G. SIPP.

WARPING MACHINE.

APPLICATION FILED DEC. 3, 1908.

940,080.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 1.

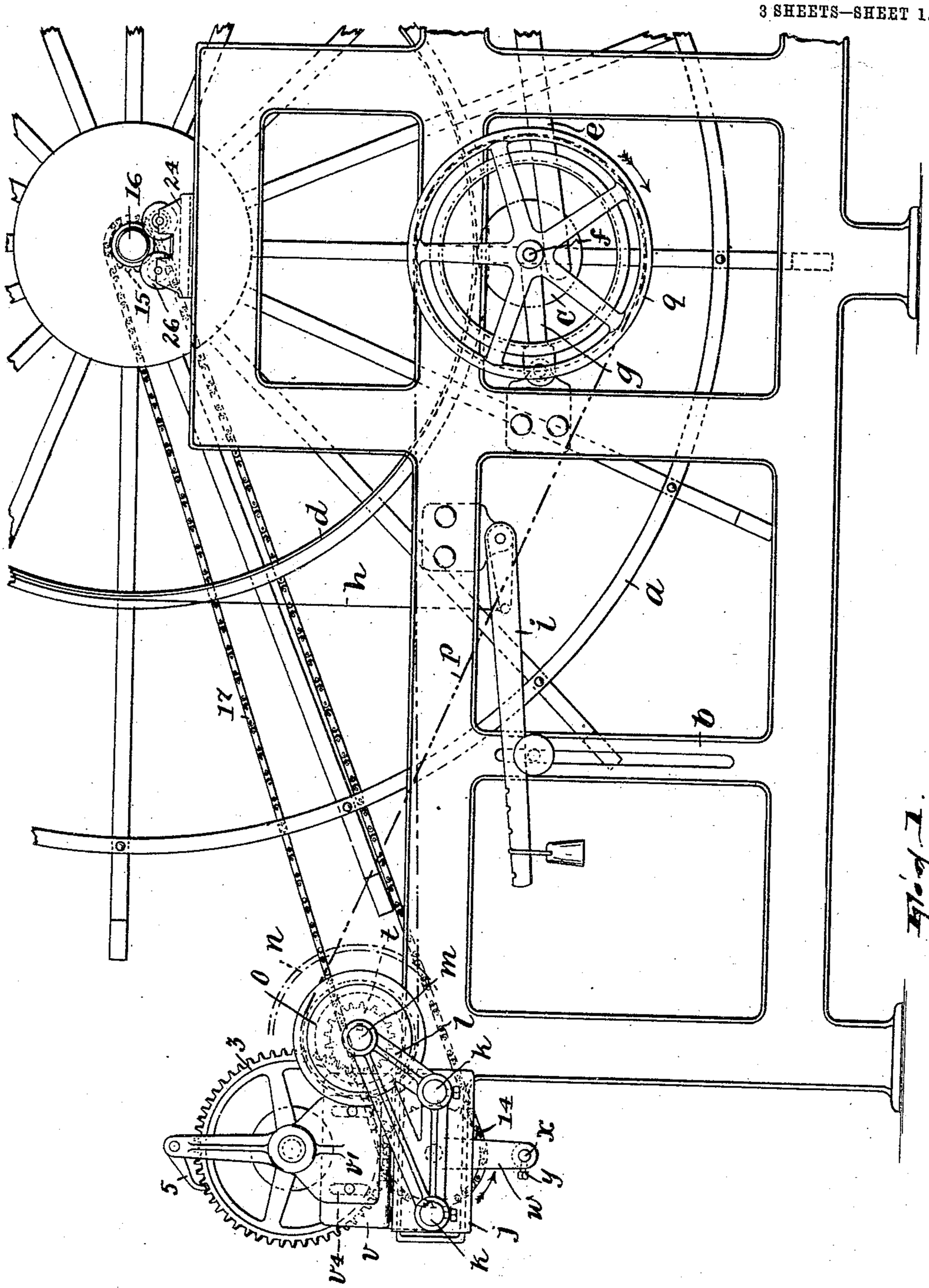

Fig. 1.

