

(No Model.)

3 Sheets—Sheet 1.

T. HILL.  
LIMITATION STOP FOR ELEVATORS.

No. 581,958.

Patented May 4, 1897.

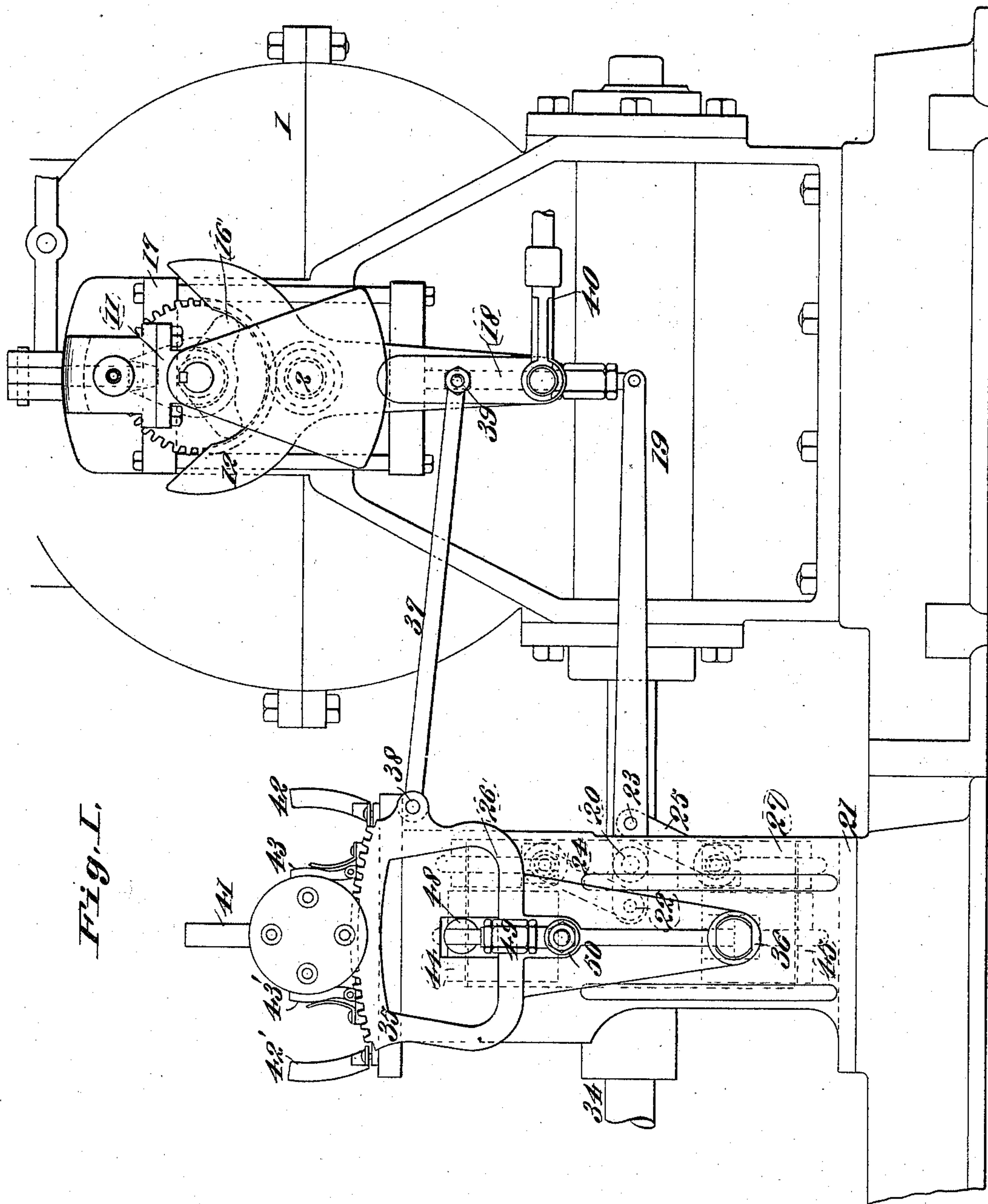


Fig. 1.

