

J. ELSNER.
LIFTING AND TRANSPORTING APPARATUS.
APPLICATION FILED OCT. 14, 1904.

900,061.

Patented Sept. 29, 1908.

Fig. 1.

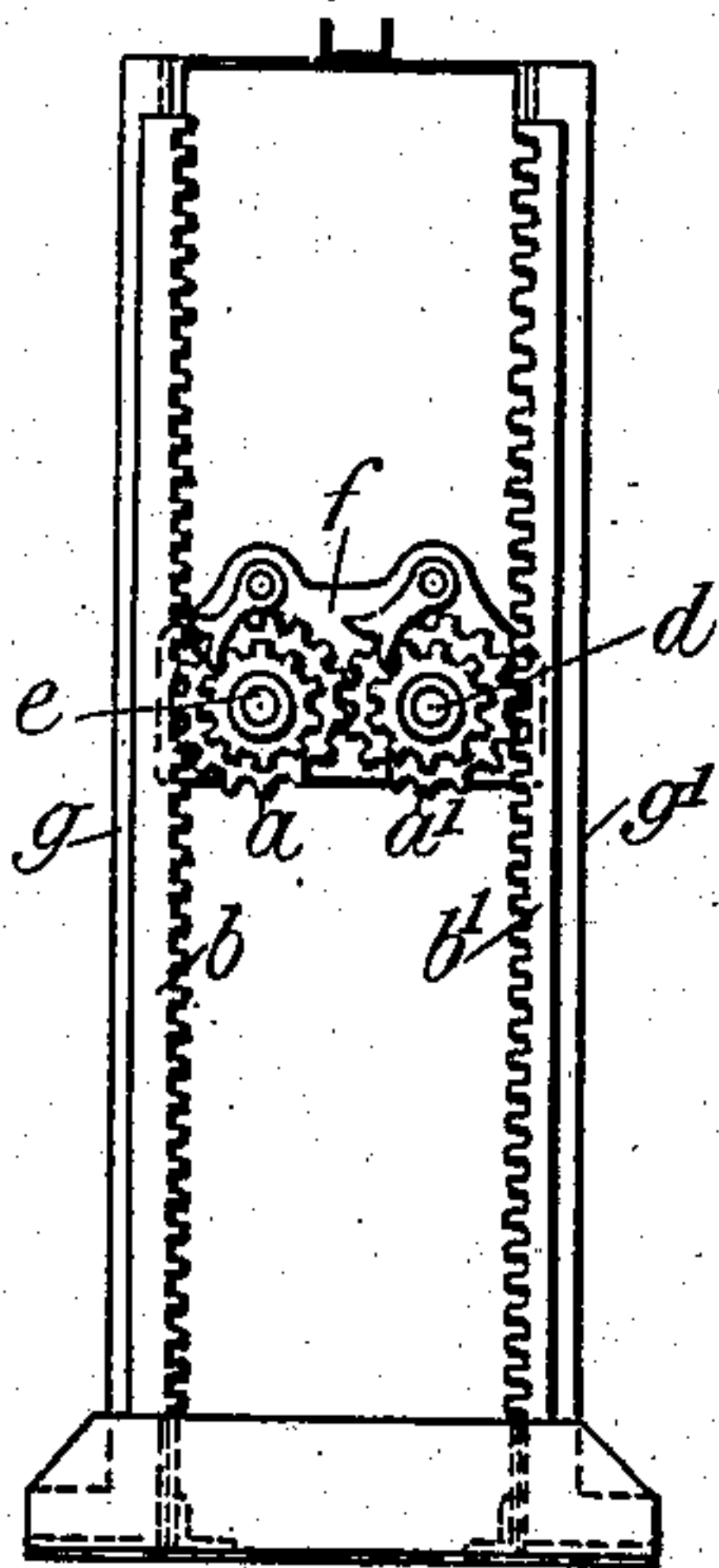


Fig. 2.