WITNESSES

Wm. D. Bell.

Clara Kaufmann.

INVENTOR,

Grant Sipp,

BY

John W. Howard,

ATTORNEY.

940,080.

G. SIPP.

WARPING MACHINE.

APPLICATION FILED DEC. 3, 1908.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 2.

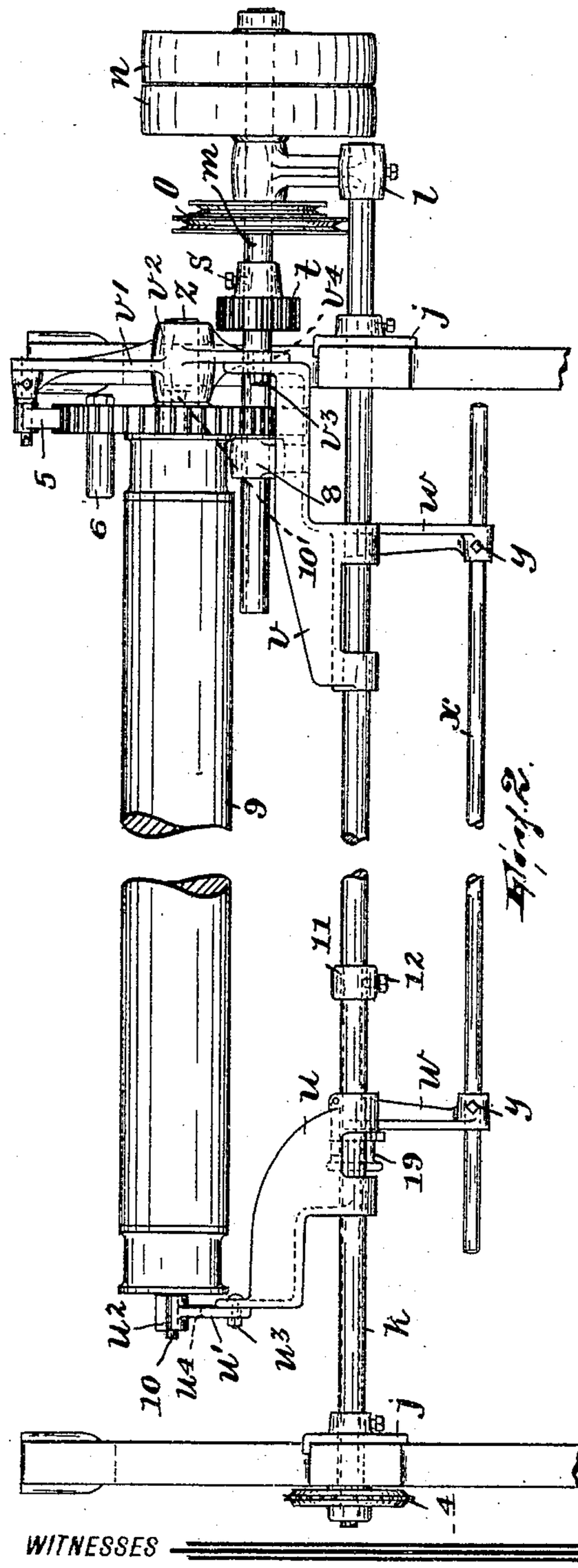

Fig. 2.

