

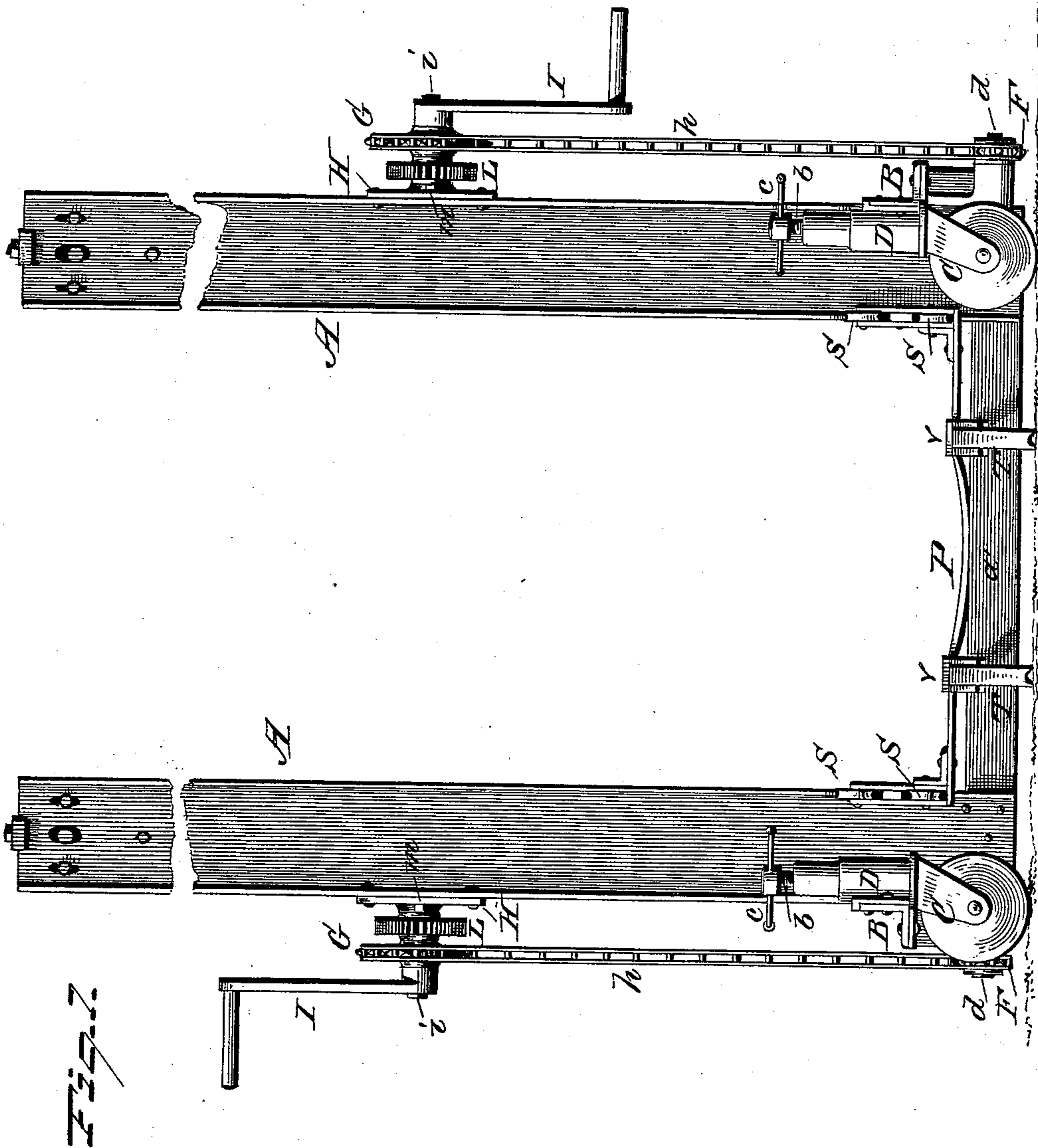
(No Model.)

3 Sheets—Sheet 1.

J. H. RICHARDS.  
ELEVATOR.

No. 541,683.

Patented June 25, 1895.



Witnesses  
C. Williamson  
E. George Lind.

Inventor  
J. H. Richards.  
per  
Chas. H. Fowler  
Attorney.