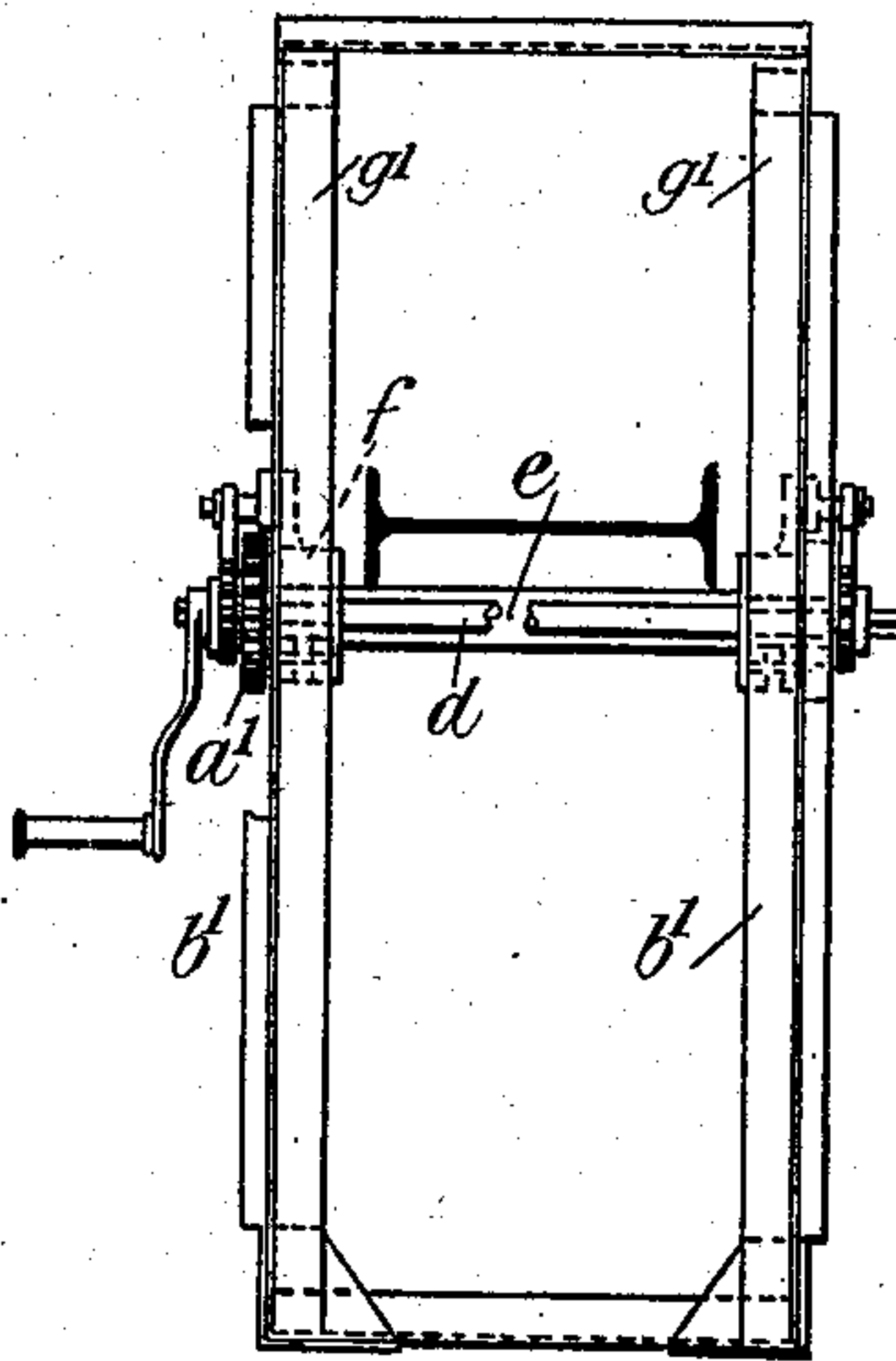


Fig. 3.