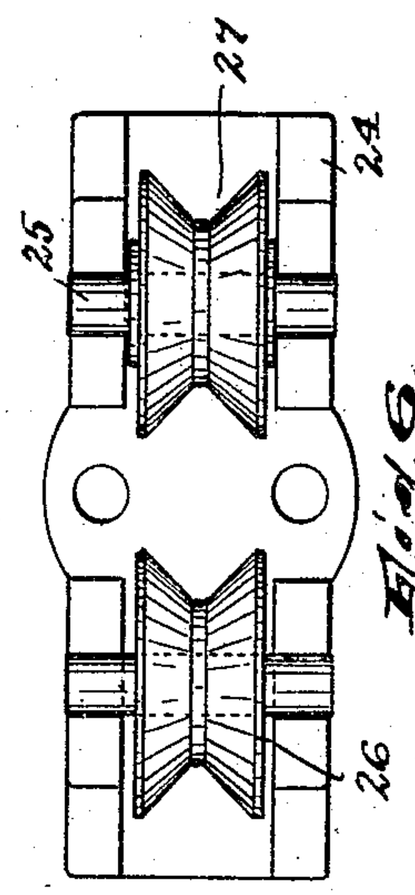

Fig. 6.

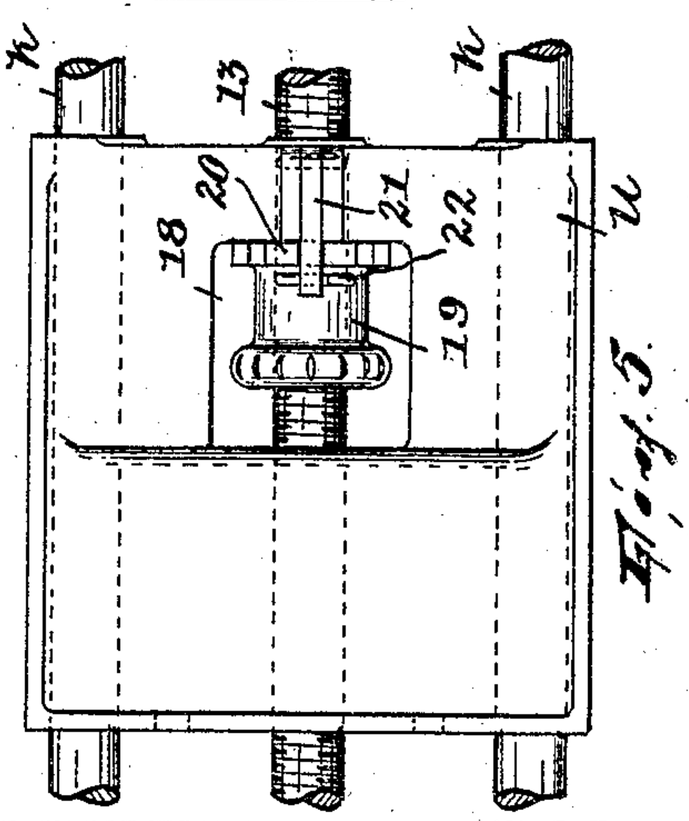

Fig. 5.

WITNESSES

Wm. D. Bell.

Elsie Kaufmann.

INVENTOR,

Grant Sipp,

BY

Edward Lenard

ATTORNEY.

940,080.

G. SIPP.

WARPING MACHINE.

APPLICATION FILED DEC. 3, 1908.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 3.