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*E. S. Knight*  
*N. F. Wiley*

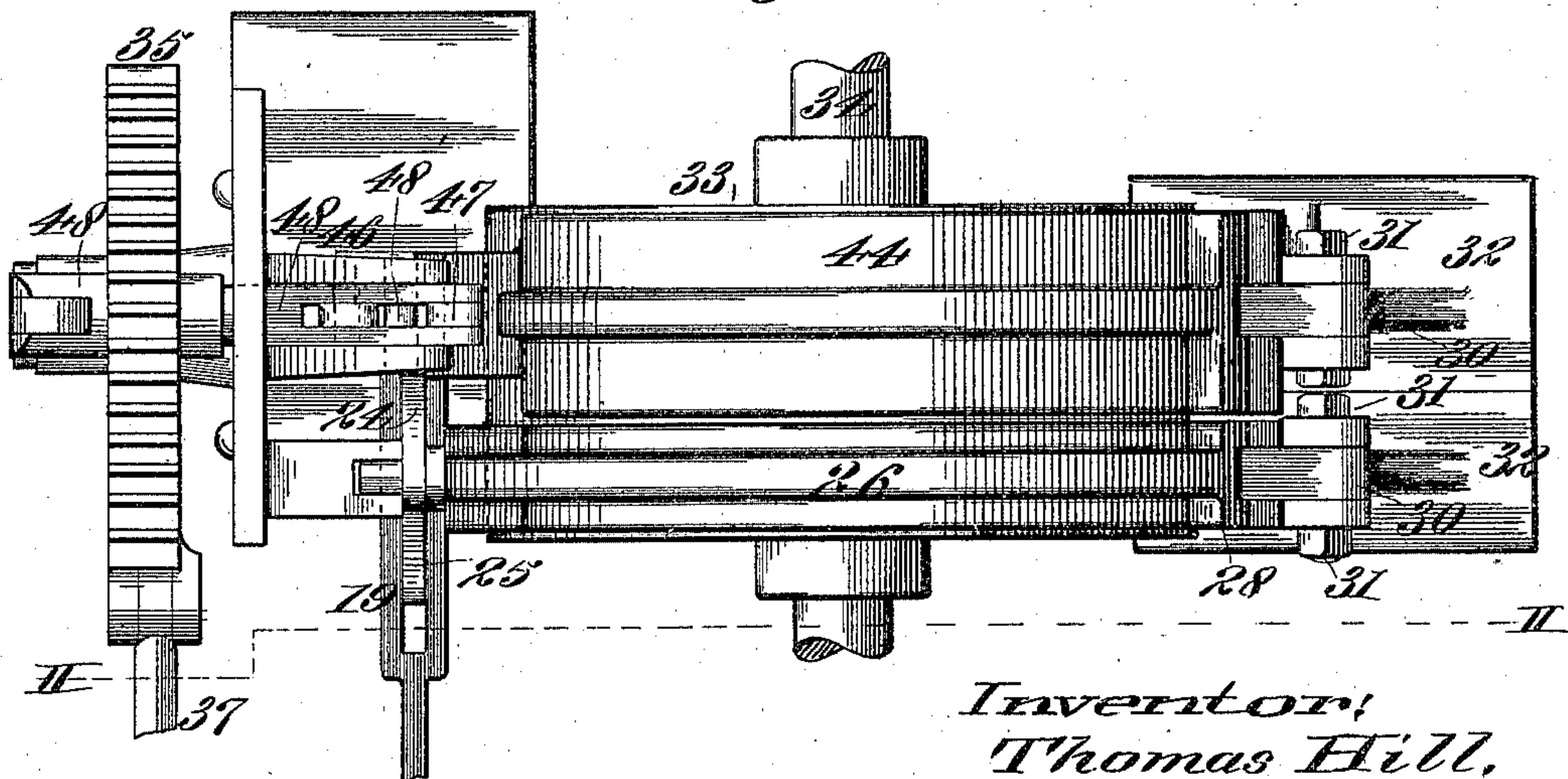
Inventor:  
*Thomas Hill*

By *Wright, Bro* attys

**3 Sheets—Sheet 2.**

No. 581,958.

Patented May 4, 1897.



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Fig. IV.