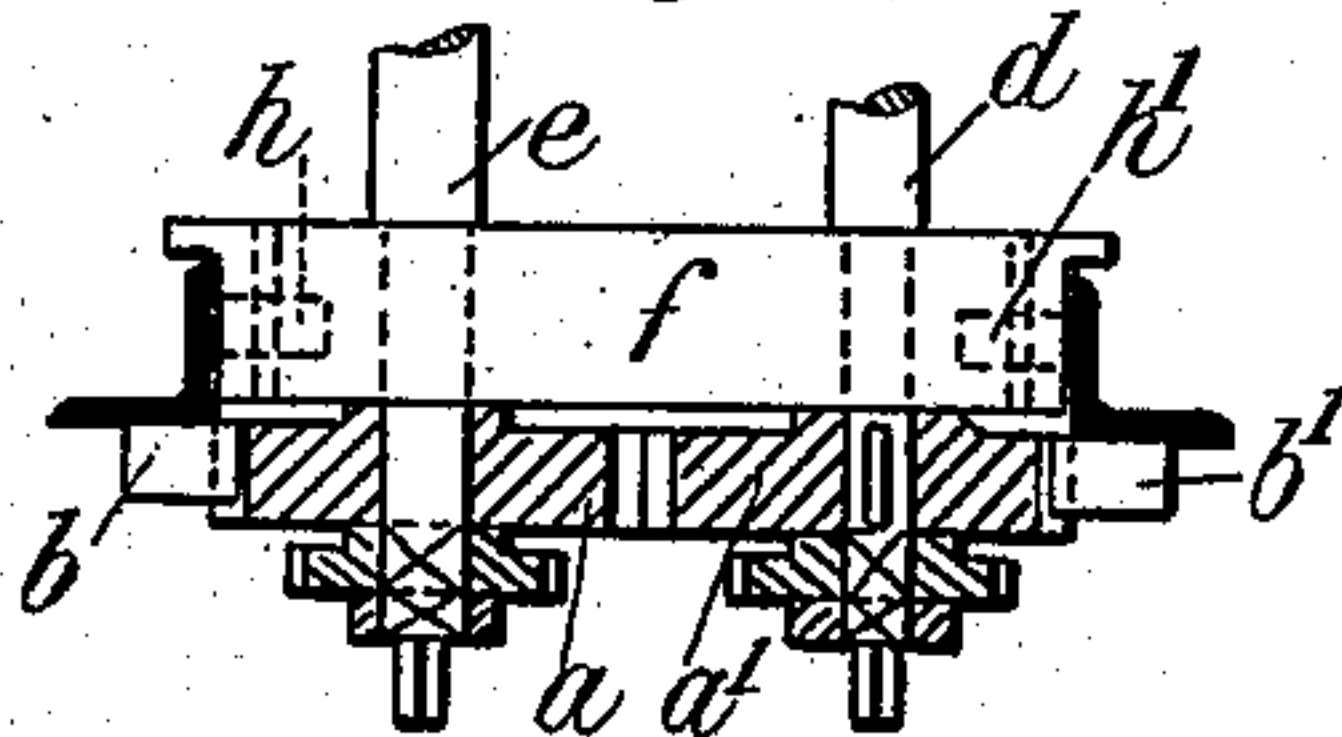


Fig. 4.