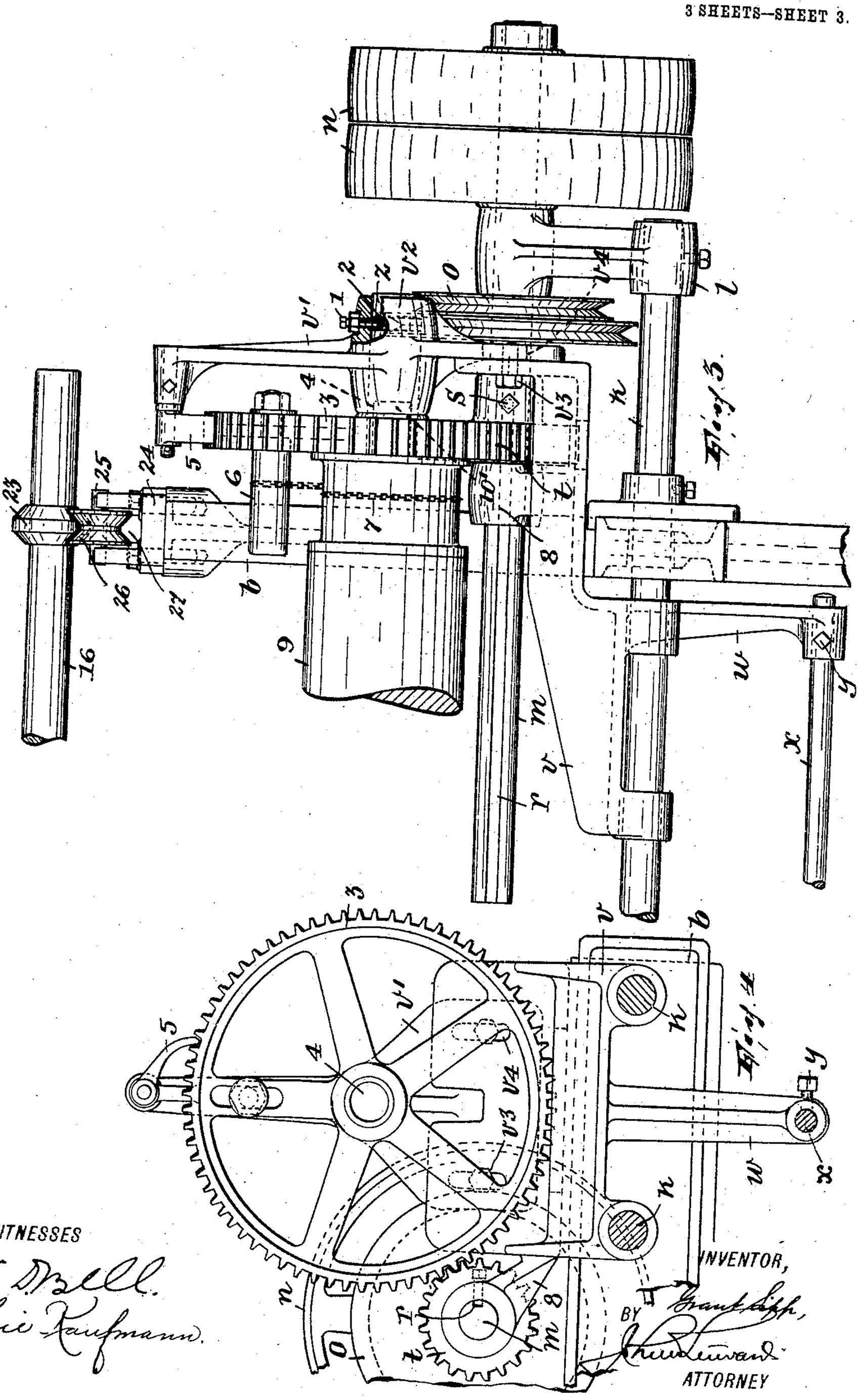

Fig. 3.

WITNESSES

Wm. D. Bell.

Clara Kaufmann.

INVENTOR,

Grant Sipp,

BY

Thurlow & Ward

ATTORNEY

UNITED STATES PATENT OFFICE.

GRANT SIPP, OF PATERSON, NEW JERSEY.

WARPING-MACHINE.

940,080. Specification of Letters Patent. **Patented Nov. 16, 1909.**

Application filed December 3, 1908. Serial No. 465,769.

To all whom it may concern:

Be it known that I, GRANT SIPP, a citizen of the United States, residing in Paterson, Passaic county, New Jersey, have invented a certain new and useful Improvement 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 characters of reference marked thereon, which form a part of this specification.