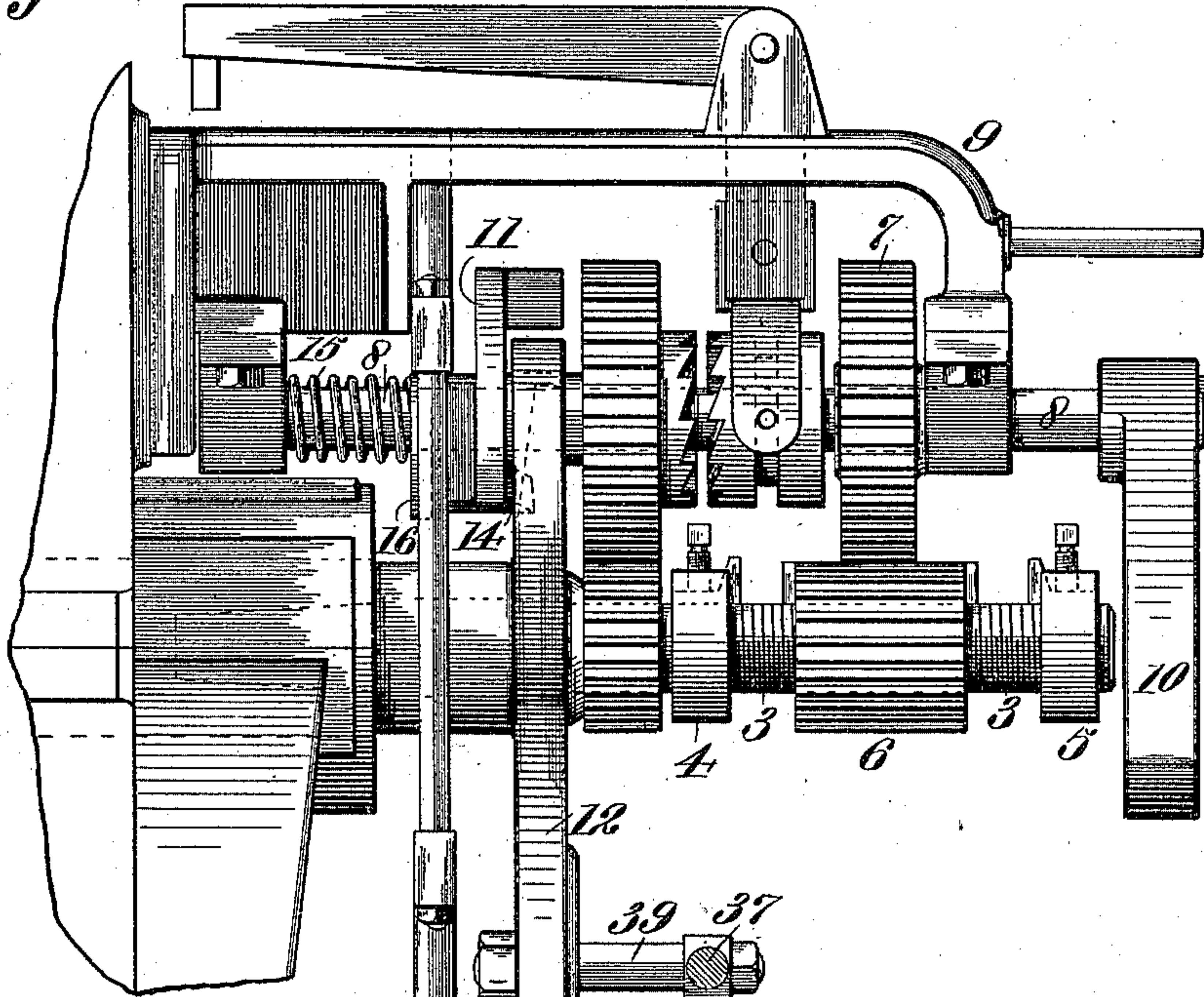


Fig. VII.

