

No. 640,229.

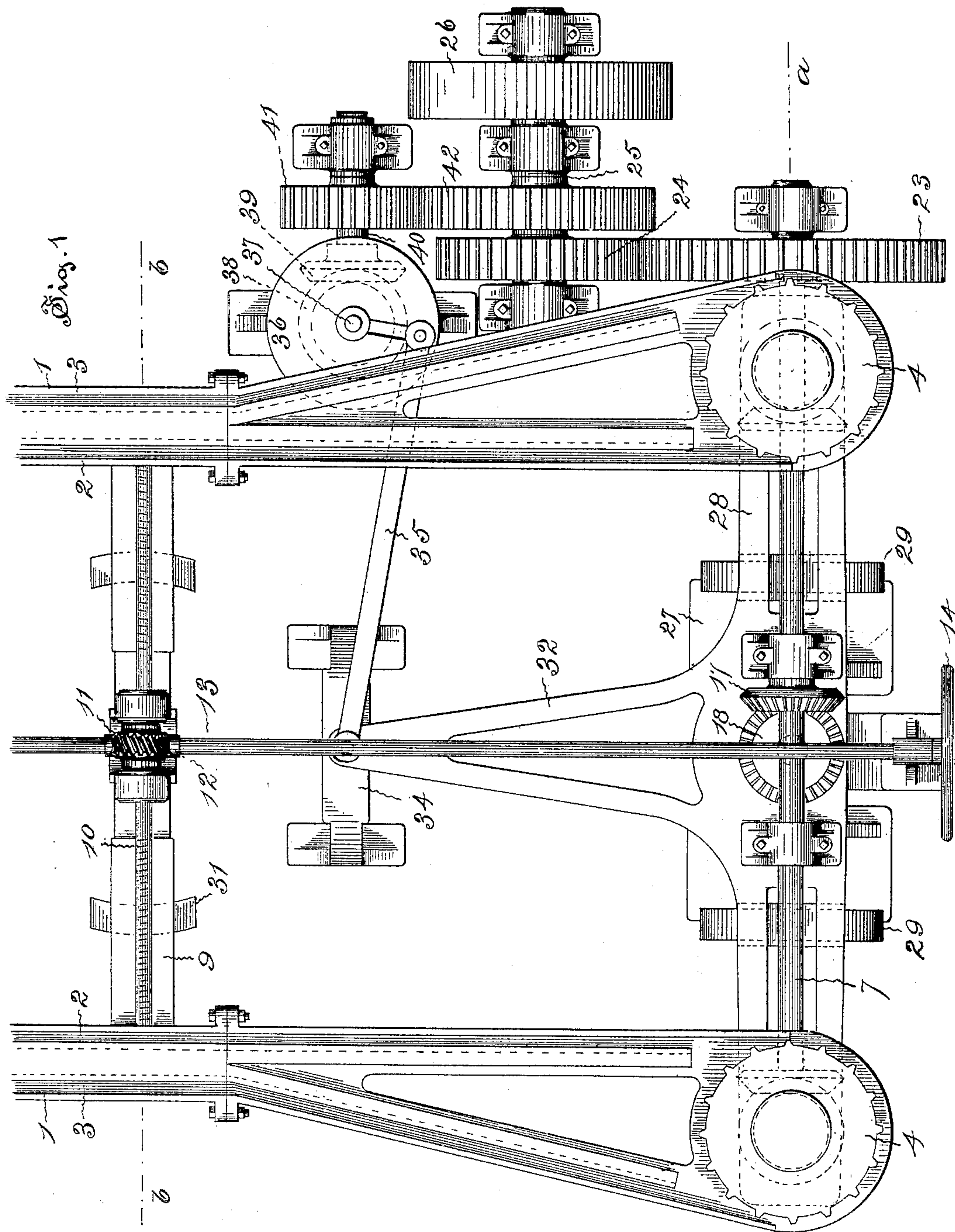
E. A. RUSDEN.  
TENTERING MACHINE.

Patented Jan. 2, 1900.