This invention relates to warping and beaming machines. In the beaming mechanism for such machines, the beam, which revolves freely in a bracket at one end, is supported at its other end in a mandrel splined into a driving gear which is journaled in another bracket; as the beam is rotated from the gear through the mandrel, the beam and mandrel, with the first bracket, move laterally so as to wind the warp sections spirally on the beam.

It is well known that in a construction of this nature the resistance or pull of the warp, the reel being at this time braked, tends to buckle the rotating body comprising the alined beam and mandrel, with the result that the gear hub or sleeve does not run true in its bearing, wearing itself and the bearing unevenly and setting up undue friction and a considerable binding effect; these undesirable results are of course the more pronounced the farther the mandrel is drawn out of the gear, as when the beaming operation is started.

One of the objects of the present invention is therefore to provide a beaming mechanism in which the pull or resistance of the warp will not be effectual to disturb the true axial position of rotating parts in their bearings and the wear will be consequently equalized and undue friction and any binding avoided.

A further object of my invention is to improve the beaming mechanism with respect to means whereby, when a partly completed warp has been temporarily transferred to the beam and is to be returned from the beam to the reel to complete it, the beam may be traversed reversely to its direction of traverse for beaming so as to return the warp in the same spiral winding it had when removed.

A still further object of the invention is to improve the bearings for the reel, so that the wear will be equalized and binding and undue friction avoided.

In the accompanying drawings, Figure 1 is a view in side elevation of so much of my improved warping and beaming machine as it is necessary to show for the purpose of illustrating the invention; Fig. 2 is a front view of the improved beaming mechanism; Fig. 3 is a similar view on a larger scale of the right-hand end-portion of the beaming mechanism, the positions of certain parts in this figure being different from what they are in Fig. 2; Fig. 4 shows what is seen in Fig. 3 when viewed from the left in said figure, the beam being removed and a certain rod and shafts appearing in section; Fig. 5 illustrates a detail of the beaming mechanism; and, Fig. 6 is an enlarged detail view of the bearings for the reel.

In this class of machine, the reel *a*, journaled in the frame *b* is, in the warping operation, driven from the beaming end of the machine through the medium of a friction wheel *c* which may be moved into contact with a circular rim *d* on the reel by means of a manually actuated lever *e*, the friction wheel being fixed on a shaft *f* journaled in a pivoted arm *g*. In the beaming operation, the friction wheel *c* being lowered out of contact with rim *d*, the reel rotates in the direction reverse to that for warping under the pull of the warp as it is being wound on the beam, the reel being at this time braked by a brake-band *h* extending around its rim *d* and drawn taut by a weighted lever *i;* the mechanism for rotating the beam is also the means from which friction wheel *c* is rotated, while the traversing of the beam is usually effected from the reel shaft through the medium of a rotating screw.

Referring, therefore, first to so much of my improvements as relate to the portion of a warping and beaming machine last above mentioned: In two plates *j* attached to the sides of the frame *b* are fixed the parallel shafts *k*, which project at the right and on their projecting ends support a triangular bearing bracket *l* in which is journaled a shaft *m* carrying fast and loose pulleys *n*, outside of the bracket, and cone pulleys *o* inside of the bracket, the pulleys *n* and *o* limiting the shaft against endwise movement. Shaft *m* is the main drive shaft of the machine and the power is transmitted to it by means of a belt (not shown) extend-

ing around the fast one of the two pulleys *n*. A crossed belt *p* extends around one of pulleys *o* and a pulley *q* fixed to friction wheel *c*. Shaft *m* projects inwardly a suitable distance past the right-hand side of frame *b* and it has a spline *r* which receives a screw *s* or other key on a pinion *t* arranged on shaft *m*.

