

R. L. FLOYD.
MECHANISM FOR ELEVATING INVALIDS.
APPLICATION FILED JULY 24, 1908.

936,107.

Patented Oct. 5, 1909.

2 SHEETS—SHEET 1.

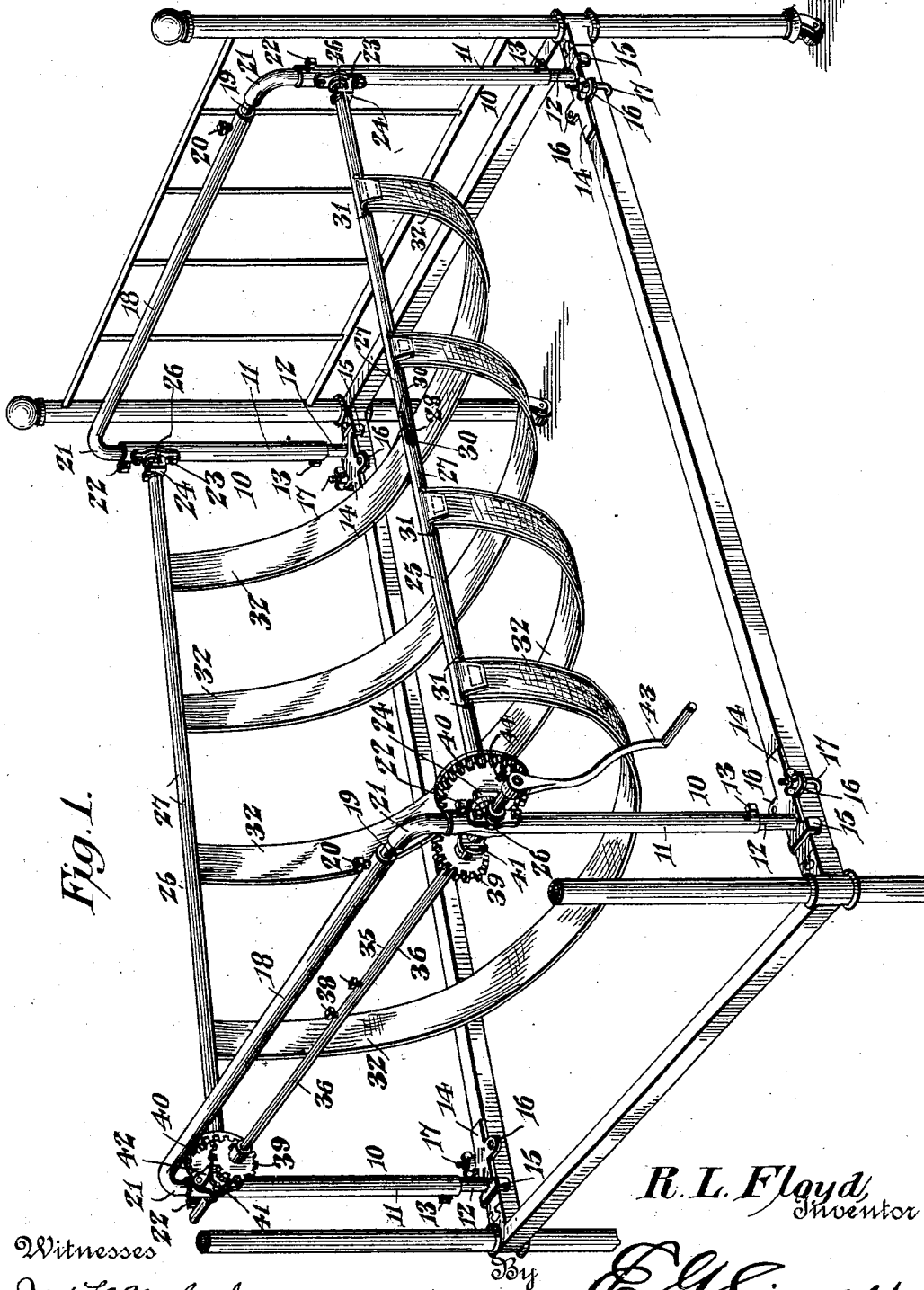


Fig. 1.