(No Model.)

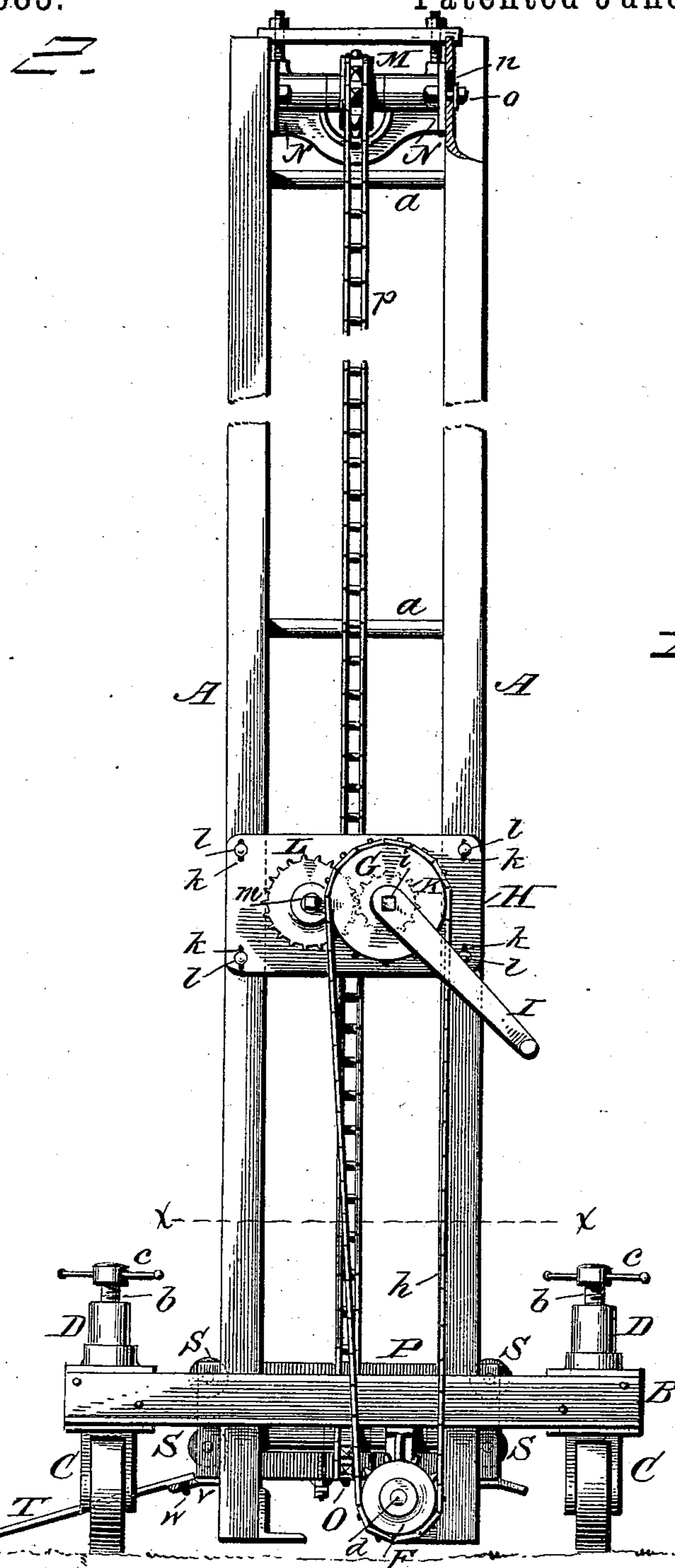
3 Sheets—Sheet 2.