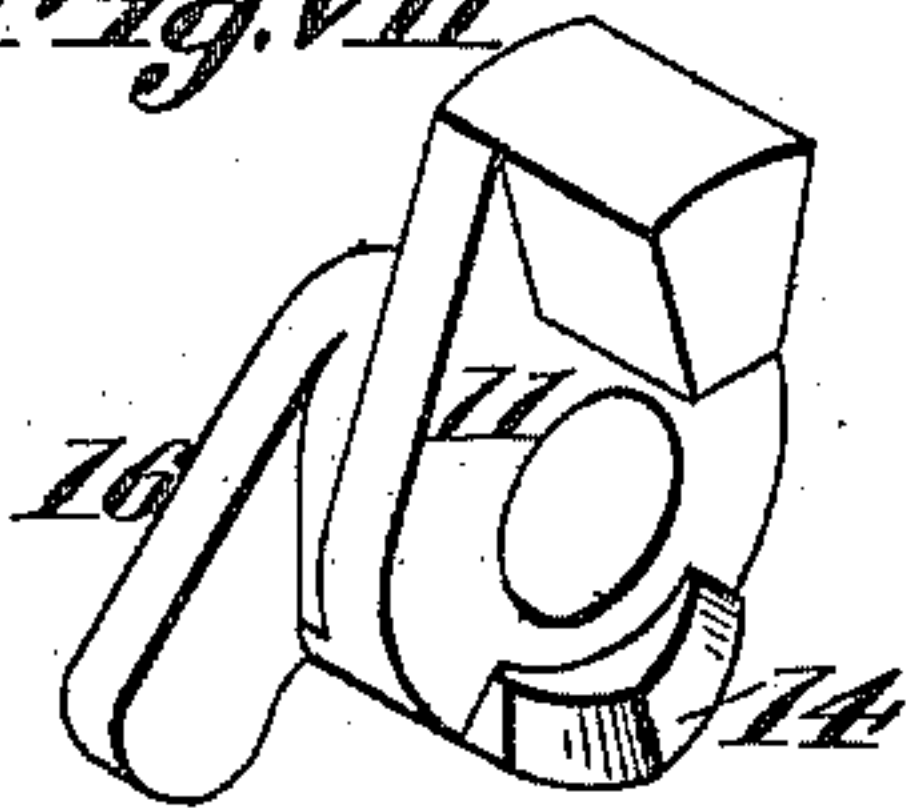


Fig. V.

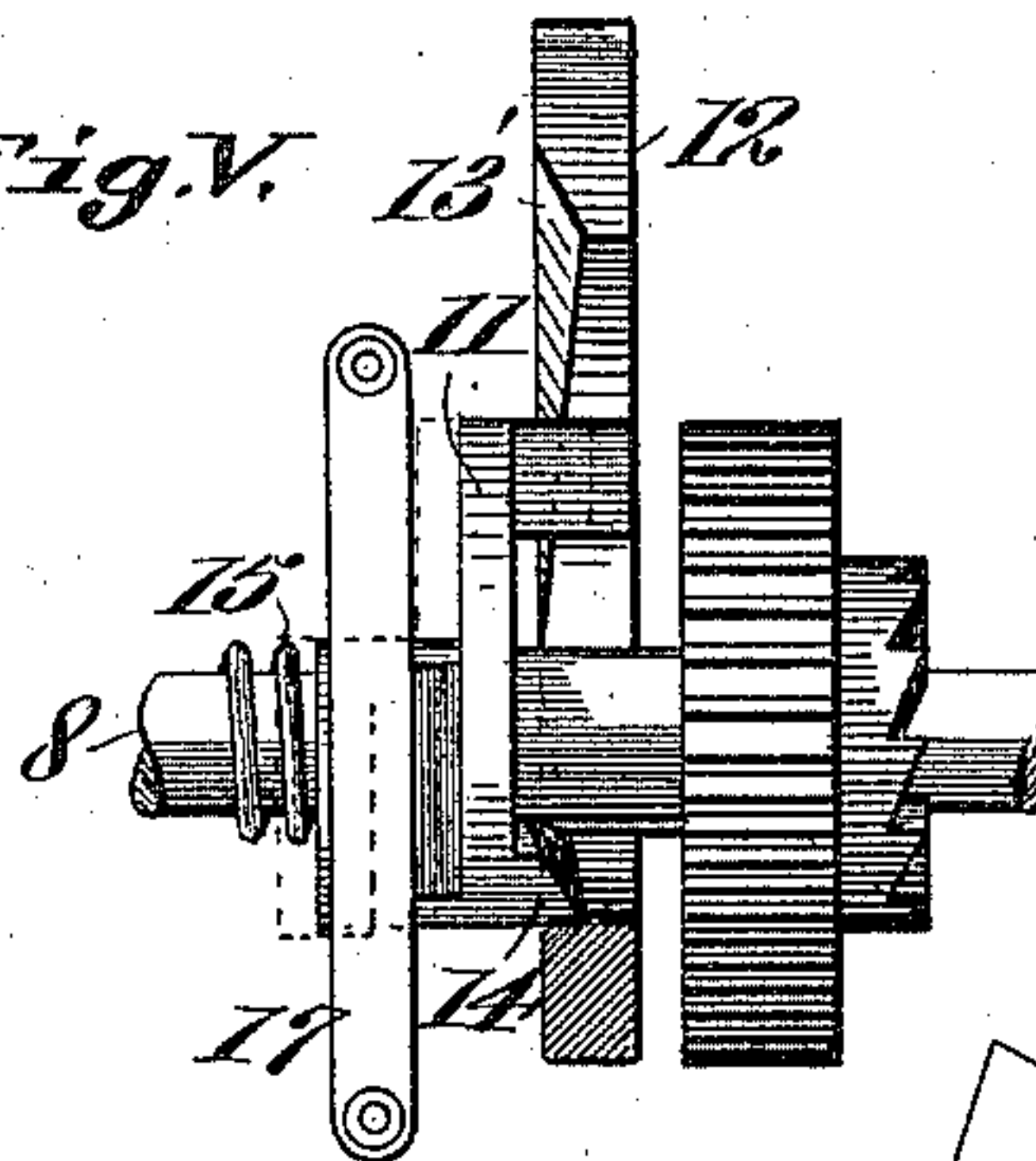


Fig. VI.