(Application filed Feb. 20, 1897.)

(No Model.)

4 Sheets—Sheet 1.



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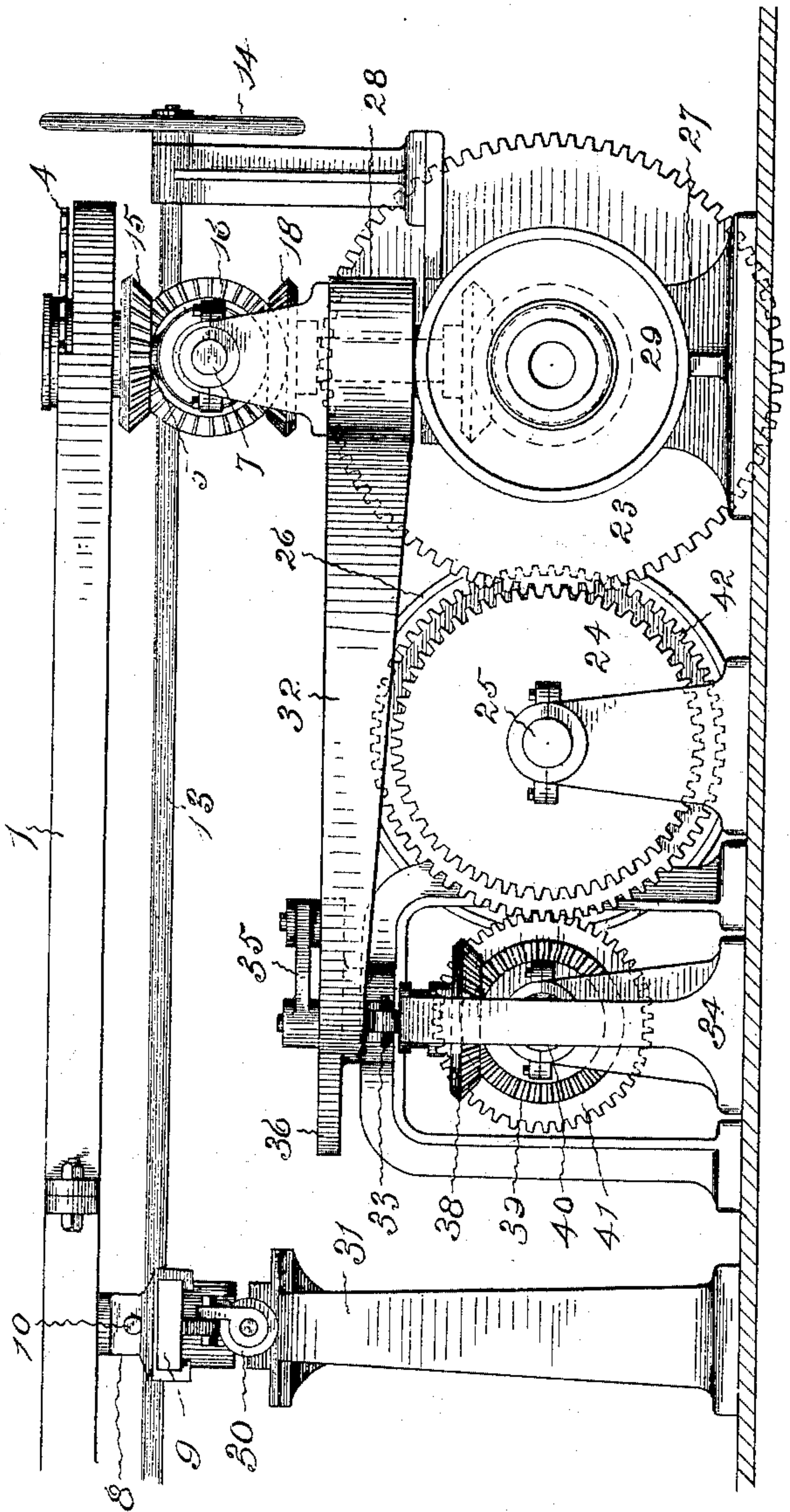
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Fig. 2