J. H. RICHARDS.  
ELEVATOR.

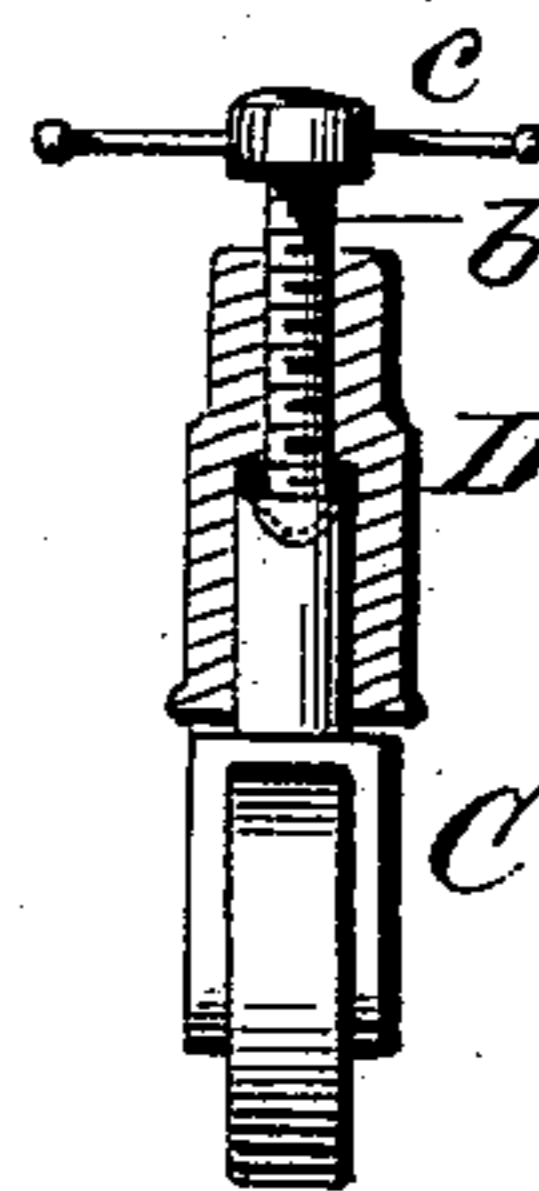
No. 541,683.

Patented June 25, 1895.

*Fig. 2.*



*Fig. 7.*



Witnesses  
G. Williamson.  
A. George Lind.

Inventor  
Josias H. Richards.  
per Cha. W. Fowler  
Attorney.

(No Model.)

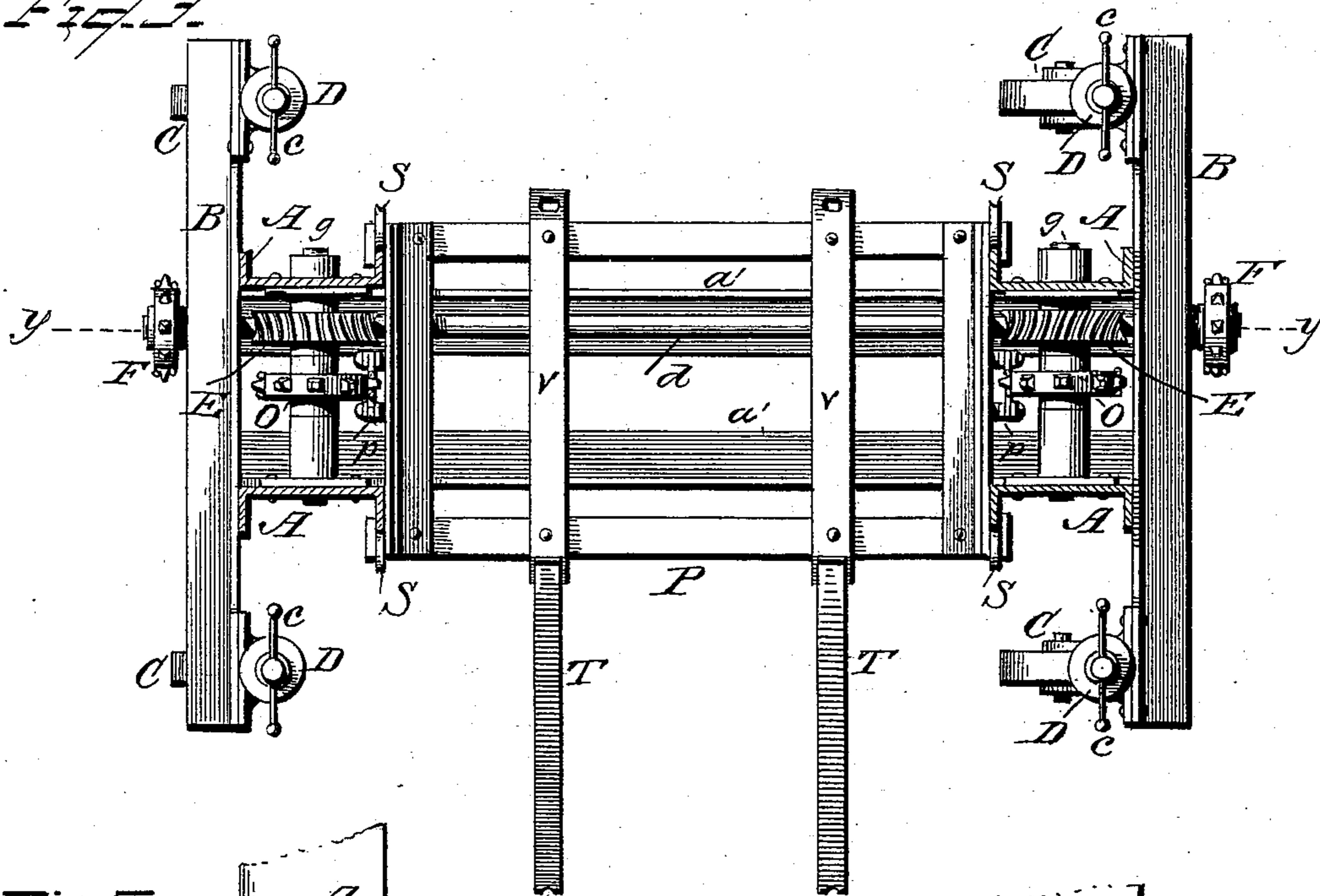
3 Sheets—Sheet 3.

