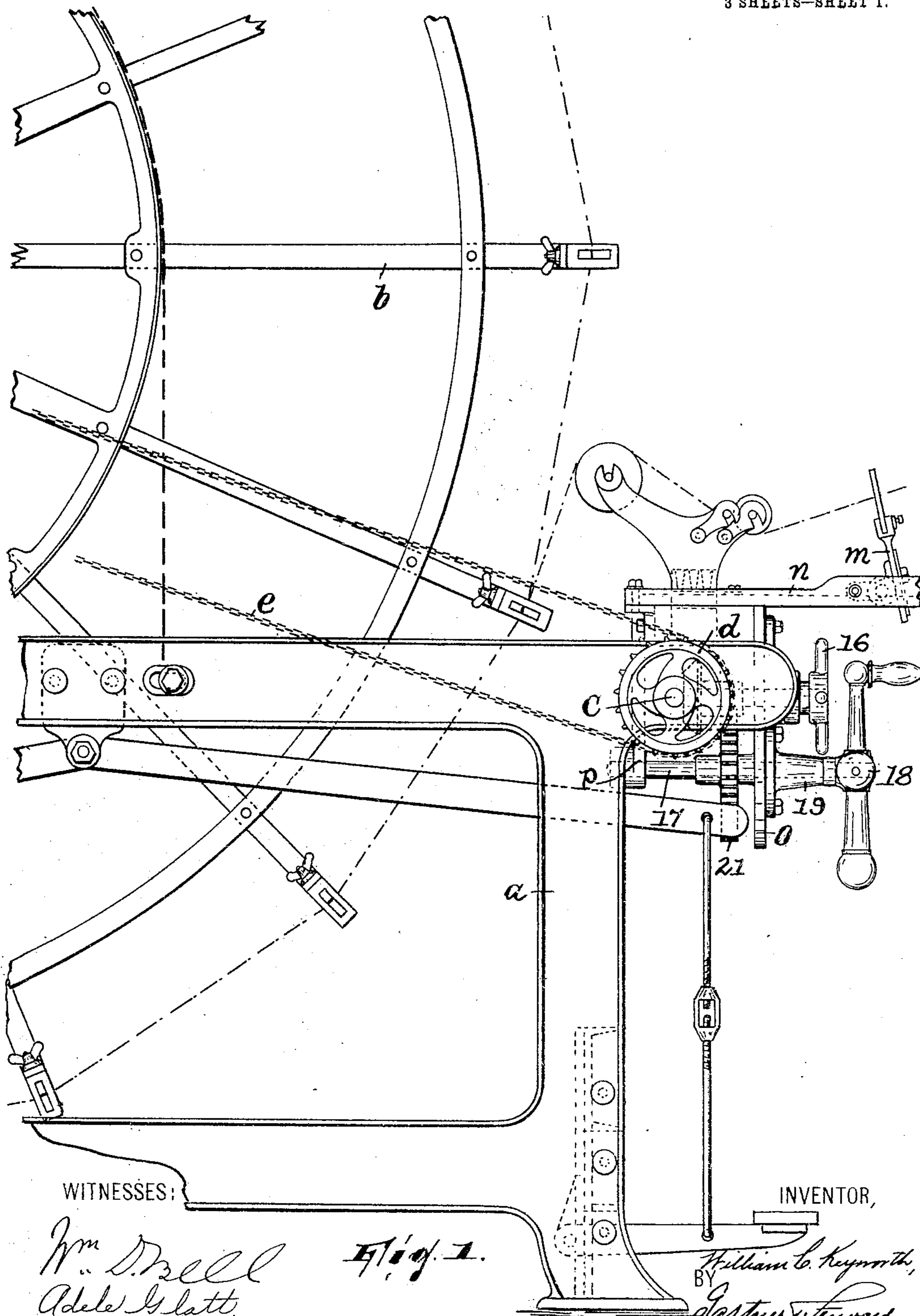


No. 803,491.

PATENTED OCT. 31, 1905.