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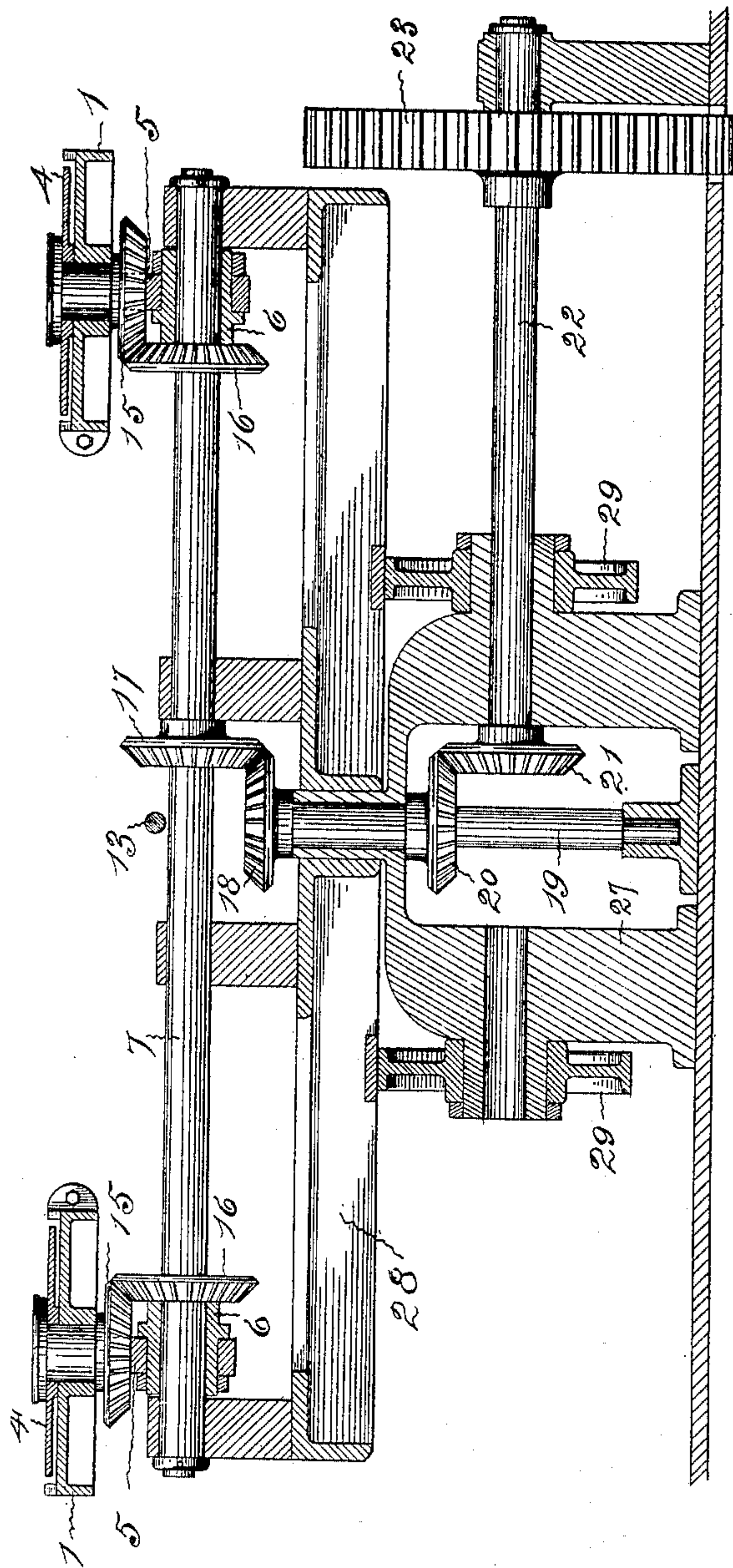
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Fig. 3