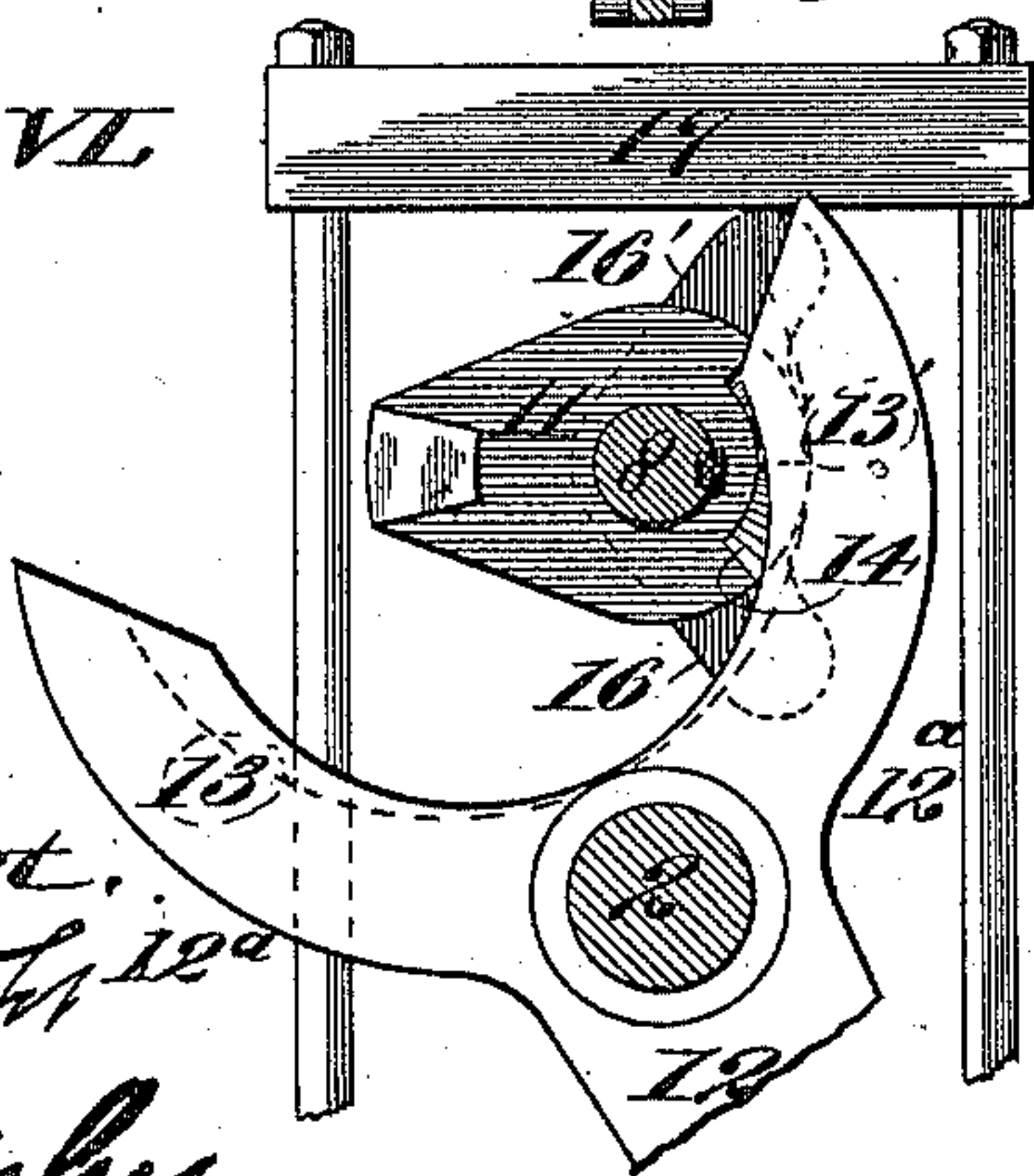