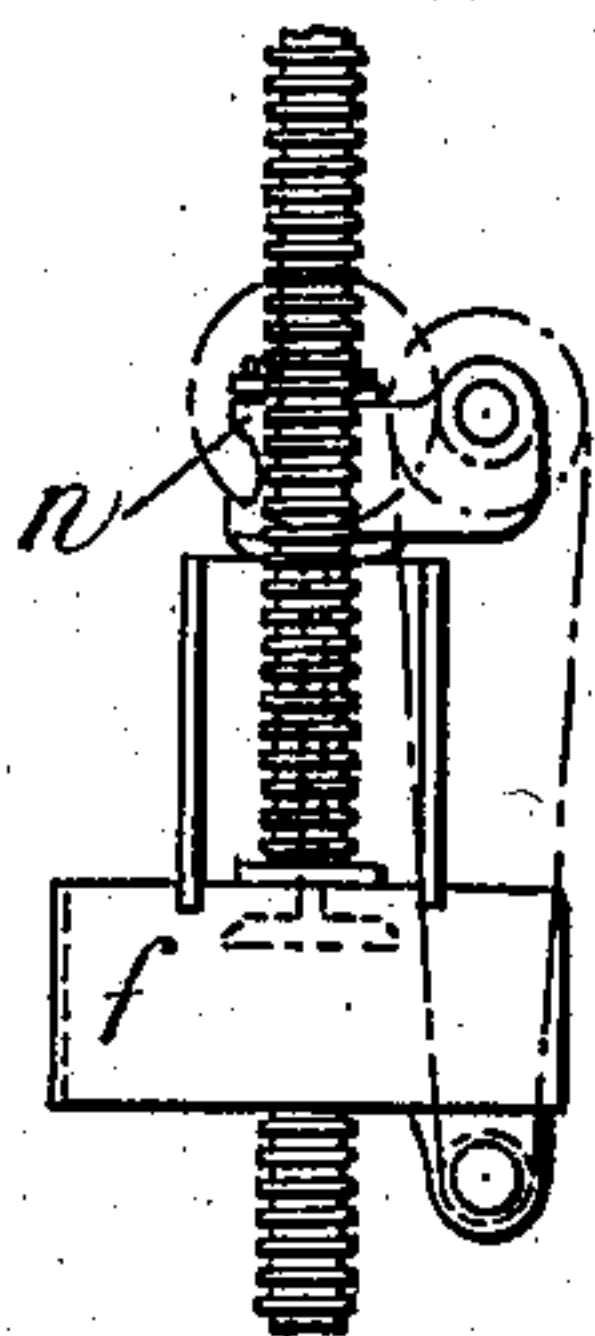


Fig. 5.