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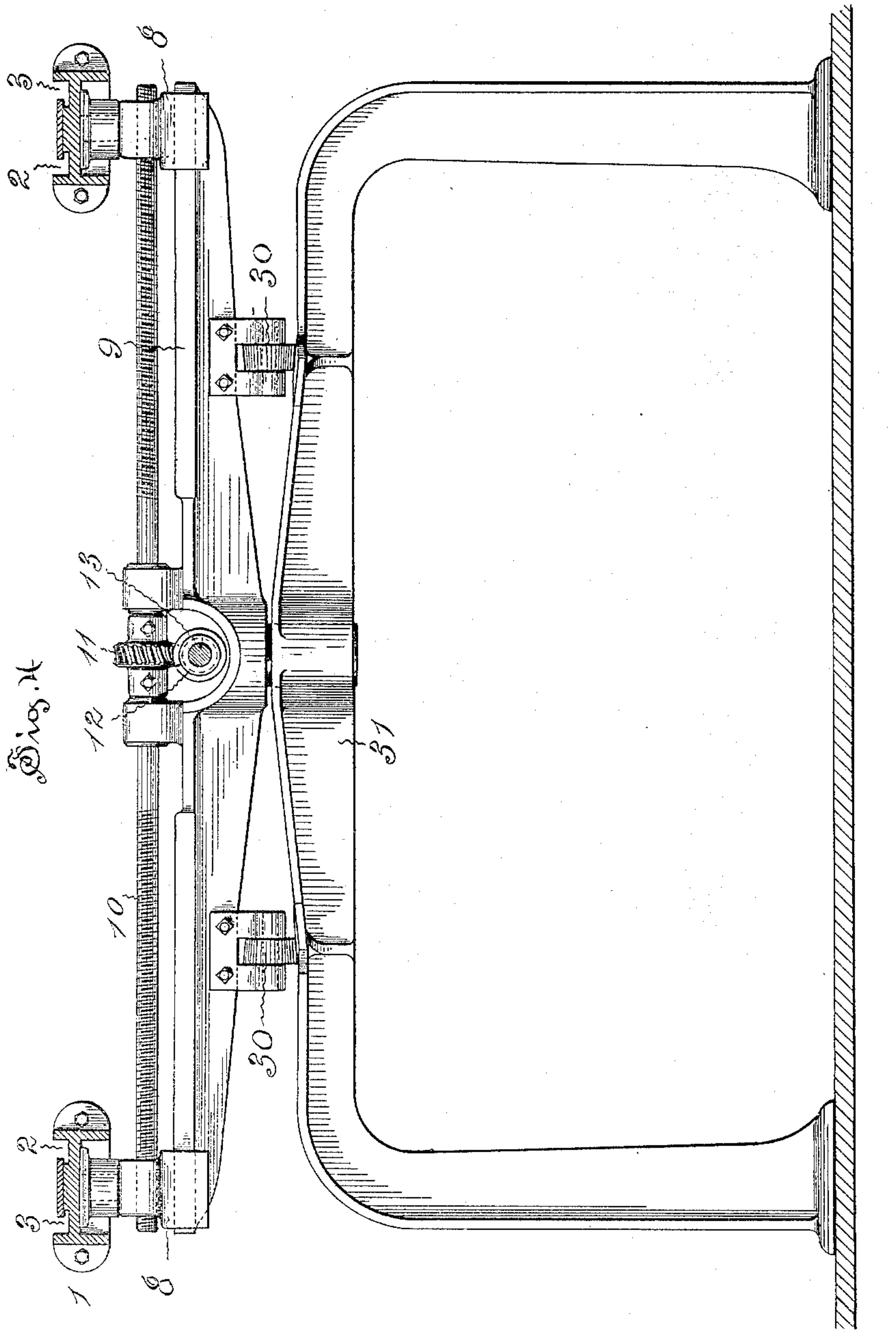
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# UNITED STATES PATENT OFFICE.

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## TENTERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 640,229, dated January 2, 1900.

Application filed February 20, 1897. Serial No. 624,366. (No model.)

*To all whom it may concern:*

Be it known that I, ETHELBERT A. RUSDEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Tentering-Machines, of which the following is a specification.