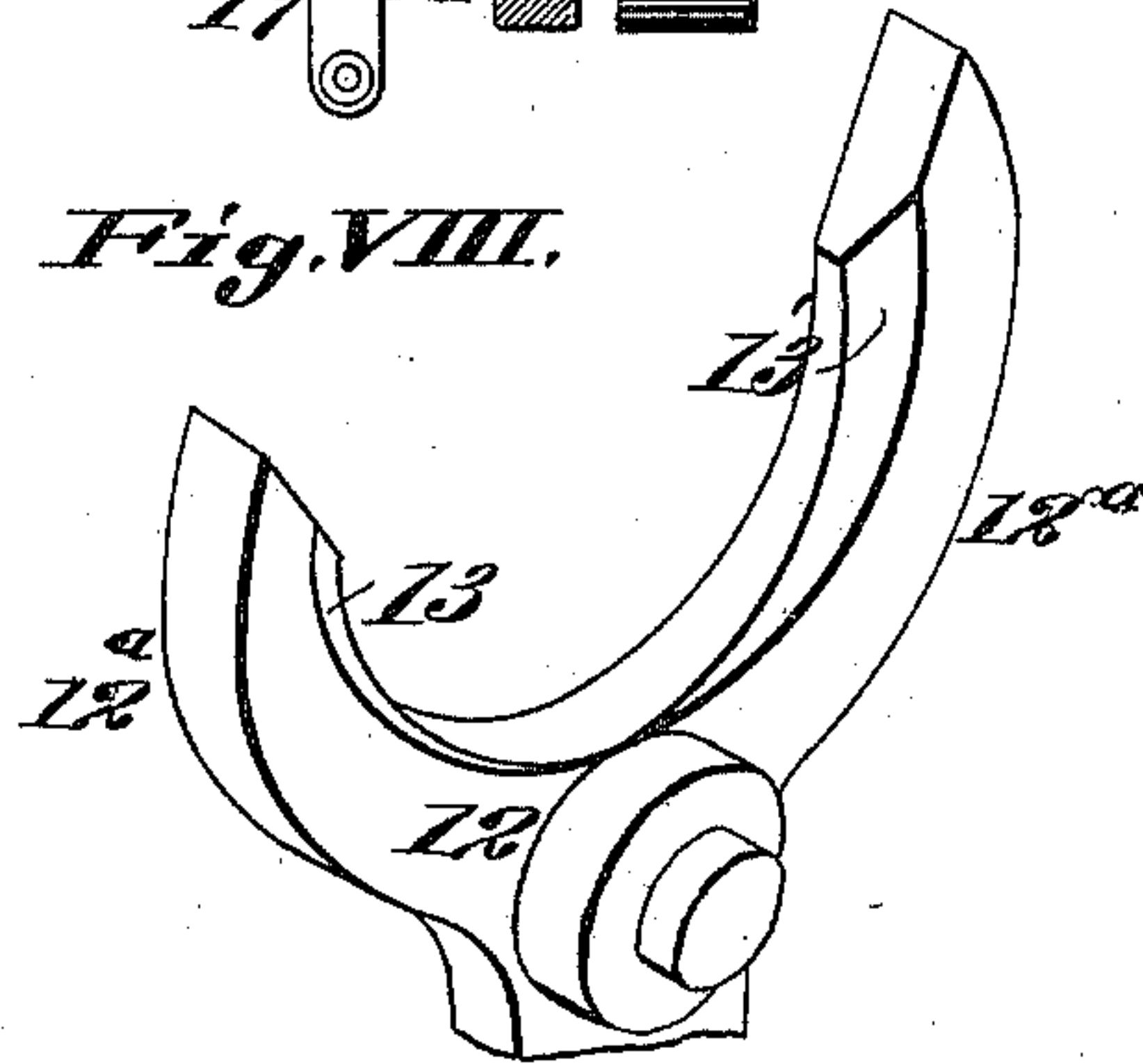


