

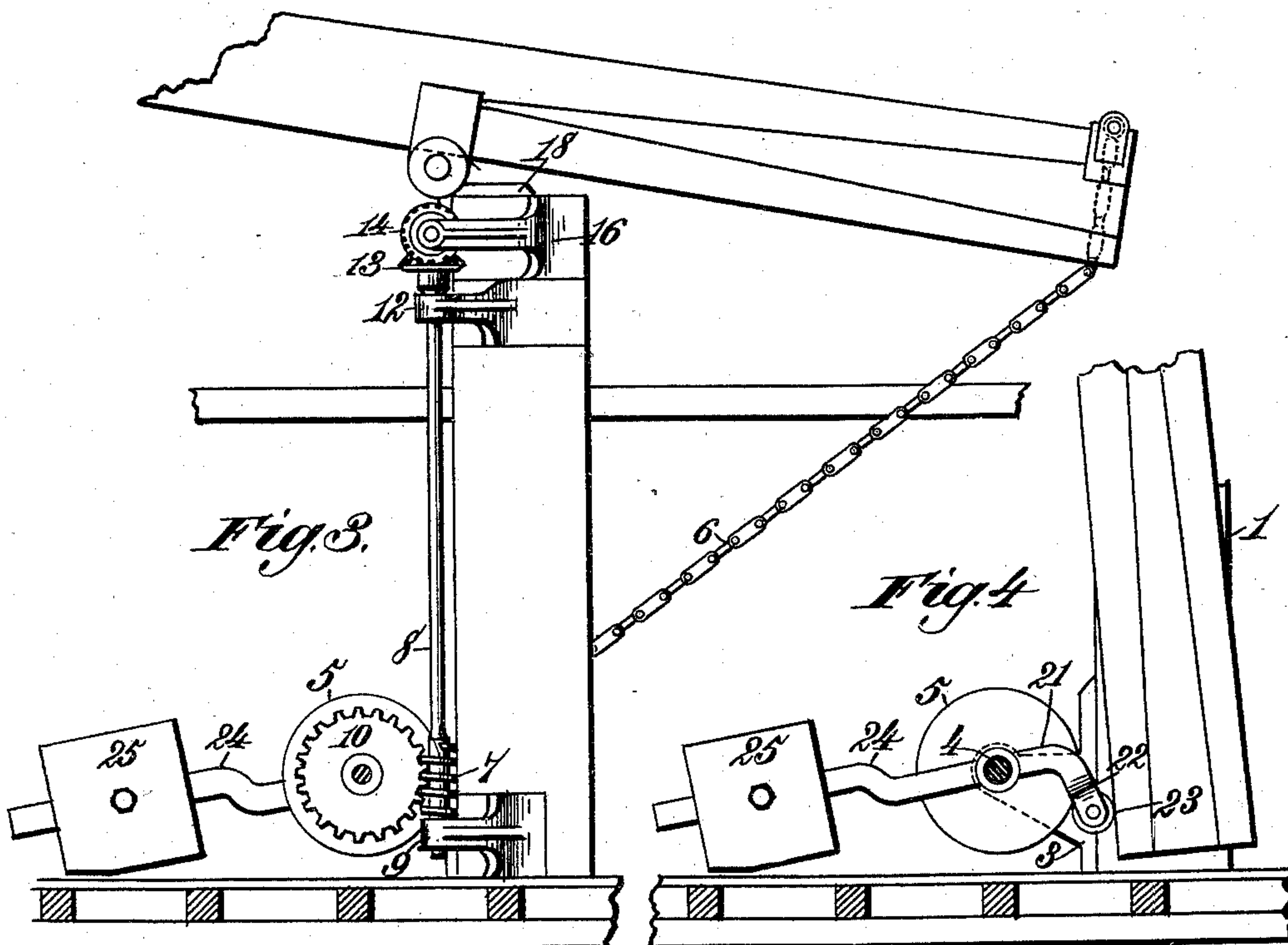