J. H. RICHARDS.  
ELEVATOR.

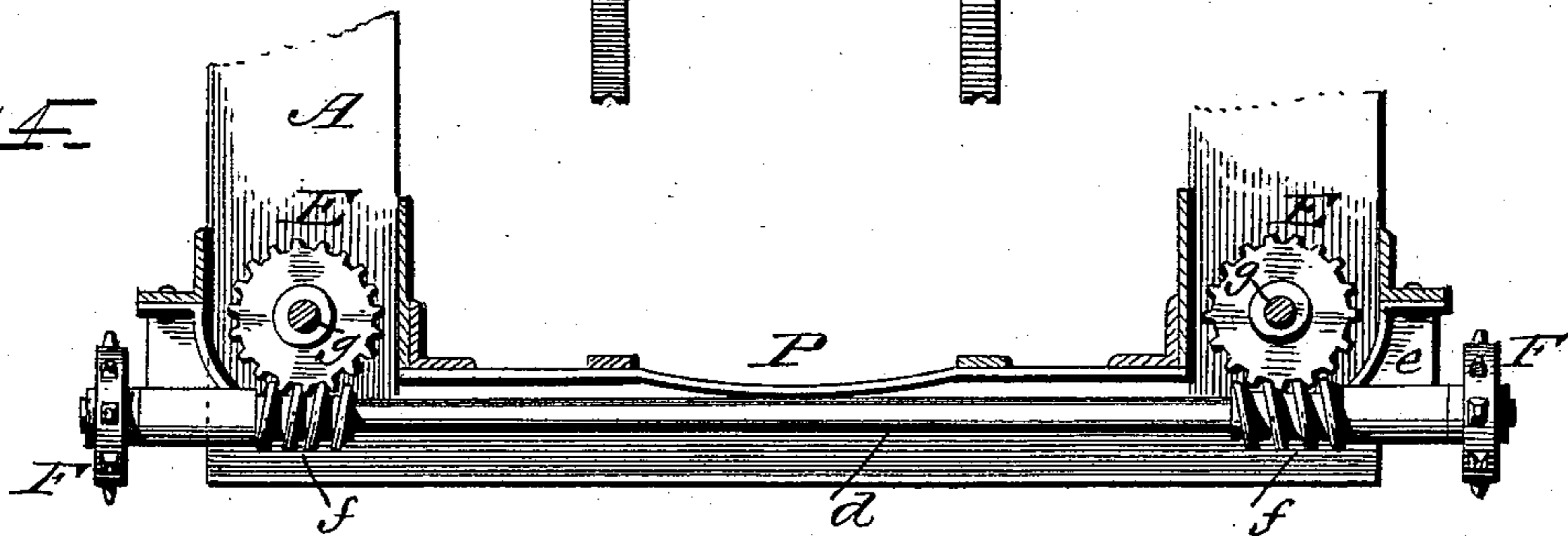
No. 541,683.