W. C. KEYWORTH.  
WARPING MACHINE.  
APPLICATION FILED MAY 19, 1905.

3 SHEETS—SHEET 1.



WITNESSES:

*Wm. D. Bell*  
*Adele G. Latt*

*Fig. 1.*

INVENTOR,

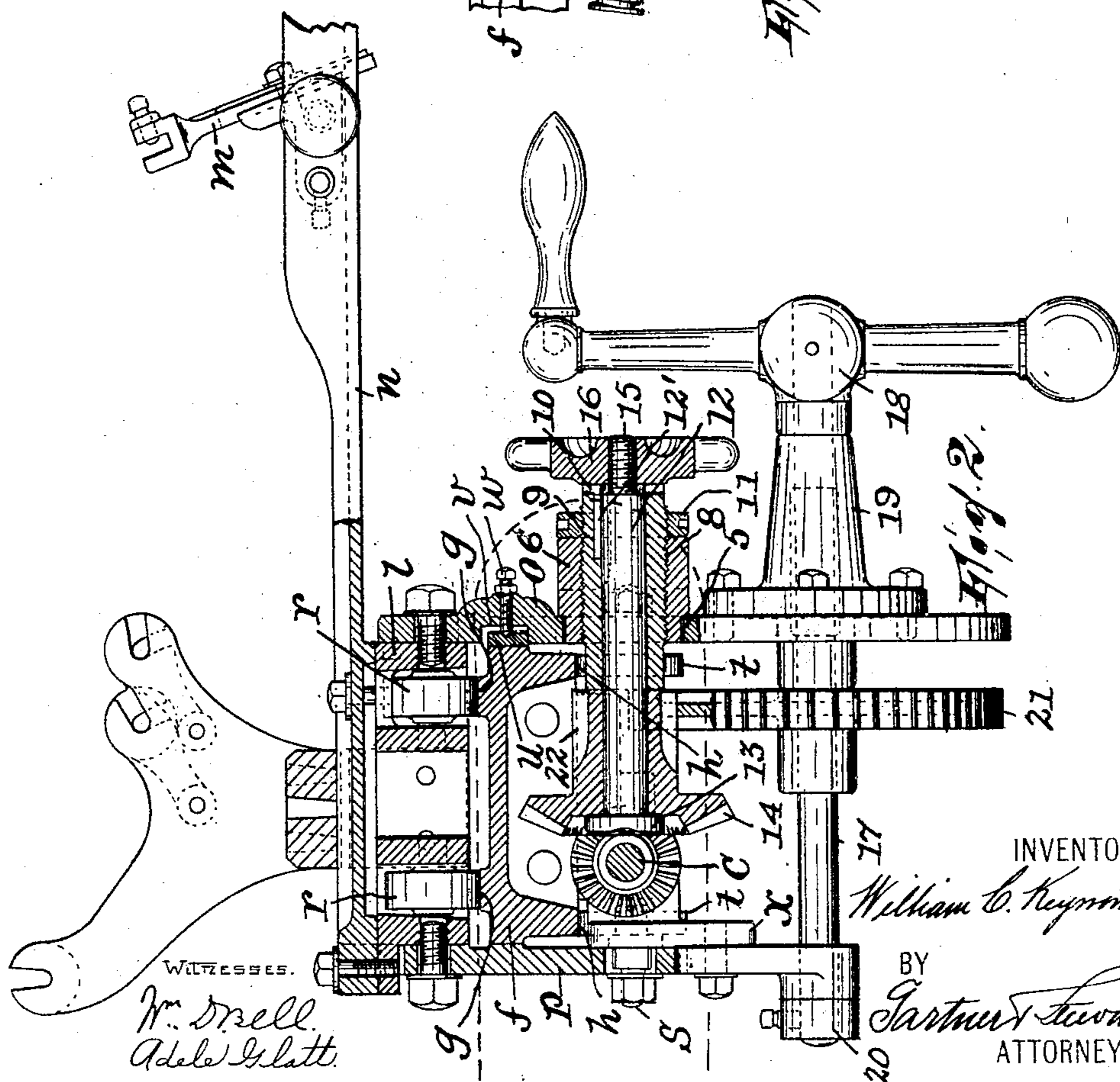
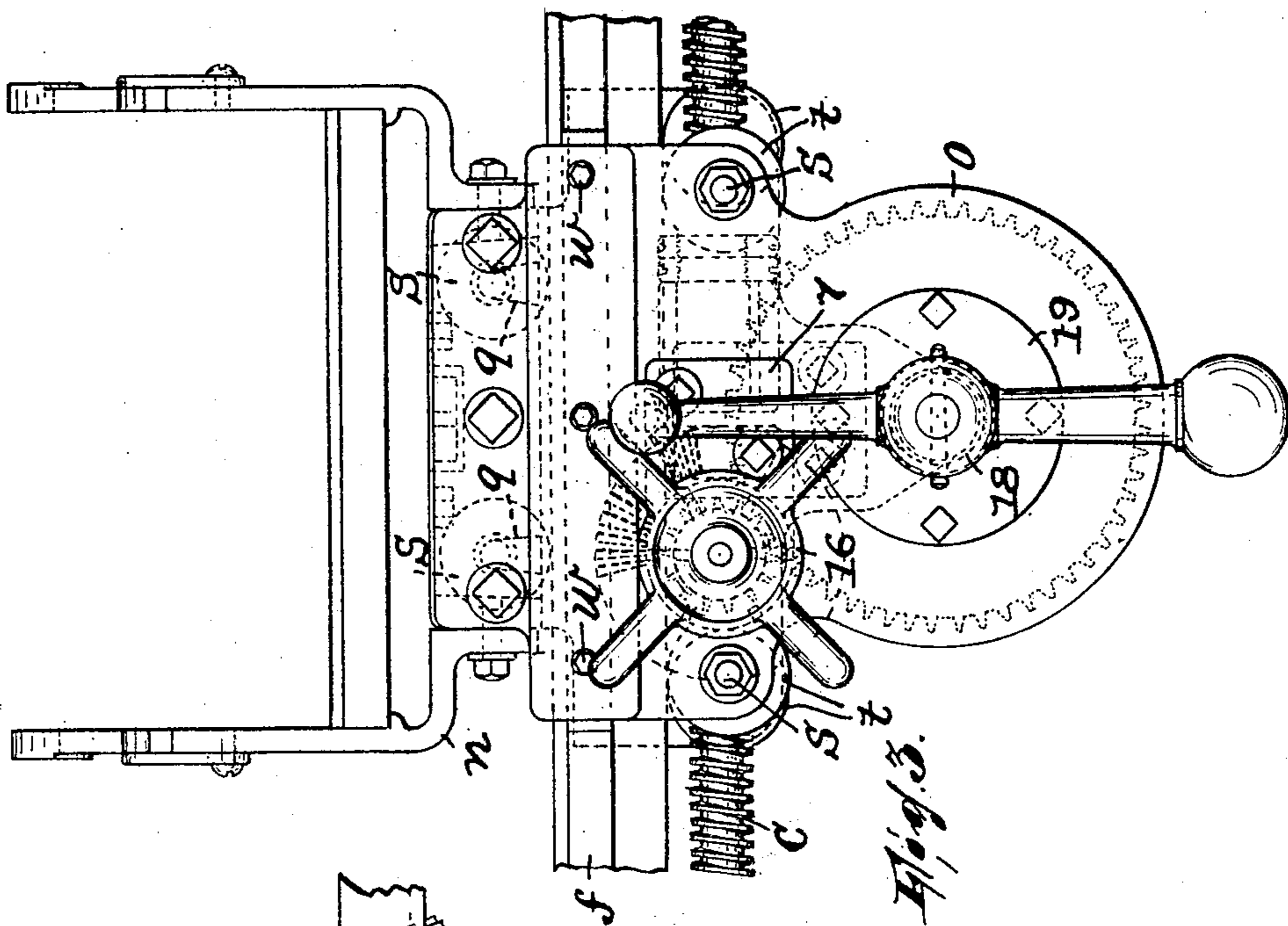
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ATTORNEYS.