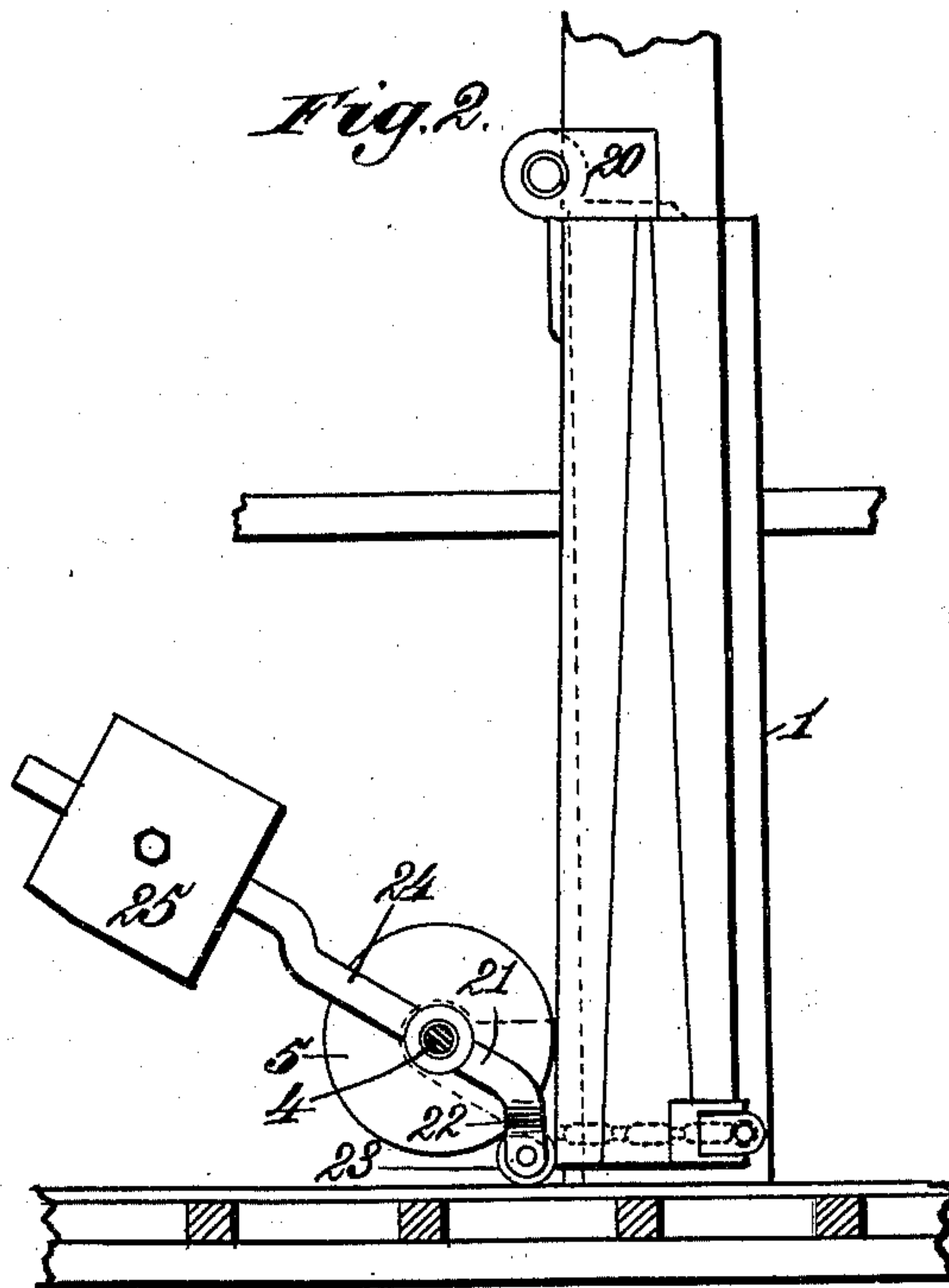