Patented June 25, 1895.

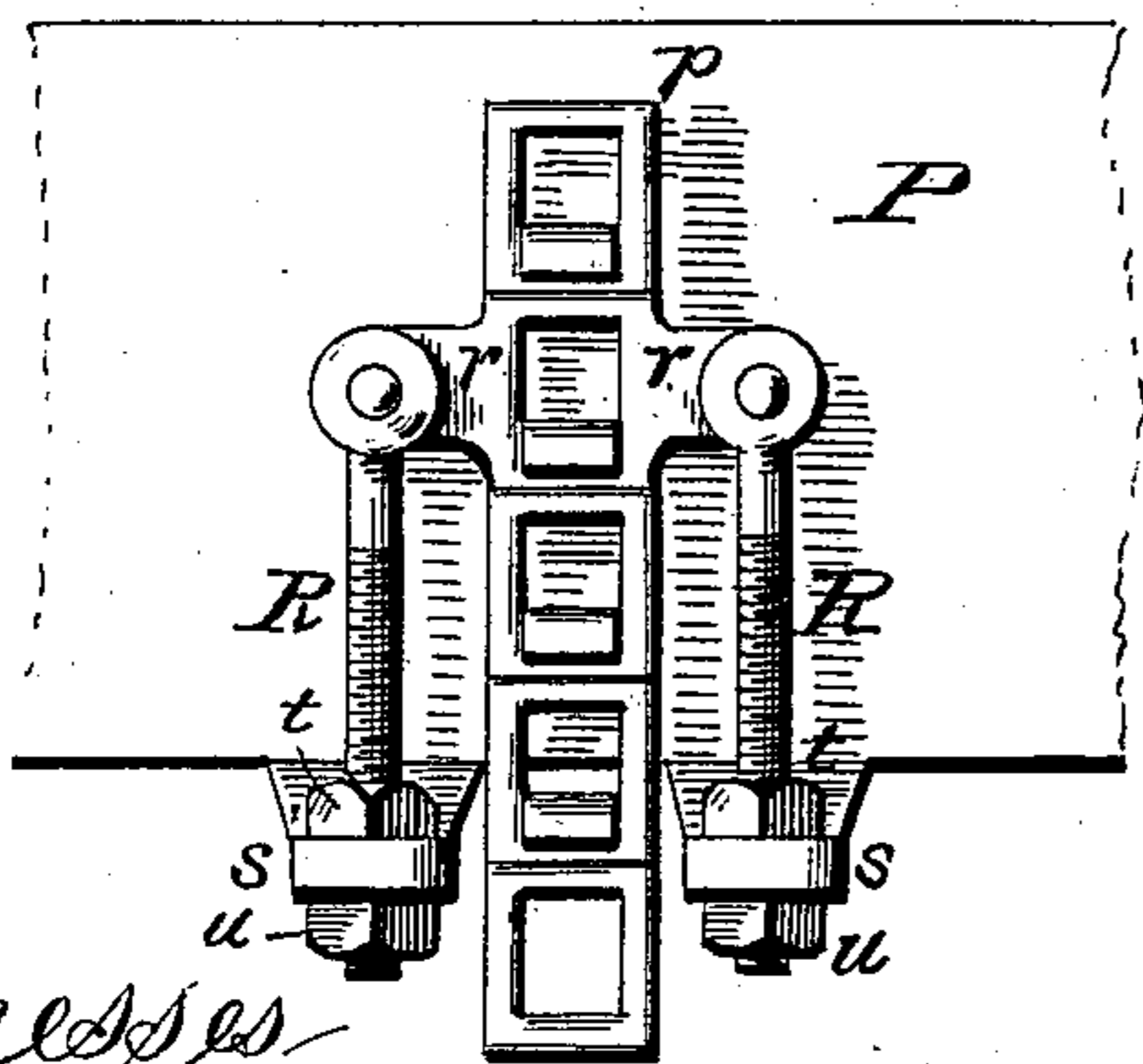
*Fig. 3.*



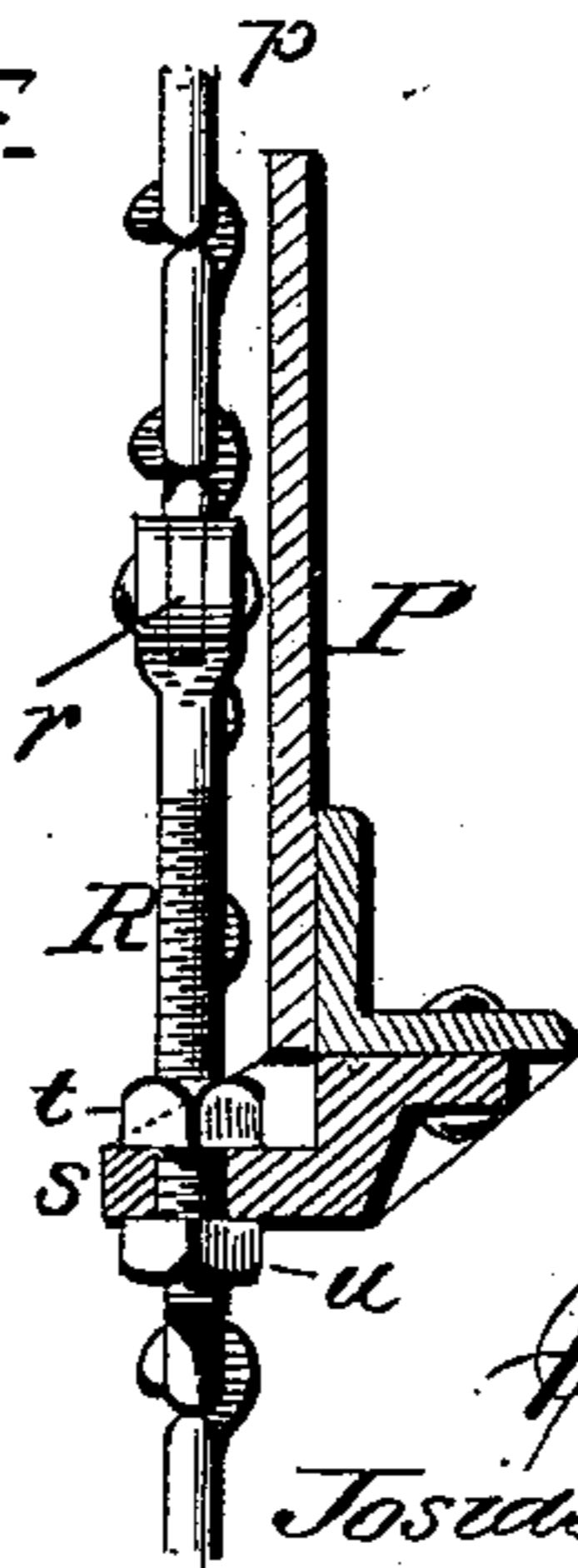
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses  
C. Williamson  
E. George Lind

Inventor  
Josiah H. Richards.  
per  
Chas. H. Fowler  
Attorney.

# UNITED STATES PATENT OFFICE.

JOSIAS H. RICHARDS, OF ELMIRA, NEW YORK.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 541,683, dated June 25, 1895.

Application filed May 6, 1895. Serial No. 548,193. (No model.)

*To all whom it may concern:*

Be it known that I, JOSIAS H. RICHARDS, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Elevators; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The present invention has relation to that class of stationary or portable elevators adapted for raising or lowering any kind of merchandise or for any like purpose for which such an elevator may be found useful.

It is the object of the invention to provide a simple and effective means for raising or lowering the elevator platform, means for adjusting the platform to bring it to a horizontal position, and means for adjusting the height of the casters to bring the elevator to a level or horizontal position upon uneven floors or adapt it to the unevenness of the ground upon which the elevator rests.

The invention consists in a portable or stationary elevator constructed substantially as shown in the drawings and hereinafter described and claimed.