Fig. VIII.



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# UNITED STATES PATENT OFFICE.

THOMAS HILL, OF QUINCY, ILLINOIS, ASSIGNOR TO THE SMITH-HILL  
ELEVATOR COMPANY, OF SAME PLACE.

## LIMITATION-STOP FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 581,958, dated May 4, 1897.

Application filed December 11, 1896. Serial No. 615,385. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS HILL, a citizen of the United States, residing at Quincy, county of Adams, State of Illinois, have invented a certain new and useful Improvement in Limitation-Stops for Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My present invention relates to that class of limitation-stops set forth in Patent No. 563,036, granted June 30, 1896, to my assignee, the Smith-Hill Elevator Company.

This invention has for its object to furnish a positive, independent, adjustable limitation-stop for elevators, so arranged as to operate independently of the operating-brake and to bring the cage to a gradual stop in either direction without jerk or jar.

My present invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a side elevation illustrative of my invention. Fig. II is a side elevation, part in section, on line II II, Fig. III. Fig. III is a top view of the mechanism shown in Fig. II. Fig. IV is a side elevation illustrating the limitation-brake operator. Fig. V is a detail side view of the cam-and-yoke device used in operating the limitation-brake. Fig. VI is a detail front view of said cam-and-yoke device. Fig. VII is a detail perspective view of the cam. Fig. VIII is a detail perspective view of the yoke.

1 is the hoisting-drum. 2 is the shaft of said drum, provided with a threaded extension 3, to which are secured the adjustable stops 4 and 5.

6 is an elongated pinion which meshes with a cog-wheel 7, rigidly mounted on the counter-shaft 8, journaled in a bracket or frame 9.

10 is a weight secured to the outer end of the counter-shaft 8, and 11 is a longitudinally-traveling cam riding on the inner end of the shaft.

Loosely mounted on the shaft 2 is a fork or yoke 12, having curved arms 12<sup>a</sup>, that straddle the counter-shaft 8. The parts above referred to are to be found in the patent mentioned. The inner faces of the arms are provided with beveled inclines 13 and 13', on

which a projection 14 on the cam 11 is adapted to ride.

15 is a coil-spring placed around the counter-shaft 8 for the purpose of keeping the cam 11, which, as stated, can ride back and forth on the counter-shaft, pressed against the yoke 12. The cam 11 is provided with wings 16 16', which, with the partial revolution of the counter-shaft 8, ride against a bar 17, which raises and lowers rod 18, which rod is pivoted to a lever 19. The lever 19 (see Figs. I and II) is fulcrumed at 20 to a stationary frame 21 and is connected at 22 and 23 to the links 24 and 25. The other ends of the links are attached to the movable ends of two brake-shoes 26 and 27, which are respectively hung at 28 and 29 to a block 30, which is adjustably supported in a standard 32 by bolts 31, fitting in slots in the block. (See Fig. II.) This manner of mounting the brake-shoes provides for a uniform pressure of them upon the brake-wheel, for by bringing the shoes up tight against the wheel before the bolts 31 are tightened the block 30 will be moved to its proper location, and then by tightening the bolts the block will be held in a position that will insure a uniform bearing of the brake-shoes upon the wheel.

33 is a brake-wheel secured to the motor-shaft 34, and against which the brake-shoes 26 and 27 are adapted to press.

35 is a quadrant adapted to move in an arc whose center is at the pivot 36. It is moved backward or forward by a rod 37, pivoted thereto at 38, and whose other end is attached to the yoke 12 at 39. The lower end of the yoke 12 is swung backward or forward by a rod 40, controlled by the operator in the cage.

41 is a movable switch swinging to the right or left with the movement of the quadrant 35. As it swings one way or the other it comes in contact with the brushes 42 and 43 or 42' and 43', turning an electric current onto the elevator-motor for the purpose of either raising or lowering the cage. This movement of the quadrant controls another pair of brake-shoes 44 and 45, which are hung and operate in a manner similar to the pair already described. The links 46 and 47, which are connected to the movable ends of said brake-shoes 44 and 45, are connected to a lever 48, pivoted to the stationary frame 21



at 48'. The outer end of lever 48 is connected by a link 49 and a pin 50 to the quadrant 35. As this quadrant moves to the right or left, from a central position, the link 49 will pull  
 5 down on the lever 48, which in turn will spread the shoes 44 and 45. This will release the motor, allowing the cage to ascend or descend.

Fig. I shows the normal position of the  
 10 parts, the brakes being applied and the contact 41 in position to prevent the electric current from passing through the brushes 42 43 or 42' 43'. The lever 48 is made in two parts, one telescoping the other, (see Fig. II,) so that  
 15 the outer part can turn slightly as the quadrant rocks back and forth.