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Witnesses

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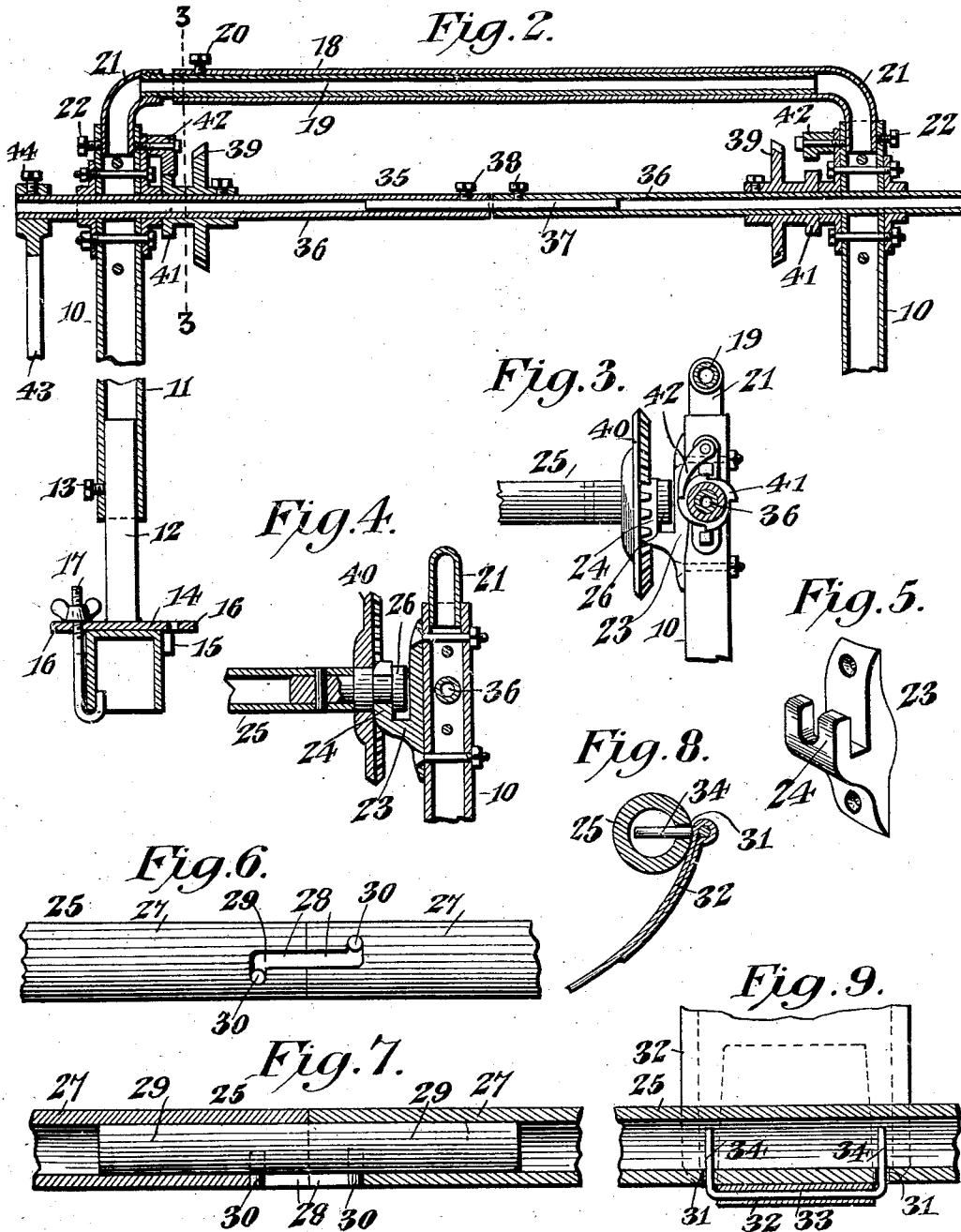
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Witnesses

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UNITED STATES PATENT OFFICE.

ROBERT L. FLOYD, OF STAUNTON, VIRGINIA.

MECHANISM FOR ELEVATING INVALIDS.

936,107.

Specification of Letters Patent.