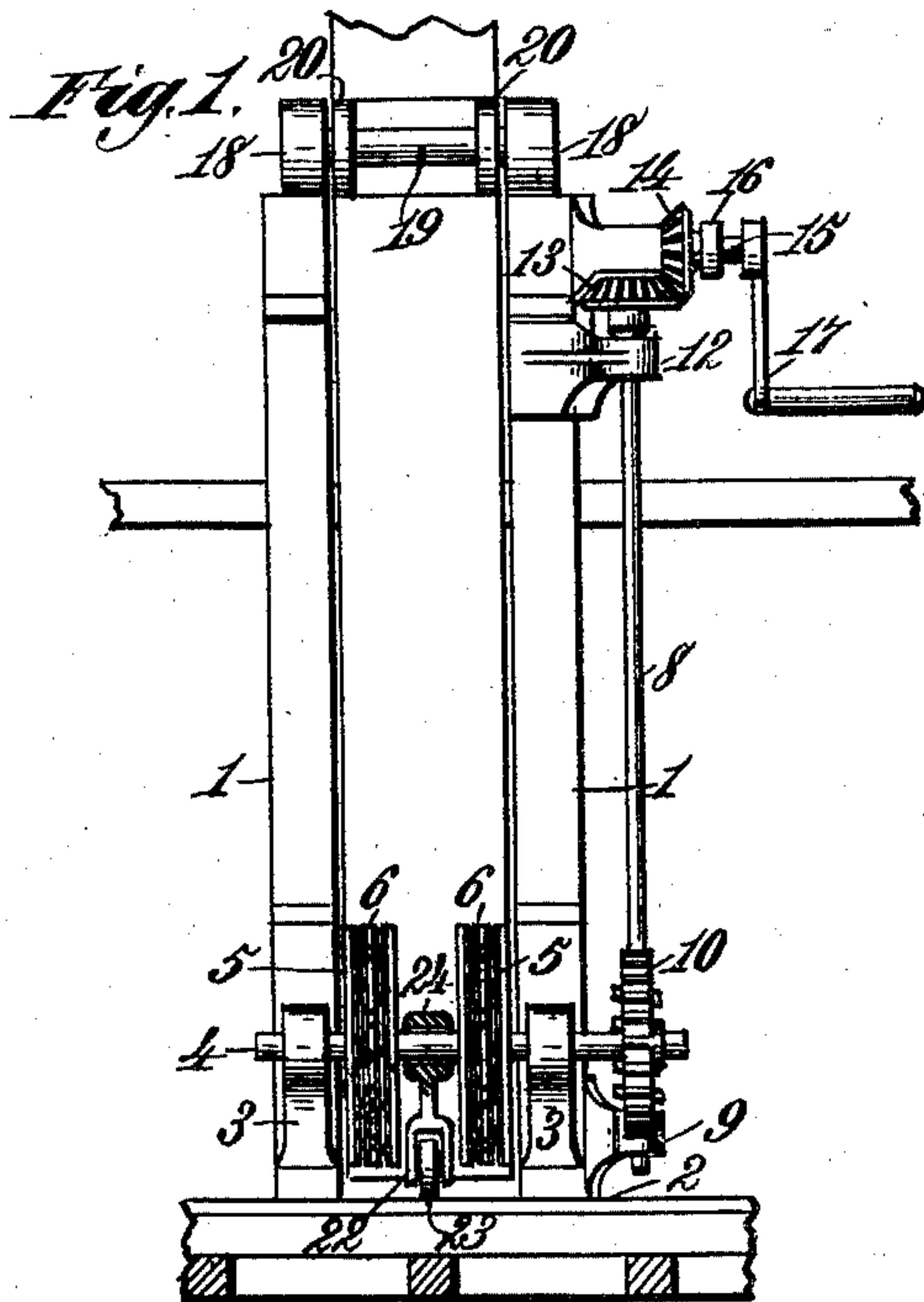
(No Model.)