Figure 1 of the drawings represents a side elevation of an elevator constructed in accordance with my invention, the platform thereof being shown in a lowered position ready to receive its load or merchandise; Fig. 2, a side elevation at right angles to that of Fig. 1; Fig. 3, a horizontal section taken on line  $x x$  of Fig. 2; Fig. 4, a vertical section taken on line  $y y$  of Fig. 3; Fig. 5, a detail view on an enlarged scale, showing a portion of the elevator-platform and sprocket-chain and means employed for leveling the platform; Fig. 6, a vertical section thereof; Fig. 7, a detail view partly in section showing one of the casters and means for adjusting it.

In the accompanying drawings A represents four upright beams or standards either of wood or metal, but preferably of channel or angle iron, which together form or constitute the frame of the elevator which may be of any suitable size or height. The elevator frame may be strengthened by truss-rods  $a$  and at its

lower end by braces  $a'$  of heavy angle iron which hold the upright beams rigid.

I have described one of many forms of elevator frames that may be used in connection with the features embodying my invention, and consequently such frame may be variously modified or changed in its details of construction and any form of frame may be substituted without departing from the principle of my invention.

Connected to the frame near its lower end are suitable horizontal beams B, the ends of which project beyond the sides of the elevator frame and have connected thereto suitable casters C.

To adapt the elevator frame to any incline in the floor or ground upon which such frame is to rest or any unevenness therein so that the frame will assume a true horizontal position, rest on the floor or ground perfectly level, or otherwise enable the frame to be brought in proper position for the operation of the elevator platform, there is provided means for vertically adjusting the casters. The means herein employed and which are considered the most simple and practical, consist in the adjusting screw  $b$  with suitable means for operating or turning the screw, as shown at  $c$ . In Fig. 7 of the drawings is shown more clearly one of the casters and its connections, the adjusting screw  $b$  engaging with a screw threaded hole in a bushing D, which bushing is connected to the end of the beam B. There are four of these casters C which may be of any of the usual forms and by turning the screw  $b$  in the proper direction, the caster will be raised or lowered and will in turn raise or lower that end of the frame as the unevenness in the floor or ground requires, thereby leveling the elevator frame so that it will assume a horizontal position, and thus adapt it to uneven floors or to any unevenness in the ground upon which the elevator rests. Any suitable and well known means may be employed for vertically adjusting the casters although that shown is considered the most simple and practical.

Near the lower end of the elevator frame is a horizontal worm shaft  $d$  which is supported in suitable bearings  $e$  upon the frame, or in any other manner connected thereto that will

enable said shaft to revolve upon its axis. This shaft has two worms as shown at *f*, which are made fast to shaft *d*, one of said worms having a right hand thread and the other worm a left hand thread and engage respectively the worm-wheels E upon separate shafts *g*. The shafts *g* extend horizontally and at right angles to the shaft *d* and are located between the upright beams or standards A and have their bearings therein, as shown in Fig. 3 of the drawings. The worm-shaft *d* is operated by means of sprocket-chains *h*, which chains engage with sprocket-wheels F upon the ends of the shaft and with sprocket wheels G upon short shafts *i* respectively. The shafts *i* have their bearings in plates H adjustably connected to the beams or standards A upon opposite sides of the frame, and are rendered adjustable by elongated slots *k* and bolts *l* or by any other well known means, this adjustment enabling any slack in the sprocket-chain to be taken up. The short shafts *i* at their ends are flat sided to receive a suitable crank-handle I for turning said shaft. On the shafts *i* between the sprocket-wheels G and plates H, are suitable gear wheels K which are adapted to engage with larger gear wheels L upon short shafts *m*, which shafts also have their bearings in the adjustable plates H. The shafts *m* at their ends are also flat sided to receive the crank-handles I, which are transferred from the shafts *i* to the shafts *m* when it is desired to increase the speed of the worm shaft *d* in raising or lowering the elevator platform hereinafter described.

At the upper end of the elevator frame and upon each side thereof is a sprocket-wheel M, said wheels having bearings in plates N which are adjustably connected to the beams or standards A for the purpose of taking up any slack in the sprocket chains *p*, which chains engage with the sprocket-wheels M and also sprocket wheels O upon the same shafts which carry the worm-wheels E. The plates or brackets N may be rendered vertically adjustable in any suitable and well known manner, such for instance, as slots *n* in the beams or standards, and bolts and nuts, as shown at *o*. The sprocket-chains *p* are fastened to the elevator platform P, which platform may be of any preferred construction, and as the sprocket-chains move up or down, the platform will be carried with them.