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3 SHEETS--SHEET 2.



WITNESSES.   
Wm. Drrell.  
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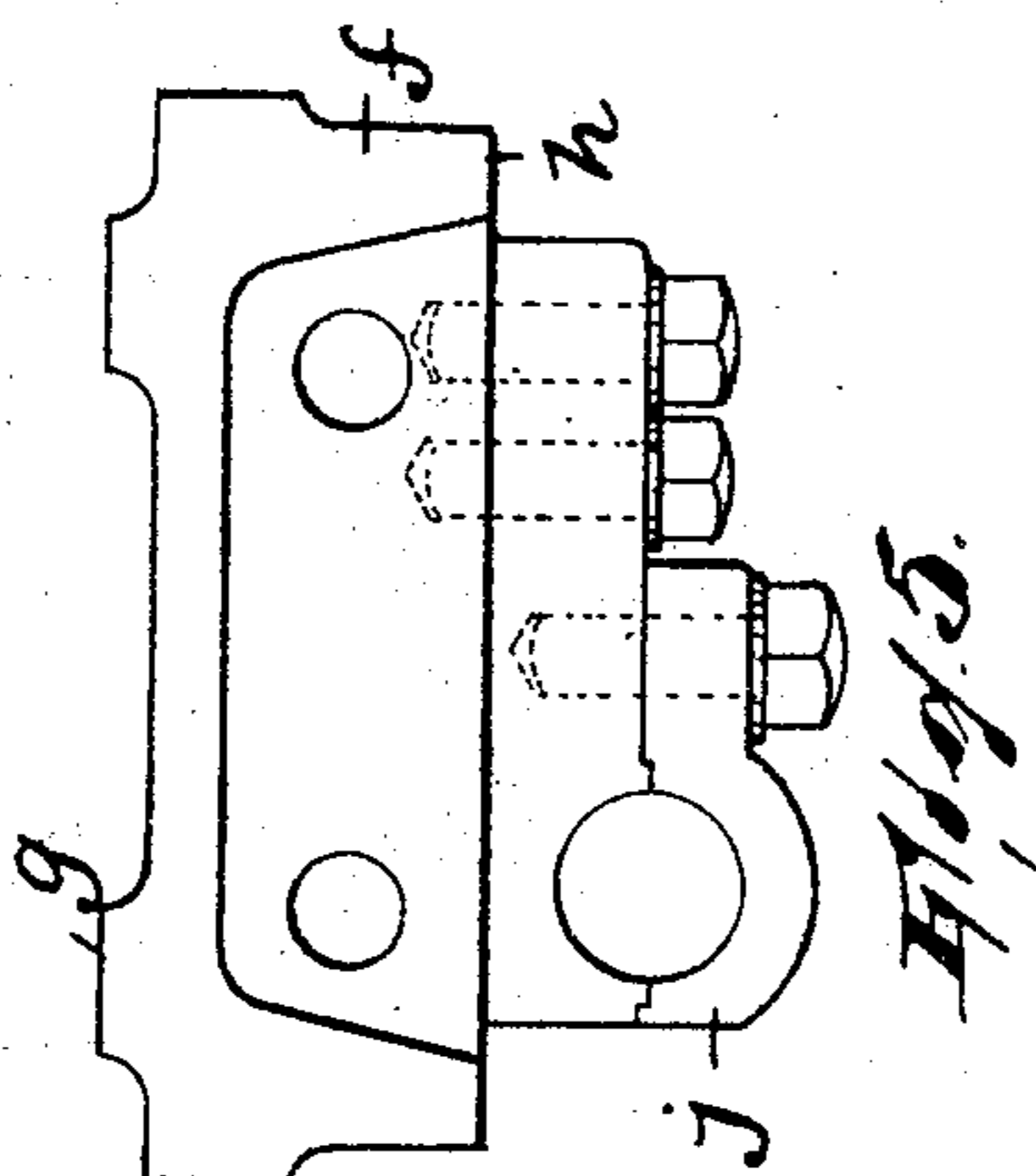