Patented Oct. 5, 1909.

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To all whom it may concern:

Be it known that I, ROBERT L. FLOYD, a citizen of the United States, residing at Staunton, in the county of Augusta and State of Virginia, have invented a new and useful Mechanism for Elevating Invalids, of which the following is a specification.

The present invention relates to means for elevating patients from their beds, and particularly to that class of these devices in which a webbing is used beneath the patient which is attached to hoisting means and equally raised on both sides by one actuation.

Heretofore this class of devices have been more or less expensive and cumbersome and have not been attachable to ordinary beds, but instead have either required a specially constructed bed or have had to be of such size as to be erected separately and then placed around or over a bedstead and independent of the same. Such structures are cumbersome, not easily handled, must be kept with the parts assembled or require the services of a skilled workman to put it in place and to take down, and interfere with the comfort of the patient and the proper attention of the nurse.

The objects of my invention are to provide a structure of this character which will be very simple and easily and quickly put together or disassembled without the necessity of skilled labor; which shall be capable of being knocked down and compactly arranged for easy stowage or transportation; which can be readily attached to any ordinary bed within the limits thereof and as easily removed, and in which the elevating devices may, if required, be removed entirely from the supporting frame, thus leaving only the framework of the apparatus standing at the head and foot of the bed and avoiding any interference with the ordinary treatment of the patient.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a perspective view of the mechanism, showing the same applied to a bedstead. Fig. 2 is a vertical sectional view through one end of the mechanism. Fig. 3 is a detail sectional view on the line 3—3 of Fig. 2. Fig. 4 is a longitudinal view through the structure illustrated in Fig. 3. Fig. 5 is a detail perspective view of one of the bearing brackets. Fig. 6 is a view in elevation of the joint between the sections of one

of the rollers. Fig. 7 is a longitudinal sectional view therethrough. Fig. 8 is a cross sectional view through one of the rollers, showing the means for attaching a supporting strap thereto. Fig. 9 is a longitudinal sectional view through the same.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, sets of corresponding standards 10 are employed, each standard consisting of slidably telescoped sections 11 and 12, said sections being held against movement and in adjusted position by suitable set screws 13. The lower end of the lower section 12 of each standard has a base plate 14 fastened thereto, said base plate being provided with suitable depending lugs 15 arranged to engage alongside the rail of a bedstead, when said base plate is located on the rail. Each base plate has oppositely extending ears 16 through either of which can be passed a clamping bolt 17 for securing the base plate to the rail.

The corresponding standards of the different sets are connected by cross pieces comprising slidably telescoped sections 18 and 19 normally held against their relative sliding movements by set screws 20. These sections have downturned terminals 21 that are engaged in the upper ends of the tubular standard sections 11 and are fastened therein by set screws 22. The standards of each set have secured to their upper portions brackets 23, provided with upstanding bifurcated hooks 24, and rollers 25 journaled in the hooks 24, have heads 26 that are rotatably mounted in the brackets. These bifurcated hooks while forming strong bearings for the rollers or shafts 25 yet permit the rollers to be quickly removed or set in place, thus not only providing for a disassembling of these parts, but permit the rollers and the cross webs or bands 32 to be removed temporarily when circumstances render this necessary. The peculiar form of these brackets, too, obviates the necessity of any skilled labor in placing the shafts in engagement with the brackets. The brackets form sockets for the shafts and the shafts may be easily lowered into position in the sockets by anyone, whereupon the shafts will be in engagement with the gears 39. Each of these rollers consists of tubular sections 27 having their ends abutted and provided with aligned oppositely disposed bayonet slots 28.

A core section 29, located in the ends of the abutted sections, is provided with outstanding pins 30 that are engaged in the bayonet slots, said core with its pins, thus
 5 serving to hold the sections against relative rotation in one direction, and preventing the separation of the sections, while the rollers constitute the connection between the opposite ends of the frame. These rollers
 10 are provided at suitable intervals with sets of sockets 31, and supporting straps or webs 32, of canvas or other suitable flexible material, have secured to their ends, staples 33 provided with offset terminal pins 34 that
 15 detachably engage in the sockets.