To impart to white goods after bleaching, colored goods after dyeing, and prints after printing a very soft finish, such as is demanded at the present time, the fabrics are jigged while being stretched and dried in the tentering-machines.

This invention relates to those tentering-machines in which the rails that bear the clip-chains are reciprocated to give the cloth that is being stretched and dried a jigging motion while being advanced.

The rapidity and extent of the jigging is an essential element in determining the quality of the finish. With the prior machines for this purpose the necessary rapidity and extent of jigging are obtained only at a sacrifice of the rate of feed of the cloth, and this consequently decreases their capacity.

The object of the present invention is to provide a machine of this nature with strong, durable, and easily-movable mechanisms arranged in a manner that will allow a quick feed of the clip-chains, thus insuring a fast advance of the cloth and at the same time permit a very rapid and extended reciprocation of the chain-rails, so as to produce a jigging motion that will impart the very soft and desirable finish required for the fabrics, thus increasing the efficiency of the machines without decreasing their capacity.

In the embodiment of the invention shown in the drawings the chain-rails are adjustably borne upon cross-bars that are retained in their positions and guided in their movements above the supporting-frames by central pivots or similar axial connections and that are supported by rolls located at some distance from each other, so that the weight of the movable parts does not come upon the pivots or upon sliding parts, but is distributed over a wide base and is sustained by rolling parts, and the cross-head, which is similarly supported, is provided with a centrally-projecting tongue that is oscillated by a crank

mechanism, so that all strains incident to the movement of the parts are equally distributed throughout the head and are balanced in such manner that there will be no rocking of the head, bars, or rails, or undue pressure and friction brought upon any of the pivots, as more particularly hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan of the driving end of a tenter that embodies the invention. Fig. 2 is a side elevation of this end of the machine. Fig. 3 is a vertical transverse section on plane indicated by the broken line *a a* of Fig. 1; and Fig. 4 is a similar section, on larger scale, taken on plane indicated by the broken line *b b* of Fig. 1.

There are no chains shown in the views, for the ordinary clips can be hinged together and used with this machine. The rails 1, upon which the clip-chains travel, may be of any practical length, those of the machine from which the views were taken being about ninety feet. These chain-rails are made up of sections bolted together, and the clip-chains move along their upper surfaces in one direction through the grooves 2 and in the opposite direction through the grooves 3. The end sections of the chain-rails are widened out, so that the chains may be passed around the chain-driving sprocket-wheels 4.

At the driving end of the machine the end sections of the chain-rails are supported upon studs projecting from blocks 5, that are borne by sleeves 6, movably mounted upon the shaft 7, Fig. 3. The other sections of the chain-rails are supported upon studs projecting from blocks 8, movably mounted upon ways formed on the cross-bars 9, Fig. 4. The blocks 8 have threaded perforations, through which pass threaded rods 10, that between centrally-located bearings support worm-gears 11, which mesh with worms 12, mounted upon a shaft 13, that extends longitudinally of the machine and bears a hand-wheel 14 at one end, Fig. 1. By rotating this hand-wheel the chain-rails are moved toward or from each other to adjust the machine for cloth of different widths. Of course the shaft 13 can be driven by power instead of by hand, if desired.

Upon the studs projecting from the blocks 5 at the ends of the chain-rails are mounted bevel-gears 15. These gears are connected



with the chain-driving sprocket-wheels 4 and are in mesh with bevel-gear 16, connected with the sleeves 6, that are keyed upon the shaft 7. When the chain-rails are moved toward or from each other, the sleeves move along the shaft and the gears move with them, so that they are always in mesh, and when the shaft is rotated the gears turn the driving-sprockets and feed the clip-chains. Mounted upon the shaft 7, near the middle, is a bevel-gear 17, that meshes with a bevel-gear 18 on a shaft 19, which bears a bevel-gear 20, that meshes with a bevel-gear 21, the last gear being on a shaft 22, provided with a spur-gear 23, in mesh with which is a spur-gear 24 on the main shaft 25, that bears the driving-pulley 26. The vertical shaft 19 is supported by bearings formed in the head-frame 27 centrally of the end of the machine, and the shaft 22 is supported at one end by bearings in this frame and at the opposite end by bearings formed in an ordinary standard, Fig. 3.