The operation is as follows: When the pinion 6 reaches one of the stops 4 or 5 and turns the shaft 8 and cam 11, as in the patent referred to, one of the wings 16 (according to whether the cage is ascending or descending) comes against the cross-piece 17 and by lifting the outer end of the lever 19 applies the  
 20 brake-shoes 26 and 27 and stops the movement of the cage. The operator is supposed at this time to throw off the current by moving the quadrant 35, but should he fail to do so the cam 11 coming against the yoke 12 will do so, as the lower extension of the yoke is  
 25 connected to the quadrant by the rod 37, and this movement of the quadrant by the yoke will apply the brake-shoes 44 and 45. As the operator moves the quadrant, and consequently the yoke connected thereto, in the reverse direction to cause the elevator-cage to  
 30 ascend or descend, as the case may be, the brake-straps 26 27 are released by the inclined face 13 or 13', as the case may be, coming against the cam projection 14 on the cam 11 and moving the cam toward spring 15, thus  
 35 forcing the wing 16 that is in engagement with the cross-piece 17 out from under the cross-piece, the spring 15 yielding to this movement of the cam 11, and thus the brake-straps 26  
 40 27 are released. When the cage is stopped at floors between the top and bottom of the elevator-shaft, the brake 44 45 alone is employed, this brake being applied each time the operator moves the quadrant to its vertical  
 45 position. (Shown in Fig. I.)

I claim as my invention—

1. In a stop for elevators, the combination of a hoisting-drum shaft having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end  
 55 movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted  
 60 on the counter-shaft, a cross-piece adapted to be engaged by wings on said cam, a brake-wheel, straps adapted to be applied to said wheel, and a connection between said straps and said cross-piece, substantially as set forth.

65 2. In a stop for elevators, the combination of a hoisting-drum shaft having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end

tension of the shaft, stops for limiting the end movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon  
 70 which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a cross-piece adapted to be engaged by wings on said cam, and a brake device to which said cross-piece is connected,  
 75 substantially as set forth.

3. In a stop for elevators, the combination of a hoisting-drum shaft having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end  
 80 movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a cross-piece adapted to  
 85 be engaged by wings on said cam, a lever connected to said cross-piece, a brake-wheel, and straps adapted to be applied to said wheel, and which are connected to said lever, substantially as set forth.

4. In a stop for elevators, the combination of a hoisting-drum having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end  
 90 movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a cross-piece adapted to be engaged by wings on said cam, a yoke provided with beveled faces adapted to bear  
 95 against a cam projection on said cam, and a brake device to which said cross-piece is connected, substantially as set forth.

5. In a stop for elevators, the combination of a hoisting-drum shaft having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end  
 100 movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a cross-piece adapted to be engaged by wings on said cam, a yoke adapted to be moved by said cam and which  
 105 is provided with beveled faces adapted to bear against a cam projection on said cam, and a brake device to which said cross-piece is connected, substantially as set forth.

6. In a stop for elevators, the combination of a hoisting-drum shaft having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end  
 110 movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a yoke adapted to be moved by said cam, a quadrant to which said yoke is connected and which is adapted to  
 115 move the switch of the motor, and a brake device connected to said quadrant, substantially as set forth.

7. In a stop for elevators, the combination



of a hoisting-drum shaft having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a yoke adapted to be moved by said cam, a quadrant to which said yoke is connected and which is adapted to move the switch of the motor, a brake-wheel, straps adapted to be applied to said wheel, and a connection between said straps and quadrant, substantially as set forth.

8. In a stop for elevators, the combination of a hoisting-drum shaft having a threaded extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a cross-piece adapted to be engaged by wings on said cam, a brake device to which said cross-piece is connected, a yoke adapted to be moved by said cam, a quadrant to which said yoke is connected and which is adapted to move the switch of the motor, and a brake device connected to said quadrant, substantially as set forth.

9. In a stop for elevators, the combination of a hoisting-drum shaft having a threaded

extension, a pinion fitting on the threaded extension of the shaft, stops for limiting the end movement of said pinion, a gear-wheel meshing into said pinion, a counter-shaft upon which the gear-wheel is mounted, a weight mounted on the counter-shaft, a cam mounted on the counter-shaft, a cross-piece adapted to be engaged by wings on said cam, a brake device to which said cross-piece is connected, a yoke adapted to be moved by said cam, and a second brake device connected to said yoke, substantially as set forth.

10. In a stop for elevators, a brake device adapted to be operated from the cage of the elevator, in connection with a second brake device adapted to be automatically operated through mechanism moved by the hoisting apparatus, and mechanism whereby said first-mentioned brake device is released automatically by the mechanism that moves said second brake device, substantially as set forth.

11. In a stop for elevators, the combination of a brake-wheel, a pair of brake-straps, a block to which the straps are secured at one end, and a supporting-standard with which said block has vertical slot-and-bolt connection, substantially as set forth.

THOMAS HILL.

In presence of—

E. A. HENDERSON,  
C. W. TAHLAND.