A transversely disposed driving shaft 35 is located at one end of the frame, and consists of tubular sections 36 journaled respectively in the opposite standards. These sections are connected by a core rod 37 secured
 20 to said sections by set screws 38. With this construction, it will be evident that the shaft can be extended accordingly as the frame is widened. The shaft 35 is provided with
 25 gear wheels 39 meshing with gear wheels 40 secured to the adjacent ends of the rollers, and located between the gear wheels 39 and the adjacent posts 10 are ratchet wheels 41, said ratchet wheels being oppositely dis-
 30 posed as will be evident by reference to Fig. 1. Dogs 42, pivoted on the standards adjacent to the ratchet wheels, cooperate with the same, said dogs being so arranged that they can be reversed in order that they will
 35 be inactive. The shaft 35 has its ends projecting beyond the standards, and a handle crank 43 is arranged to be placed upon either of the projecting ends and secured thereto by a set screw 44.

The manner of using the device is substantially as follows. The cross bars 18—19 are extended to the width of the bed, and the standards are then mounted upon the side rails, the shaft 36 being also properly
 45 extended. The rollers 25 are then engaged in the journal brackets, and the handle crank 43 applied to the end of the shaft 35, which is most convenient, the adjacent dog, being thrown into cooperation with its ratchet
 50 wheel, while the opposite dog is reversed in order that it will be inactive. The straps 32 are then separately passed beneath the patient, and it will be evident that this can be easily accomplished without causing dis-
 55 comfort. Any number of straps may be employed as desired, said straps being comparatively broad. The staples are then engaged with the rollers and consequently upon rotating the handle crank, it will be
 60 evident that both rollers will be simultaneously operated, causing the end portions of the straps to be wound thereupon, and elevating the patient. The bed clothing can consequently be changed without difficulty.
 65 Experience has demonstrated that the straps

constitute a perfectly comfortable support. The structure is readily applicable to metal or wooden beds, the only difference being that for wooden beds, longer clamping bolts
 17 will be necessary. As will be evident, it
 70 can be adjusted to beds of different sizes, and the rollers can be raised or lowered by lengthening or shortening the standards 10. In practice, the frame and rollers are constructed of light but strong tubular material,
 75 and as the parts can be readily disconnected, the structure can be compactly folded into a small compass, and being light in weight, can be readily carried. It will thus be clear that the elevating means is not only useful
 80 in hospitals and institutions of that character, but can be employed as part of a trained nurse's equipment, inasmuch as it can be used upon ordinary beds.

The peculiar advantages of my invention
 85 lie in the fact that it is capable of being applied to an ordinary bedstead and attached thereto, the bed forming the base of the structure. The side rails of beds and particularly metal beds are practically all
 90 of the same width and thickness and are practically all formed with a flat upper surface. Hence it is to the side rails that devices of this character should be attached,
 95 this attachment providing for the firm bearing upon the flat side of the said rails as well as a clamping action which prevents any lateral movement of the supports or standards out of the vertical. The base
 100 clamp 14 which I have devised permits of a perfectly rigid attachment being made between the corner standards or uprights and the side rails. The base rests firmly upon the flat upper surface of the rails and the clamps engage beneath the rails, these
 105 clamps being so arranged as to be easily turned up and tightened. It will be seen that the structure therefore when in place takes up no more room than the bed itself, and that it does not encroach upon the floor
 110 space in any manner, this being of great importance in hospitals where the utmost economy of space must be had.

My apparatus being made in sections may
 115 be easily attached in place by a nurse, or any mechanically unskilled person. The base 14 and uprights 11, 12, are first put up and then joined by the cross braces 18, 19, which are, of course, adjusted to fit the bed. These standards and cross bars offer no ob-
 120 struction to the patient or to the nurse. Only when it is desired to raise the patient need the rollers 25 be put in place and the bands or webs attached. These bands 32 may be
 125 left beneath the patient if desired, but detached from the rollers and only attached when it is desired to lift the patient. It is a most important feature that the patient be lifted equally at all points, that the straps
 130 or bands shall be equally raised upon both

rollers, and that there should not be two separate devices for lifting the patient, and hence, any liability of lifting him unequally, which would tend to throw the body of the patient out of proper position. This is of particular importance in surgical cases.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. The combination with a bedstead, of a removable invalid-elevating apparatus carried wholly thereby and movable with the same, said mechanism comprising head and foot frames forming the sole means of connection with the bedstead, and each comprising extensible standards and extensible connecting pieces detachably connected with the standards, and means carried by and detachably connected with the said frames for raising or lowering the patient with respect to the bedstead.