The shaft 7 is supported by bearings at the ends and also near the middle each side of the bevel-gear 17. These bearings are carried by a movable cross-head 28, that is supported by rolls 29, mounted some distance each side of the middle of the head upon hubs that project from the frame 27. The cross-head 28 is retained in position and guided in its movement upon the rolls by a hollow pivot or similar axial connection that projects upwardly from the frame, and the shaft 19 passes through this hollow pivot, Fig. 3.

The cross-bars 9, that hold the chain-rails, are mounted upon rolls 30, located some distance from each other, both sides of the middle of the bars, and these rolls run upon table-surfaces formed on the arched cross-frames 31. The cross-bars are retained in position and are guided in their movements by pivots or similar axial connections that extend between them and the arched cross-frames, Fig. 4.

Projecting longitudinally of the machine from near the middle of the cross-head is a tongue 32. The outer end of this tongue is preferably supported by a roll 33, adapted to run on a table-surface formed on the standard 34, and this end of the tongue is connected by a link 35 with a crank-disk 36. The link is usually adjustably connected with the disk, which is mounted upon a vertical shaft 37, that bears a bevel-gear 38, that is in mesh with a bevel-gear 39 on a horizontal shaft 40, that is provided with a spur-gear 41, in mesh with which is a spur-gear 42 on the main driving-shaft 25, Fig. 1. The movement of these gears rotates the crank-disk, and the reciprocation of the connected link oscillates the tongue and attached cross-head. The oscillation of the cross-head causes the connected rails, with the chains, to be reciprocated alternately; but this does not interfere with the operation of the mechanisms described for feeding the chains. This alternate reciprocation

of the rails with the chains jigs any cloth held by the clips of the chains and being advanced through the machine by the feed of the chains.

The oscillatory movement of the cross-head is obtained by means of the crank mechanism through the medium of the tongue that extends from near the axis of oscillation of the head at right angles therewith, and this arrangement affords a firm and strong construction and insures a regular and even movement for the head without straining any of the parts.

The cross-head is supported at some distance on each side of the axis of oscillation, so that its weight and the strains of its movement are distributed on a wide base instead of coming on its small pivot. This permits the use of rolling-supports and facilitates a quick movement of the parts without much friction, for there is little strain on the pivot that is only required to retain the cross-head in place as it moves on its wide rolling-base.

With the cross-bars mounted upon rolls that run upon the wide strong arched cross-frames all rocking and swaying are obviated, and in this case all of the weight of these parts is removed from the pivots and is borne on the wide base formed by the easily-running rolls. These pivots only have to retain the cross-bars in position, so that they will ride properly on the rolls when oscillated.

The wide-spread arched cross-frames not only enable the rolls that support the cross-bars to be located some distance from the axis of rotation, so as to provide a wide base, but also leave a large unobstructed space directly beneath the machine for the location of the many steam or air pipes necessary for drying the cloth as it is being stretched and jigged.

The chain-rails can be readily adjusted for any ordinary widths of cloth without stopping the machine. The feed of the chains is regular and true, for the feeding mechanisms are mounted very firmly, and the shaft that bears the chain-rails and part of the feed-gears is supported by a number of bearings, and it is not subjected to any strains that will tend to spring it or cause the bearings to bind.

The parts of this machine may be made relatively light in weight, for they are supported in a manner that obviates all tipping and rocking, and this facilitates a rapid and extended jigging movement. The supporting of the cross-head and cross-bars that bear the chain-rails upon rolls located some distance from the axes of their oscillations insures an easy and free motion, with a consequent steady reciprocation of the long chain-rails, and this also aids a rapid and extended jigging. The firmness of the structure and the ease and steadiness of the movements permit the use of light parts, and this so reduces the inertia of the parts of the machine when in operation that a rapid and extended jigging is possible. This construction also effects a saving in the power required



to operate the machine, as well as increasing the capacity and efficiency by allowing a fast feed of the cloth together with a very rapid and extended jiggling.