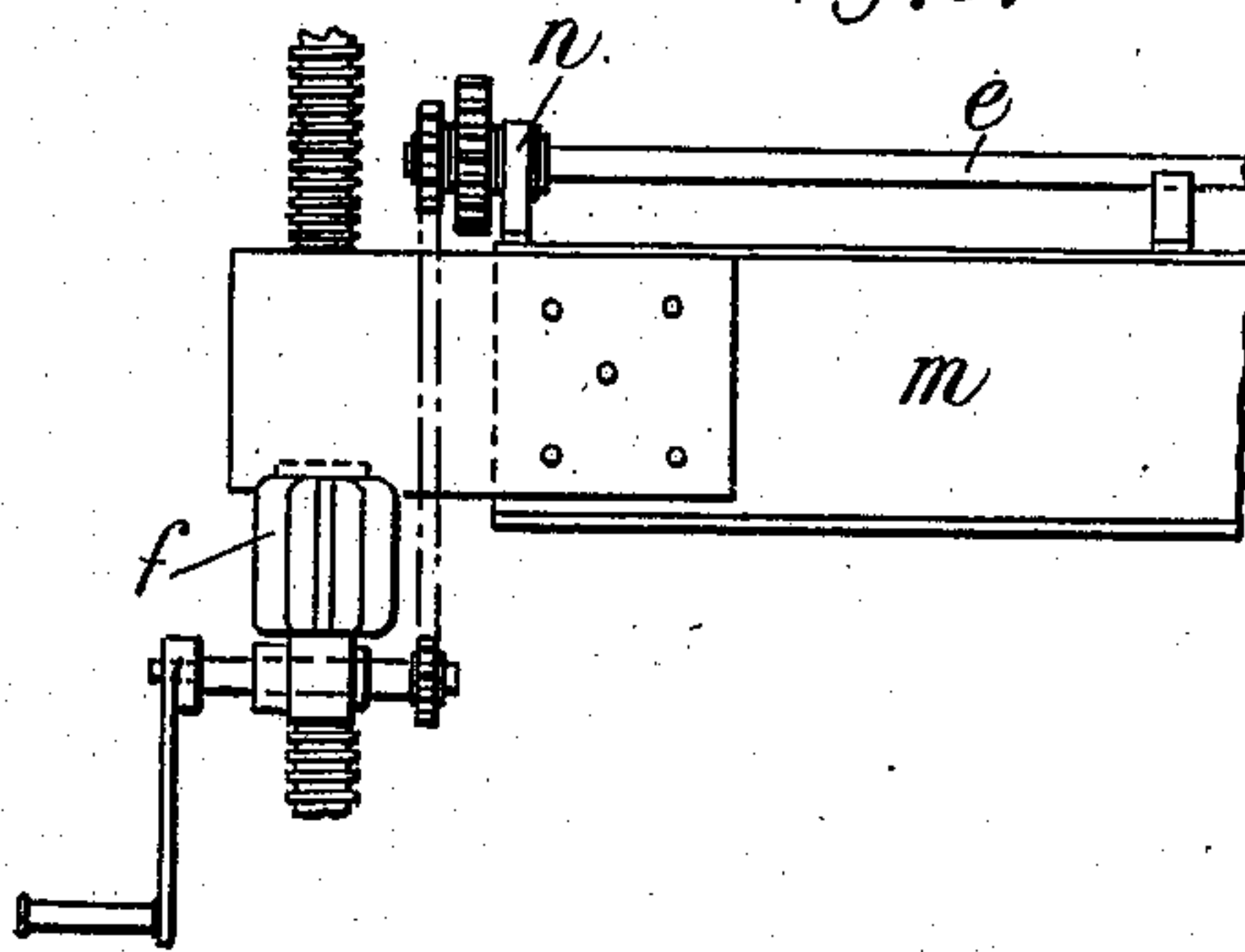
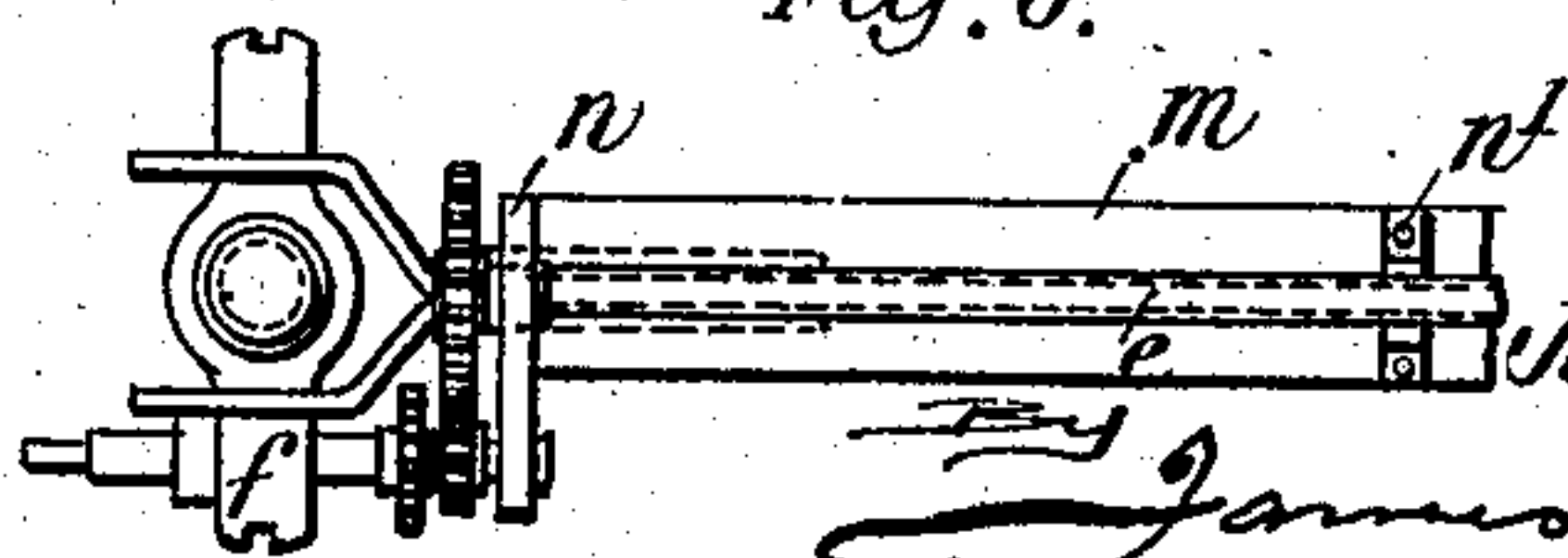