2. The combination with a bedstead, of a removable invalid-elevating apparatus carried wholly thereby and movable with the same, said mechanism comprising head and foot frames forming the sole means of connection with the bedstead, and each comprising extensible standards and extensible connecting pieces detachably connected with the standards, fixed bearings on the standards adapted to be raised or lowered by extending or contracting the standards, rollers extending between the frames and removably supported in the said bearings and raised or lowered with the latter, a webbing secured to the rollers and adapted to wind thereon, and means for simultaneously turning the rollers.

3. In mechanism of the character set forth, a supporting frame having standards provided at their lower ends each with a base plate adapted to rest upon the flat upper face of the side rail of a bedstead, each of said bases being formed with spaced depending lugs engaging with the opposite sides of said side rail and said base also having a hooked clamping bolt engaging beneath the said rail, longitudinally extending rollers removably carried by the standards, and flexible supporting bands attached to the rollers.

4. In mechanism of the character set forth, a supporting frame having standards provided at their lower ends with clamps, means for clamping the same to a bedstead,

longitudinally-extensible transverse cross pieces engaging with the upper ends of the standards, means for clamping the cross pieces at any point of extension desired, and opposed longitudinally-extending rollers detachable from but rotatably mounted on said standards, flexible supporting bands attached to the rollers, and mechanism on the standards for simultaneously rotating both rollers to wind up the said bands thereon.

5. In mechanism of the character set forth, a supporting frame having vertically-extensible standards provided at their lower ends with means for clamping the same to opposite ends of the side rail of a bed and supported wholly on the said rails, transverse cross bars detachably connecting two of the standards across the bed, detachable longitudinally disposed opposed rollers removably journaled in the standards and connecting the upper ends of standards on the same side to brace the same, webbing connecting said rollers, gear wheels on said rollers and removable therewith, a transverse shaft mounted transversely across the supporting frame at one end thereof and in the same plane with the said rollers, gear wheels thereon engaging with the gear wheels on the rollers, and a crank whereby the shaft may be turned to actuate said rollers.

6. In mechanism of the character set forth, a supporting frame having longitudinally-separated and extensible standards provided at their lower ends with means for clamping the same to the ends of the side rail of a bedstead, slotted journals formed upon the said standards, longitudinally-disposed rollers having enlarged heads adapted to engage behind said slotted journals and connecting the upper ends of the standards to brace the same, said rollers being supported wholly on the standards by the journals and raised or lowered by the lengthening or shortening of the standards flexible bands connected to the rollers to be wound thereon, and mechanism mounted on the standards whereby both rollers may be given a simultaneous movement of rotation.

7. In mechanism of the character set forth, a supporting frame comprising corner standards, each having a base adapted to be attached to the upper face of a side rail of a bed, tubular telescopic sections mounted upon said standards and forming part thereof, transverse tubular cross pieces connecting the upper ends of each two of the standards and slidably engaging therewith for a transverse extension, socketed brackets projecting from the tubular sections of the standards, said sockets having a slot open at one end, opposed longitudinal rollers each having a head at each end adapted to be inserted within the slot of said sockets for rotation therein, a transverse shaft detachably

mounted between two of said standards, gears mounted on the rollers and on the transverse shaft intermeshing with each other, a crank on said transverse shaft, and webbing detachable from the rollers and connecting the same and adapted to pass beneath the body of a patient.

8. In a mechanism of the class described, the combination of a supporting frame, a pair of rollers carried thereby and provided with transversely-extending spaced sockets, a plurality of bands extending from one roller to the other, and pins hingedly connected to both ends of the bands and removably engaged in the sockets for attaching the ends of the bands to the rollers, said ends being adapted to wind on the rollers and thereby firmly hold the pins in place.