5 I claim as my invention—

1. In a tentering-machine, in combination, a frame, rolls supported by the frame, a cross-head supported by the rolls, a guiding-pivot loosely connecting the frame and the cross-  
10 head, mechanisms for oscillating the cross-head, cross-bar frames, cross-bars supported by the cross-bar frames, rails connecting the cross-head and cross-bars, endless clip-chains movable along the rails, and mechanisms for  
15 advancing the chains, substantially as specified.

2. In a tentering-machine, in combination, a frame, hubs projecting transversely of the machine from the frame, rolls mounted upon  
20 the hubs, a hub projecting upwardly from the frame, a cross-head supported by the rolls and having an opening for receiving the upwardly-projecting hub, and mechanisms for oscillating the cross-head, substantially as  
25 specified.

3. In a tentering-machine, in combination, a frame, hubs projecting transversely of the machine from the frame, rolls mounted upon  
30 the hubs, a hub projecting upwardly from the frame, a cross-head supported by the rolls and having an opening for receiving the upwardly-projecting hub, mechanisms for oscillating the cross-head, cross-bar frames, cross-bars pivotally retained above the cross-bar  
35 frames, rails adapted to carry endless clip-chains loosely supported by the cross-head and cross-bars, means for adjusting the rails transversely of the machine, and mechanisms adjustable with the rails for advancing the  
40 chains, substantially as specified.

4. In a tentering-machine, in combination, a frame, hubs projecting transversely of the machine from the frame, rolls mounted upon  
45 the hubs, a hub projecting upwardly from the frame, a cross-head supported by the rolls and having an opening for receiving the upwardly-projecting hub, mechanisms for oscillating the cross-head, cross-bar frames and cross-bars, rolls interposed between the cross-  
50 bar frames and the cross-bars, rails adapted to carry endless clip-chains loosely supported by the cross-head and cross-bars, means for adjusting the rails transversely of the ma-

chine, and mechanisms adjustable with the rails for advancing the chains, substantially 55 as specified.

5. In a tentering-machine, in combination, a frame, a cross-head, rolls located between the frame and cross-head and supporting the weight of the cross-head, mechanisms for oscil- 60 lating the cross-head, a shaft supported by bearings fixed to the cross-head, cross-bar frames, cross-bars, rolls located between the cross-bar frames and cross-bars and supporting the weight of the cross-bar frames, rails 65 adapted to carry endless clip-chains movably connected with the cross-bars and the shaft supported by the head, and mechanisms for rotating the shaft, substantially as specified.

6. In a tentering-machine, in combination, 70 rolls supported by the frame, a cross-head supported by the rolls, a guiding-pivot loosely connecting the frames and the cross-head, mechanism for oscillating the cross-head, bearings fixed to the cross-head, a shaft sup- 75 ported by the bearings, chain-rails with their ends adjustably supported by the shaft, wheels mounted upon the rails for advancing the chains, intermeshing gears between the shaft and the chain-wheels, and intermeshing 80 gears between the shaft and the driving mechanism, substantially as specified.

7. In a tentering-machine, in combination, a frame, rolls mounted upon hollow bearings projecting outwardly from the frame, a hollow 85 pivot projecting upwardly from the frame, a cross-head supported by the rolls and loosely retained by the hollow pivot, bearings fixed by the cross-head, a shaft supported by these bearings, rails with their ends supported by 90 the shaft, chain-wheels mounted upon the rails, intermeshing gears between the shaft and chain-wheels, a shaft extending through the hollow pivot of the frame, intermeshing gears between the vertical shaft and the shaft 95 on the cross-head, a horizontal shaft supported at one end by the frame, intermeshing gears between the horizontal shaft and the vertical shaft, and intermeshing gears between the horizontal shaft and the driving 100 mechanism, substantially as specified.

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