In carrying heavy weights or from other causes, it frequently happens that the platform will become out of level and to bring it back to a level or horizontal position, there is provided adjusting screw or screws R. These screws are pivoted to laterally extending ears *r* upon one of the links of the sprocket-chain *p* and extend down through plates *s* secured to the elevator-platform P. Nuts *t* and *u* engage with the screws R above and below the plate *s*, as shown in Figs. 5 and 6 of the drawings, and by screwing up the nuts on the screws or turning them in the proper direc-

tion, the platform P can be leveled or brought to a horizontal position. I have shown what is considered the most simple means of adjusting the elevator platform, although other means may be provided or any change or modification therein may be made as would come within ordinary mechanical skill.

The elevator platform P is provided with suitable guide-rollers S which bear against the beams or standards A and decrease the friction when the platform is in motion.

The platform P has transverse bars *v* which are suitably connected thereto and with the ends of said bars slotted which project over the sides of the platform. The slotted ends of these bars are to admit the pins or claws *w* upon the under side of skid-arms T to engage therewith, or any suitable device may be connected to the platform and in any manner found most convenient that will enable the merchandise to be easily loaded on the platform. The arms T may be conveniently detached from the bars *v* and connected to the opposite end of said bars as circumstances require in loading from either side of the frame or platform.

The devices employed for operating the elevator-platform, consisting of the worm-shaft, the worm-wheels, sprocket wheels and chains, as well as the means for leveling or adjusting the elevator platform; may be employed on a stationary as well as a portable elevator; the shaft with its double right and left hand worms being considered of material importance as it is more effective in its operation besides preventing all end thrust or end friction. When the crank-handles I are turned, the worm-shaft *d* will be operated through the medium of the sprocket-chains *h* and the sprocket-wheels F G with which they engage. The worm shaft *d* being thus operated, the worms *f* thereon will in turn operate the worm-wheels E and turn the shafts *g* to which said wheels are connected. The shafts *g* being operated as above described will revolve the sprocket-wheels O, and as said sprocket wheels engage with the sprocket-chains *p*, said chains will be raised or lowered and carry with them the elevator platform P.

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

1. An elevator consisting of a suitable upright frame, a suitable platform, and means for operating said platform, consisting of a horizontal shaft and a right and a left hand worm thereon, means for operating said shaft, transverse shafts connecting with the platform through sprocket-chains and wheels, and worm-wheels upon the transverse shafts engaging with the right and left hand worms, substantially as and for the purpose set forth.

2. An elevator consisting of a suitable upright frame, a suitable platform, and means for operating said platform, consisting of a horizontal shaft having a right and a left hand

worm thereon, transverse shafts having worm-wheels engaging said worms, sprocket wheels upon the transverse shaft, sprocket-chains secured to the platform and engaging the sprocket wheels, and means for operating the worm-shaft, substantially as and for the purpose described.

3. An elevator consisting of a suitable upright frame, a suitable platform, sprocket-wheels and chains for operating the platform, and means for securing the platform to the chains and leveling said platform, substantially as and for the purpose specified.

4. An elevator, consisting of a suitable upright frame, a suitable platform, sprocket chains and wheels for operating said platform, and means for adjusting or leveling the platform, comprising adjusting screws pivoted to ears upon one of the links of the chain, the screws extending down through plates projecting from the platform, and nuts engaging with the screws above and below the plates,

substantially as and for the purpose described.

5. An elevator, consisting of a suitable upright frame, a suitable platform, means for operating the platform, consisting of a shaft having right and left hand worms thereon, transverse shafts having worm-wheels to engage with the worms, sprocket wheels and chains connecting the transverse shafts with the platform, means for operating the worm-shaft, means for adjusting the platform, and casters upon the lower end of the frame and means for vertically adjusting them, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOSIAS H. RICHARDS.

Witnesses:

L. A. MERRILL,  
JAMES R. COLBURN.