u and *v* designate brackets arranged to slide on the shafts *k* laterally and being penetrated by them. These brackets have the depending arms *w* which are penetrated, and adapted to be connected so as to move together, by a rod *x*, set screws *y* being provided in the arms so as to fix the rod in each arm. The bracket *u* comprises a separate part *u'*, bolted thereto, and formed with an open bearing u^2, the bolts u^3 penetrating vertical slots u^4 in one of the parts *u*, *u'*, so as to allow vertical adjustment of the part *u'*. The bracket *v* likewise comprises a separate part *v'*, bolted thereto, and formed with a bearing v^2, the bolts v^3 penetrating vertical slots v^4 in one of the parts *v*, *v'*, so as to allow vertical adjustment of the part *v'*. In the bearing v^2 is journaled a short shaft *z* which is kept from endwise movement by a key 1 arranged in the bearing and entering an annular slot 2 in the shaft. This shaft carries on its inner end a gear 3 and its said inner end is formed with a socket 4. The part *v'* of bracket *v* carries a pivoted pawl 5 adapted to hold gear 3 against back action, and gear 3 carries the usual stud 6 having a chain 7 attached.

Bracket *v* is formed with an arm 8 which is penetrated by the shaft *m* and disposed with its right-hand side substantially in the plane of the left-hand side of gear 3 as seen in Figs. 2 and 3, so that when pinion *t* is slid to the left on shaft *m* arm 8 will form a stop which will limit such movement of the pinion when it is in perfect meshing alinement with gear 3.

The beam 9 has one of its trunnions 10 journaled in the open bearings *u'* and its other trunnion 10' arranged in the socket 4 of shaft *z*, and it is made to rotate with the gear 3 by the chain 7 in the usual manner. It is to be understood that, the brackets *u* and *v* being adjusted the proper distance apart to fit a given length of beam, the beam is removable from the brackets by simply raising its trunnion 10 out of the open bearing and then moving the beam lengthwise until its trunnion 10' clears the other bearing.

A brace 11 connects the shafts *k* and is secured thereto by the set screw 12. In this brace and the left side of the frame *b* is journaled a threaded shaft or screw 13 carrying a sprocket wheel 14 which is connected with a sprocket wheel 15 on the reel shaft 16 by a chain 17. The bracket *u* receives in an opening 18 thereof a nut 19 arranged on screw 13 and having the notched flange 20 whereby, when a pivoted detent 21 on the bracket *u* is engaged with the notched flange, the nut is held from rotation with the screw. The screw rotates in the direction of the arrow in Fig. 1 and, when the nut is thus interlocked against rotation, the structure comprising brackets *u*, *v*, and rod *x*, together with the beam, will traverse to the right; in order that they may traverse to the left under certain conditions, the screw then rotating in the other direction, and cotter-pin 22, passed through the end of detent 21, prevents the nut from working clear of the detent. I make no claim to the mechanism comprising the parts 19 to 22 above described.

The operation of the mechanism as so far described is as follows: In beaming, the structure comprising brackets *u*, *v* and rod *x* and carrying gear 3 and the beam stands, in its initial position, as far to the left on shafts *k* as the conditions require. The pinion *t* is now moved to the left until it abuts against arm 8, being then in mesh with gear 3. Friction wheel *c* is at this time disengaged from rim *d* and will rotate idly. Upon shaft *m* being driven pinion *t* will transmit its motion to gear 3, so that the gear will be rotated and the warp wound on the beam from the reel. Under the pull of the warp the reel will be rotated and through chain 17 screw 13 will be rotated (in the direction of the arrow in Fig. 1) so that the beam carrying structure will move gradually to the right; as it does so, its arm 8 continually advances pinion *t* to the right on shaft *m* so that said pinion is kept in mesh with gear 3. In warping, friction wheel *c* is brought into engagement with rim *d*, and pinion *t* disengaged from gear 3. Shaft *m* now being rotated the reel will be driven from shaft *m* through pulleys *o*, belt *p*, pulley *q* and friction wheel *c*. Traverse of the beam carrying structure being now unnecessary, the detent 21 is disengaged from the nut so that the latter may rotate with the screw.