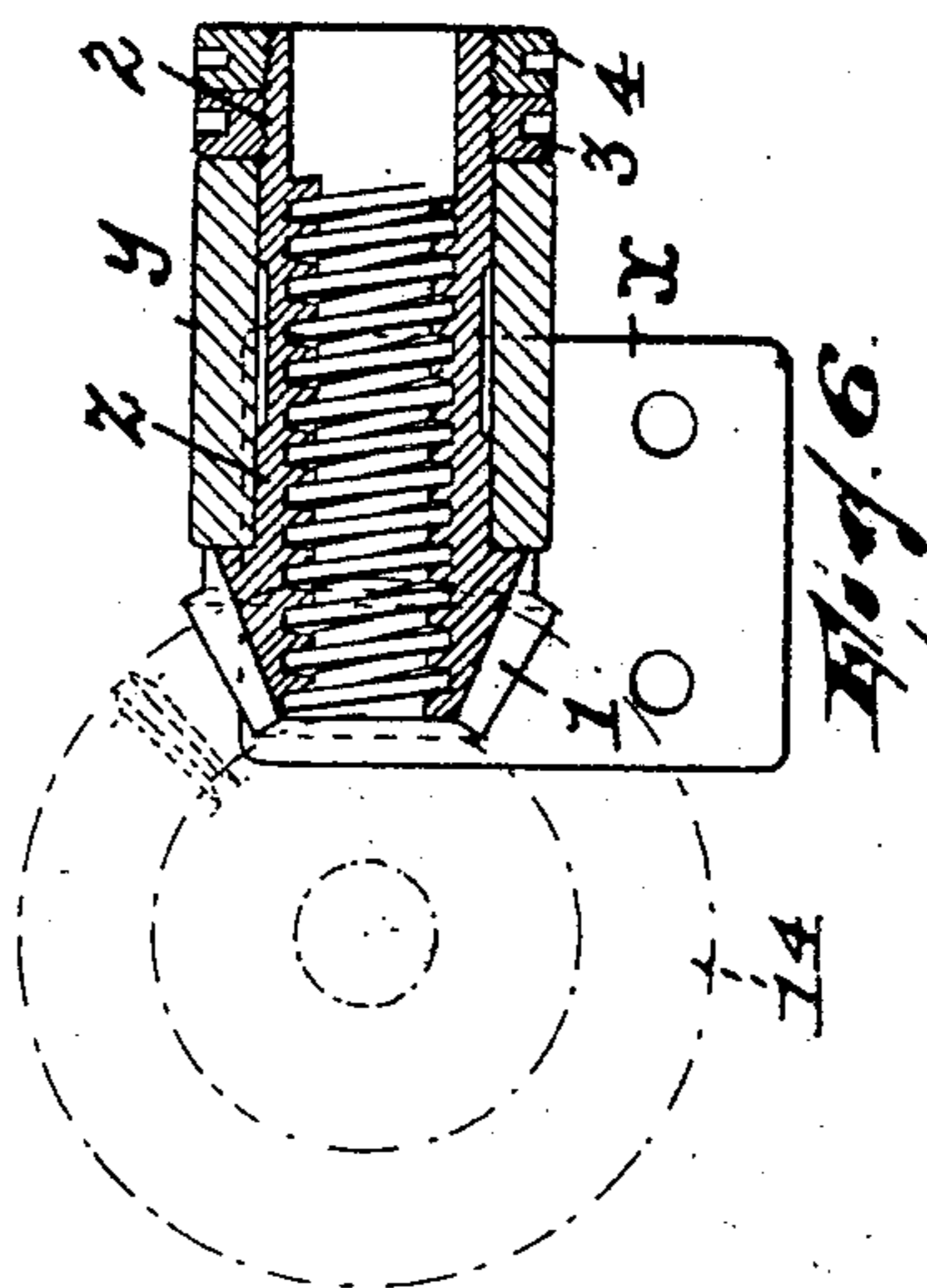
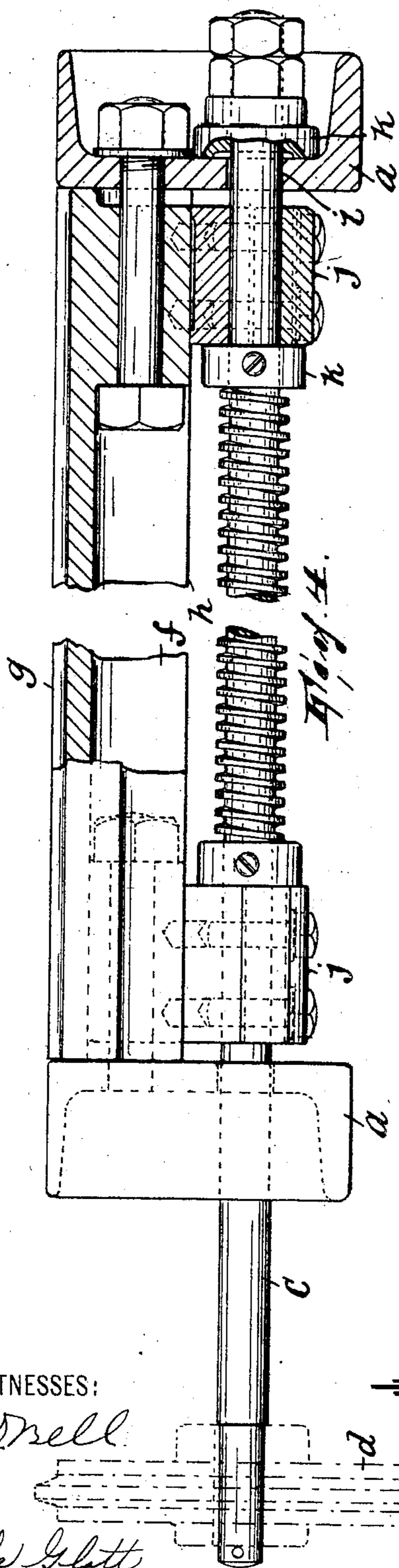
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WARPING MACHINE.

