of said band, a weighted arm controlling said fulcrumed lever, a wheel or pulley below the shaft of the reel and bearing against its annular flange or ring, a shaft carrying said wheel or pulley, a fulcrumed lever or levers furnishing bearings for said shaft, a fulcrumed lever bearing with its inner free end against the under side of said wheel-carrying shaft, a foot-treadle pivotally connected to the frame, a left and right hand screw connecting said foot-treadle with the free end of the last-mentioned fulcrumed lever, and means for transmitting motion to the wheel or pulley carrying shaft, substantially as and for the purposes described.

2. In a warping-machine, the combination with the frame, of a reel journaled in said frame and provided on one or both sides with an annular flange or ring, means mounted on said frame for guiding the threads onto said reel and situated on one side thereof, warping means also mounted on said frame and situated on the other side of said reel, a band engaging said flange and secured with one end to the frame, a fulcrumed lever having its free end connected with the other end of said band, a weighted arm controlling said fulcrumed lever, a wheel or pulley below the shaft of the reel and bearing against its annular flange or ring, a shaft carrying said



wheel or pulley, a fulcrumed lever bearing  
with its inner free end against the under side  
of said wheel-carrying shaft, a foot-treadle  
pivotally connected to the frame, and a left  
5 and right hand screw connecting said foot-  
treadle with the free end of the last-mentioned  
fulcrumed lever, substantially as described.

In testimony that I claim the foregoing I  
have hereunto set my hand this 18th day of  
August, 1897.

ROBERT ATHERTON.

Witnesses:

ALFRED GARTNER,  
FRANK ATHERTON.