Should it become necessary to wind a warp onto the reel from the beam, as when the beam has been made to receive a partly finished warp and has been laid aside while other material is being warped and beamed, the reel is driven from shaft *m* in the same manner as for warping, and, the screw 13 now rotating reversely and the nut 19 being locked to the bracket *u* by detent 21, the beam traverses with its supporting structure to the left. At this time, rod *x*, being secured in both brackets *u*, *v*, by the set screw *y*, causes said brackets to move together.

Figs. 1 and 6 show an improved bearing for the reel shaft 16. Said shaft carries

annular collars 23 having their peripheral edges double beveled to present a V-shaped cross section. In the blocks 24 on the frame *b* are journaled the trunnions 25 of alined roller bearings 26 having V-shaped peripheral grooves 27. One of these roller bearings (see Fig. 6) is allowed a slight axial movement in the block 24. The collars 23 rest in the grooves of the roller bearings 26, and owing to the shape of the collars and bearings and to the fact that one of the rollers is movable axially, the reel rotates without binding and undue friction and any wear which does occur is equalized. Moreover, since the cross-sectionally V-shaped collars 23 fit into cross-sectionally V-shaped grooves in the roller bearings 26, the reel can never become subject to lateral play, technically known as "side-shake".

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, of the beam, a supporting means for the beam movable rectilineally on the frame, a part of said means being a rotary beam-rotating and holding member, a rotary driving shaft extending parallel with the path of movement of the supporting means, and a member splined on said shaft for transmitting rotary motion from the shaft to the rotary member, said splined member being movable on the shaft rectilineally with said means, substantially as described.

2. The combination, with the frame, of the beam, a supporting means for the beam movable rectilineally on the frame, a part of said means being a rotary beam-rotating and holding member, a rotary driving shaft extending parallel with the path of movement of the supporting means, and a member splined on said shaft for transmitting rotary motion from the shaft to the rotary member, a part of said means limiting the movement of the splined member on the shaft in one direction, substantially as described.

3. The combination, with the frame, of the beam, a supporting means for the beam movable rectilineally on the frame, a part of said means being a rotary beam-rotating and holding member, a rotary driving shaft extending parallel with the path of movement of the supporting means, and a member splined on said shaft for transmitting rotary motion from the shaft to the rotary member, a part of said means limiting the movement of the splined member on the shaft in one direction and said splined member being free of said means for movement on the shaft in the other direction, substantially as described.

4. The combination, with the frame, of the beam, a supporting means for the beam movable rectilineally on the frame, a part of said means being a rotary beam rotating and holding member, a rotary driving shaft extending parallel with the path of movement of the supporting means, and a member splined on said shaft for transmitting rotary motion from the shaft to the rotary member, said means having a part thereof penetrated by the shaft and disposed at one side of the splined member and said splined member being free of said means for movement on the shaft away from said part, substantially as described.

5. The combination, with the frame, of a rectilineally movable structure arranged in said frame, the beam, a rotary beam-rotating member movable with said structure, said beam being supported in said structure and said member, means for moving said structure, and means for rotating said member, substantially as described.

6. The combination of the frame, the reel and its shaft, and a roller-bearing on the shaft, alined roller-bearings supporting the first roller-bearing and one of them being axially movable and the other fixed against axial movement, said roller-bearings being formed with entrant and receiving V-shaped portions, substantially as described.

7. The combination, with the frame, of the beam, a supporting means for the beam movable rectilineally on the frame, a beam-rotating member carried by and movable with said supporting means rectilineally of the frame, a rotary driving shaft extending parallel with the path of movement of the supporting means, and another member arranged on said shaft for transmitting rotary motion from the shaft to said first-named member, said other member being rotatable with but movable longitudinally of said shaft with the supporting means, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand this 1st day of December, 1908.

GRANT SIPP.

Witnesses:
JOHN W. STEWARD,
WM. D. BELL.