F. UHLIG.

LIFT OR HOIST FOR PLACING SHIPS' MASTS.

No. 477,477.

Patented June 21, 1892.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## LIFT OR HOIST FOR PLACING SHIPS' MASTS.

SPECIFICATION forming part of Letters Patent No. 477,477, dated June 21, 1892.

Application filed February 24, 1892. Serial No. 422,677. (No model.)

*To all whom it may concern:*

Be it known that I, FRANZ UHLIG, engineer, a citizen of Austria-Hungary, residing at Topkowitz, near Bodenbach, in the Kingdom of Bohemia, Austria-Hungary, have invented certain new and useful Improvements in Lifts or Hoists for Placing Ships' Masts; 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.

My invention relates to mechanical lifts or hoisting apparatus, the purpose thereof being the provision of a mechanism whereby the masts of a ship or any other body having considerable weight and length may be easily raised into vertical position, or approximately so, and then lowered until it rests in a seat or support provided for it.

It is a further purpose of my invention to combine with a mechanical lift means whereby the larger end of the mast, after it is raised, shall be arrested by an adjustable lever carrying an anti-friction pulley which abuts against the base of the mast and rolling thereon as the latter is lowered, being part of the mechanism.

It is my purpose, in short, to provide a simple easily-operated apparatus capable of being used without the employment of a force of men, the driving-shaft being revolved usually and with average loads by a single person.

The invention consists in the several novel features of construction and new combinations of parts hereinafter fully described, and then particularly pointed out in the claims annexed hereto.

To enable others skilled in the art to which my said invention appertains to understand and to make, construct, and use the same, I will now proceed to describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of a lift organized in accordance with my invention, showing the lower portion of the mast in upright position. Fig. 2 is a central vertical section of the same parts. Fig. 3 is a side elevation illustrating the mode of operation of said machine. Fig. 4 is a vertical section of part of the mechanism shown in Fig. 4 to illustrate the action of the weighted stop-lever.

The reference numeral 1 in said drawings indicates the uprights or posts of the lift, said posts being two in number and arranged in vertical parallelism, their lower ends being rigidly connected with the floor or with a base-plate 2 of any preferred form. Upon one side of the parallel posts 1, at or near the base, are brackets 3, in which are formed bearings for a horizontal shaft 4, upon which are mounted drums 5, lying in juxtaposition to the inner or adjacent faces of the posts, as shown in Fig. 1. These drums are adapted to receive chains 6, which wind thereon when the drums are revolved in the proper direction. This revolution is effected by means of a worm 7 upon a vertical shaft 8, the lower end of which is stepped in a bracket 9, so that the worm 7 may mesh with a worm-gear 10, fast upon the shaft 4. The upper end of the shaft 8 is supported by a bracket-bearing 12 at or near the top of one of the posts. Upon the end of said shaft 8 which projects above the bracket-bearing is mounted a bevel-gear 13, with which meshes a similar gear 14, carried by a horizontal driving-shaft 15, mounted upon a stud-bearing supported by a bracket 16 at or near the top of one of the posts. The shaft of this gear 14 is provided with a suitable crank 17.

Upon the upper ends of the posts 1 are mounted strong bearings 18, in which is arranged a fulcrum-shaft 19, parallel with the drum-shaft 4. Upon this shaft, close to the bearings 18, are rigidly mounted guard-plates 20 to prevent lateral displacement of the mast.

Upon the central portion of the drum-shaft 4, between the chain-drums, is loosely mounted a lever-arm 21, having the form of a bell-crank and provided at its end with a fork 22, in which is journaled a roll 23. From the hub of this arm projects the lever 24, and upon its end portion, lying farthest from the shaft 4, is mounted a considerable weight 25, adjustable on said lever. The lever-arm is normally held in the position shown in Figs. 3 and 4, in which the roll 23 is somewhat raised above the base-plate or floor and lies, in part, between the two posts 1.