Fig. 6.



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UNITED STATES PATENT OFFICE.

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LIFTING AND TRANSPORTING APPARATUS.

No. 900,061.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed October 14, 1904. Serial No. 228,462.

To all whom it may concern:

Be it known that I, JOSEPH ELSNER, a subject of the Emperor of Germany, residing at 51 Fennstrasse, Berlin, in the Empire of Germany, engineer, have invented certain new and useful Improvements Relating to Lifting and Transporting Apparatus, of which the following is a specification.

This invention relates to lifting and transporting apparatus more particularly applicable for use with heavy articles or loads.

Lifting and transporting appliances as hitherto constructed for hoisting heavy loads, such as locomotives, boilers, pillars, girders and the like, for all practical purposes, only permit of the displacement of the object to be hoisted either upwards or downwards, but not of its displacement or travel in a lateral direction to the right or left hand.

This invention has for its object to obviate this defect and to provide a device for effecting the aforesaid lateral displacement of the work in the frame of the lifting appliance, or appliances, when employing more than one, so that it is no longer necessary to produce lateral displacement by the efforts of a number of workmen or by means of some other source of power independent of the hoist. At the same time the action of this device is independent of the height to which the load has been raised and the load is rendered capable of being displaced within wide limits.

With a view to obtaining the results enumerated above, the platform of the lifting clutches, hoist carriers or the like are provided in the known manner with rollers rotatable in bearings, upon which rollers the load or work is placed. In order to render the load laterally displaceable upon this roller track with certainty and exactness at any desired height, there is arranged upon the platform or upon the frame of the lifting appliance, gearing adapted for effecting a lateral movement. The pillars of the frame of the hoisting appliance or appliances must be of such formation that they leave a free path for the load.

Hoisting apparatus in accordance with this invention is illustrated, by way of example, in the accompanying drawings, in which:—

Figures 1, 2 and 3 represent a pair of frames employed for lifting girders, in side elevation, front elevation and plan respectively. Figs. 4, 5 and 6 are respectively an

end view, front view and a plan illustrating a modification of the lifting appliance.

Referring to Figs. 1, 2 and 3, upon each of the parts *g* and *g'* of the frame which are rigidly connected the one with the other at their lower part, are arranged two spur wheels *a*, *a'* and two racks *b*, *b'*, by means of which the load may be raised and lowered in the known manner, a small or comparatively light shaft *d*, passing from one frame to the other, transmitting the motion from the one side to the other, the load resting upon the larger or stronger shaft *e*. Both shafts are formed with a square upon their extremities for the reception of cranks or ratchet levers. In order that the larger shaft may not participate in the rotation when lifting takes place, the gear wheel mounted upon it and engaging with the toothed rack is arranged in such a manner as to rotate freely.