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3 SHEETS—SHEET 3.



WITNESSES:

Wm. Drell

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INVENTOR,

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BY

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# UNITED STATES PATENT OFFICE.

WILLIAM C. KEYWORTH, OF PATERSON, NEW JERSEY, ASSIGNOR TO  
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## WARPING-MACHINE.

No. 803,491.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed May 19, 1905. Serial No. 261,174.

*To all whom it may concern:*

Be it known that I, WILLIAM C. KEYWORTH, a citizen of the United States, residing in Paterson, Passaic county, 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 and figures of reference marked thereon, which form a part of this specification.

My invention relates to warping-machines, and particularly to that class of such machines in which sections of warp are successively laid on the reel side by side. This class of warping-machines requires a reed-carriage which not only feeds laterally automatically, but must be capable of being moved laterally manually from time to time as one section of warp is completed and a new one is to be begun. My invention is an improved means for transmitting lateral movement to the carriage, which when it is operated automatically will do so with a regular uniform movement, so that the material is gradually and smoothly laid on the reel, and which when it is manually operated to shift it to a new position will respond readily and quickly to the means for effecting this.

In the accompanying drawings, Figure 1 is a side elevation of so much of a warping-machine provided with my improvement as it is necessary to show in order to illustrate said improvement. Fig. 2 is a view, partly in side elevation and partly in vertical section, of that portion of the machine which my improvement immediately involves. Fig. 3 is a view in front elevation of what is seen in Fig. 2. Fig. 4 is a view, partly in front elevation and partly in section, of certain parts seen in Figs. 2 and 3. Fig. 5 is a view in end elevation of certain parts seen in Fig. 4, and Fig. 6 illustrates a detail.

In said drawings, *a* is the frame, *b* the reel, which may be rotated by any suitable means, and *c* is a rotary screw carrying a sprocket-wheel *d*, by which and a chain *e*, passing over said sprocket-wheel and over another sprocket-wheel (not shown) on the reel, said shaft *c* is rotated. A rail *f*, having runways

*g* and *h* on its top and bottom surfaces, respectively, may constitute a portion of the frame *a*, being bolted between the two side portions thereof (seen in Fig. 1) over the screw *c*, which screw penetrates holes *i* in the side portions of the frame, and is journaled in bearings *j*, depending from the rail.

*k* designates suitable devices for preventing endwise thrusts of the screw *c*.

*l* is the reed-carriage, and *m* is its reed-carrying bracket, which latter may be of any suitable form and is mounted in a frame *n*, which forms a part of said carriage.

*o* and *p* are front and rear aprons bolted to the front and rear faces, respectively, of the carriage and depending downwardly therefrom. In vertical slots *q* in the carriage are journaled the trunnions of antifriction-rollers *r*, which rest on the runways *g* and on suitable bolts *s*. In the aprons *o* and *p* are journaled other antifriction-rollers *t*, which take against the runways *h* and prevent upward displacement of the carriage.

*u* is simply a lining-strip set in a groove *v* in the back of the apron *o* and bearing against the front of the rail *f*, it being adapted to prevent undue horizontal play of the carriage. *w* represents screws for adjusting said lining-strip.

To the front face of the apron *p* is bolted a bracket *x*, comprising an integral sleeve *y*, which is penetrated by the screw *c*. The sleeve *y* forms a bearing for a nut *z*, which is arranged on the screw and is provided at one end with a bevel-pinion 1 and at the other end is externally threaded, as at 2. The bevel-pinion 1 forms a shoulder which coacts with a nut 3, screwed onto the threaded portion of nut *z* to prevent longitudinal movement of the latter in its bearings.

4 is a lock-nut for nut 3.

The apron *o* is formed with an opening 5, which receives the inner end of a bushing 6, formed integrally with a plate 7, bolted to the apron. The bushing is internally threaded, as at 8, and has screwed into it an externally-threaded sleeve 9. This sleeve may be adjusted by turning it in the bushing-spanner, which may engage in holes 10 therein. When so adjusted, it may be secured by a lock-nut 11, screwed on the sleeve and taking against the bushing. Sleeve 9 is axially penetrated by a bolt 12, which is

keyed thereto, as at 12', and on which at its inner end, between the head 13 thereof and the end of sleeve 9, a bevel-pinion 14, meshing with the bevel-pinion 1, is arranged. The other end of the bolt has a threaded extension 15, onto which is screwed a nut 16, adapted to be manipulated by hand.