In operating the lift the lower part of the mast is raised sufficiently to enable it to rest upon the fulcrum-shaft 19 its lower end projecting beyond said shaft a distance nearly



equal to the length of the posts 1, in order that its lower extremity shall pass, when the mast is upright, below the axis of the roll 23. The chains 6 are attached to a suitable clamp 5 connected to the foot of the mast, and by operating the shaft 15 by means of the crank 17 revolution is thus communicated to the vertical shaft 8, the worm thereon giving revolution to the chain-drums 5. The mast being 10 brought in this manner into vertical position, or nearly so, its base is brought against the roll 23, the yielding movement thereof raising the lever 24 to the position shown in Fig. 2. The gravity of the weight 25, however, 15 restores the lever 24 and lever-arm 21 to the position shown in Fig. 4. By this means the mast is held in the position it is to have when placed in its seat in the vessel, the "rake" of the mast being determined by the angularity 20 of the lever-arm 21. This is capable of variation by either substituting a different arm of greater or less angularity. By constructing the fork 22 upon the end of the lever-arm 21 of suitable length I may accomplish the same 25 result by substituting a roll of greater or less diameter for the roll 23. When the mast is raised to the position shown in Fig. 4, it can be lowered, still preserving said position by simply reversing the revolution of the chain- 30 drums 8. I have shown these chain-drums as separate elements; but it is evident that a single drum is the full mechanical equivalent thereof.

The lower part of the mast, which is, like 35 the remaining portion, of gradually-increasing diameter, is trimmed off upon two opposite sides to form two substantially parallel flat faces, beginning at a point at or a little beneath the fulcrum 19 and extending to the 40 lower end or heel of the mast. These flat substantially parallel faces are indicated in Figs. 2, 3, and 4 by lines diverging at a small angle from a point about coincident with the lower edges of the guard-plates 20. These 45 lines mark the boundaries of the flat faces referred to.

In hauling the mast from the position shown in Fig. 3 to that seen in Fig. 4 or in Fig. 2 it is evident that at some intermediate point the 50 gravity of the mast will tend to drop its heel upon the deck unless some support is provided. This support may be of any simple kind, and the guard-plates 20 may be utilized for such purpose.

55 When the mast is in position for lowering, as in Fig. 4, where it is shown as firmly locked

between the anti-friction roll 23 and the clamp to which the chains 6 6 are attached, it is very slightly inclined from the vertical and its friction upon the fulcrum 19, after the supporting- 60 fastening is cast off, is very small. Moreover, the force exerted upon the mast by the gravity of the part above the fulcrum 19 is acting at a considerable disadvantage by reason of the very small angle at which it acts. The gravity 65 of the mast as a whole is much in excess of the force tending to turn the same upon the fulcrum 19 and restore it to the position shown in Fig. 3, or approximately so. By maintaining a suitable tension upon the chains 6 6 at 70 the same time that they are so far slackened as to let the mast drop slowly it will descend in proper position to its seat.

What I claim is—

1. A lift or hoisting apparatus for raising 75 and lowering ships' masts, comprising chain-drums, a worm-shaft driving the drum-shaft, a fulcrum-shaft arranged in bearings on or near the top of uprights supporting the mechanism, and means for holding the raised mast 80 in an inclined position while it is being lowered, substantially as described.

2. In a lift or hoist for raising and lowering ships' masts, the combination, with a drum-shaft and chain-drums mounted on posts or 85 uprights, of a worm on a vertical shaft and meshing with a worm-gear on the drum-shaft, a fulcrum-shaft at or near the tops of the posts, and a counterbalanced lever-arm having a roll journaled on its end and adapted to en- 90 gage and hold the raised mast in a slightly-inclined position while it is being lowered, substantially as described.

3. In a lift or hoist for raising and lowering ships' masts, the combination, with chain- 95 drums mounted on a shaft having support upon uprights or posts, of a vertical shaft geared with the drum-shaft, a driving-shaft, a fulcrum-shaft for the mast arranged at or near the tops of the posts, a lever-arm loosely 100 mounted on the drum-shaft and having a roll journaled on its end and adapted to enter between the posts, and a lever rigid upon the hub of the lever-arm and having an adjustable weight, substantially as described. 105

In testimony whereof I affix my signature in presence of two witnesses.

FRANZ UHLIG.

Witnesses:

CARL FR. REICHELT,  
HERNANDO DE SOTO.