Instead of two shafts arranged side by side, a single shaft may be employed arranged within a sleeve. In this case however considerable friction would result and risk of bending the sleeve.

The bearings for the shafts *d* and *e* are situated in the clutches *f*, the guides for which slide along the walls of the frame. In order to permit the clutches to slide freely upon the frame, rollers *h*, *h'* are also provided.

While by rotating the crank of the shaft *d* the load may be raised and lowered in the usual manner, a rotation of the shaft or roller *e* produces a lateral displacement of the load resting upon it, this load, owing to the friction produced thereby, being caused to roll along. The shaft *e* acts therefore as a mechanically operated conveyer roll, by means of which the displacement of the load may be effected very exactly by predetermined amounts, for example for the purpose of drilling holes in girders.

For lifting purposes it is of course possible to employ other devices generally used in hoisting appliances, such for example, as screw spindles with hand wheel, worm gear and the like; driving may also be effected by means of counter shafts or in some cases with mechanical power as in other hoisting appliances.

For the purpose of moving long pieces of work, several such devices are preferably employed, in which case by displacing the hoisting appliances large distances may readily be covered, and obstacles and openings in the

flooring passed over if not too great. The work may also be moved to higher points, by imparting to it in the first place the necessary inclined position, as it is immaterial within the angle of friction, whether one appliance stands higher than the other. With the same end in view, however, by suitably raising one end the work may always be kept horizontal, and by the displacement and raising of the appliances the load may be raised step by step or gradually during transport. The arrangement may also be such that lifting and displacement of the load take place simultaneously; in addition to this, it is not indispensable for the displacement that the shafts should be rotated, for the shafts or rollers *e* may remain loose and the load drawn over the roller *e* by means of chain or rack gearing or the like situated upon one of the lifting clutches or a suitable frame.

For erecting purposes it is preferable not to rigidly connect the frames *g* and *g'*, but to arrange them separately. In this case, it is of course no longer possible to effect simultaneous driving by means of a continuous shaft *d*, and raising and lowering take place separately from each side, either by the intermediary of gear wheels or screw spindles or the like, as already explained, or in the known manner by means of jacks. The shafts *e* may then be made of any desired length so that room may be afforded for dealing with large sheets or plates and other unwieldly objects. In so far as the driving mechanism is mounted upon the shaft *e*, it must in this case be made displaceable upon the shaft, so that the frames may be arranged nearer together or further apart according to requirements.

Referring to Figs. 4, 5 and 6, the constructional form illustrated therein is intended for lifting vehicle bodies or other heavy objects of a similar kind. Hitherto in such lifting

appliances, the support has usually been furnished by a beam *m*, Figs. 5 and 6, carried by the two nuts *f* formed of riveted plates or the like. If it is desired to employ a conveyer shaft such as *e*, in accordance with this invention in such lifting appliances, this may be readily effected by providing the beam with bearings shown at *n* and *n'* for the shaft *e*. For the purpose of displacing or feeding the work, appropriate gear mechanism, chain mechanism or the like may in this case advantageously be employed, as shown in Figs. 4, 5 and 6.

As security against incorrect displacement of the shafts locking wheels and locking pawls may be provided.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In lifting apparatus, the combination of vertically arranged frames, gearing coöperatively connected with the upright portions of the said frames, a roller extending between and supported by the frames and adapted to be raised and lowered by the gearing, and toothed gearing for operating the said roller rotatively.

2. In lifting apparatus, the combination of vertically arranged frames having racks thereon, a roller extending between the frames, gear wheels operatively connected with the roller, another roller also extending between the said frames, gear wheels operatively connected with the said second roller, carriers adapted to slide in the aforesaid frames, and means adapted to hold the one roller inoperative while the other is being worked.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses this 27th day of September 1904.

JOSEPH ELSNER.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.