17 is a shaft journaled in the aprons *o* and *p* and carrying a crank 18. The crank 18 takes against a boss 19, secured to the apron *o*, and thus coacts with a collar 20, secured on the shaft and taking against the rear face of the apron *p* to prevent endwise movement of the shaft.

21 is a gear which is fixed on shaft 17 and meshes with gear-teeth 22, formed in the hub portion of the bevel-pinion 14.

In view of the foregoing it will be obvious that the lateral movement of the carriage by the rotation of the screw or manually is dependent upon whether or not the bevel-pinion 14 is held against rotation in the carriage. If the nut 16 is manipulated so that the bevel-pinion 14 is clamped by the bolt 12 between the latter's head and the end of the sleeve 9, the bevel-pinion will be held against rotation, as will also the nut *z*, with the bevel-pinion portion of which the bevel-pinion 14 is in mesh. The rotation of the screw *c* in the nut *z*, thus fixed in the carriage, will result in the latter moving laterally automatically on the rail *f'* as a guide. If the nut 16 is manipulated to loosen up the bolt 12, and so release the bevel-pinion 14, the crank 18 may be turned and power transmitted therefrom, through shaft 17, gear 21, and bevel-pinion 14, to the nut *z* to turn the same on the screw and cause it to feed along the screw, and so move the carriage.

My present arrangement not only reduces to the minimum the number of parts necessary to give to the machine the functions aimed at, but practically eliminates the lost motion or backlash which is usually an incident to the operation of previous mechanisms of this nature. Whatever wear may accrue in the bevel-pinions 1 and 14 may be taken up from time to time by adjusting the sleeve 9.

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

1. The combination, with the frame having a guideway, of a carriage arranged to move on said guideway, a rotatable screw journaled in said frame, a nut movable with the carriage, arranged on said screw and formed with gear-teeth, a rotatable pinion also movable with the carriage and meshing with the gear-teeth on said nut, and means for locking the pinion against, or releasing it for, rotary movement in the carriage, substantially as described.

2. The combination, with the frame hav-

ing a guideway, of a carriage arranged to move on said guideway, a rotatable screw journaled in said frame, a nut movable with the carriage, arranged on said screw and formed with gear-teeth, a sleeve arranged in the carriage, a rotatable pinion meshing with the gear-teeth on said nut, and means for clamping the pinion against the sleeve and so locking the same, at will, against rotation, substantially as described.

3. The combination, with the frame, having a guideway, of a carriage arranged to move on said guideway, a rotatable screw journaled in said frame, a nut movable with the carriage, arranged on said screw and formed with gear-teeth, a sleeve arranged in the carriage, a rotatable pinion meshing with the teeth on said nut, and means comprising a part forming a journal for the pinion for clamping the pinion against the sleeve and so locking the same, at will, against rotation, substantially as described.

4. The combination, with the frame, having a guideway, of a carriage arranged to move on said guideway, a rotatable screw journaled in said frame, a nut movable with the carriage, arranged on said screw and formed with gear-teeth, a sleeve adjustably arranged in the carriage, a rotatable pinion meshing with the teeth on said nut, and means comprising a part forming a journal for the pinion for clamping the pinion against the sleeve and so locking the same, at will, against rotation, substantially as described.

5. The combination, with the frame having a guideway, of a carriage arranged to move on said guideway, a rotatable screw journaled in said frame, a nut movable with the carriage, arranged on said screw and formed with gear-teeth, a sleeve arranged in the carriage, a bolt penetrating the sleeve, a pinion journaled on the bolt at one end of said sleeve and meshing with the gear-teeth on said nut, and a nut screwed on the bolt at the other end of said sleeve, substantially as described.

6. The combination, with the frame having a guideway, of a carriage arranged to move on said guideway, a rotatable screw journaled in said frame, a nut movable with the carriage, arranged on said screw and formed with gear-teeth, a rotatable pinion meshing with the gear-teeth of said nut, and means, comprising a part forming a bearing for the pinion, for locking the pinion against, or releasing it for, rotary movement in the carriage, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of May, 1905.

WILLIAM C. KEYWORTH.

Witnesses:

JOHN W. STEWARD,  
WM. D. BELL.