9. In elevating mechanism of the character set forth, the combination with sets of corresponding standards, each comprising slidably telescoped sections, means for securing the sections against movement, clamping devices carried by the lower ends of the standards for securing the same to the rails of a bed, brackets carried by the upper sections of the standards, rollers detachably journaled in the brackets and constituting connections between the standards of each set, supporting straps extending between and having their ends detachably connected to the rollers, extensible connections between the corresponding standards of the different sets, said connections comprising slidably telescoped sections, and means for holding said sections against relative movement, an extensible shaft journaled on certain of the standards of the different sets and comprising slidably telescoped sections, means for rotating the shaft, and gear connections between the shaft and the rollers.

10. In elevating mechanism of the character set forth, the combination with sets of corresponding standards, each comprising slidably telescoped sections, means for securing the sections against movement, clamping devices carried by the lower ends of the standards for securing the same to the rails of a bed, brackets carried by the upper sections of the standards, rollers detachably journaled in the brackets and constituting connections between the standards of each set, supporting straps extending between and having their ends detachably connected to the rollers, extensible connections between the corresponding standards of the different sets, said connections comprising slidably telescoped sections, and means for holding said sections against relative movement, an extensible shaft journaled on certain of the standards of the different sets and comprising slidably telescoped sections, means for rotating the shaft, and gear connections between the shaft and the rollers, said rollers comprising tubular abutting sections having

bayonet slots in their abutting ends, and a core section located in the abutting ends and having pins that engage in the bayonet slots.

11. In mechanism of the character set forth, two sets of pairs of standards, cross pieces connecting the tops of each pair of standards and forming with the latter opposed end frames, the cross pieces having depending extremities telescopically received on the upper ends of the standards, clamps provided at the lower ends of the standards for attachment to a suitable support, brackets having upstanding bifurcated hooks and secured to each one of the standards near the upper ends thereof, longitudinally-disposed rollers journaled in the hooks and having heads at their ends which engage behind the hooks and held therein by the combined weight of the rollers and parts carried thereby, transversely arranged bands connected at their ends to the rollers, and gearing for driving the latter.

12. In mechanism of the character set forth, the combination with vertical standards having connecting cross pieces, brackets applied to the standards at their upper ends, clamps carried by the standards at their lower ends, said brackets having upstanding bifurcated hooks, rollers journaled in the hooks and having heads engaged behind the latter and rotatably mounted in the brackets, a gear wheel mounted on one end of each roller in advance of said head, a drive shaft connecting one pair of the standards and carrying gear wheels meshing with the gear wheels on the rollers, and transversely arranged bands connected at their ends to said rollers.

13. The combination with the end frames, each comprising vertical standards with connecting cross pieces, a transverse shaft connecting the standards of one of the end frames and having gear wheels mounted thereon in a relatively fixed position, brackets carried by each of the standards near the upper ends thereof, said brackets having upstanding bifurcated hooks which are offset from the brackets, longitudinally arranged rollers journaled in the hooks, means provided on the ends of the rollers to engage with the hooks of the brackets, a gear wheel mounted on each of the rollers in advance of one end thereof, said gear wheels being adapted to mesh with the gear wheels on the said transverse shaft, and transverse bands connecting the rollers between the end frames.

14. In mechanism of the character set forth, end frames, each comprising two vertical standards connected by a cross piece at their upper ends, means carried by the lower ends of the standards for fastening the same to a suitable support, a transverse shaft connecting the standards of one of the end frames below its cross piece, gear wheels

carried by the said shaft near the ends,
brackets applied to the standards of the end
frames near the upper ends thereof, rollers
carrying at one of their ends gear wheels
5 which are adapted to mesh with the gear
wheels on the said transverse shaft, trans-
verse bands connecting the rollers, the ends
of said rollers being journaled in said brack-
ets whereby the rollers may be removed from
10 the brackets, carrying with them the gear

wheels and bands, without disturbing the
end frames or removing any bolts.

In testimony, that I claim the foregoing
as my own, I have hereto affixed my signa-
ture in the presence of two witnesses.

ROBERT L. FLOYD.

Witnesses:

WM. A. PRATT,

M. B. MCFARLAND.