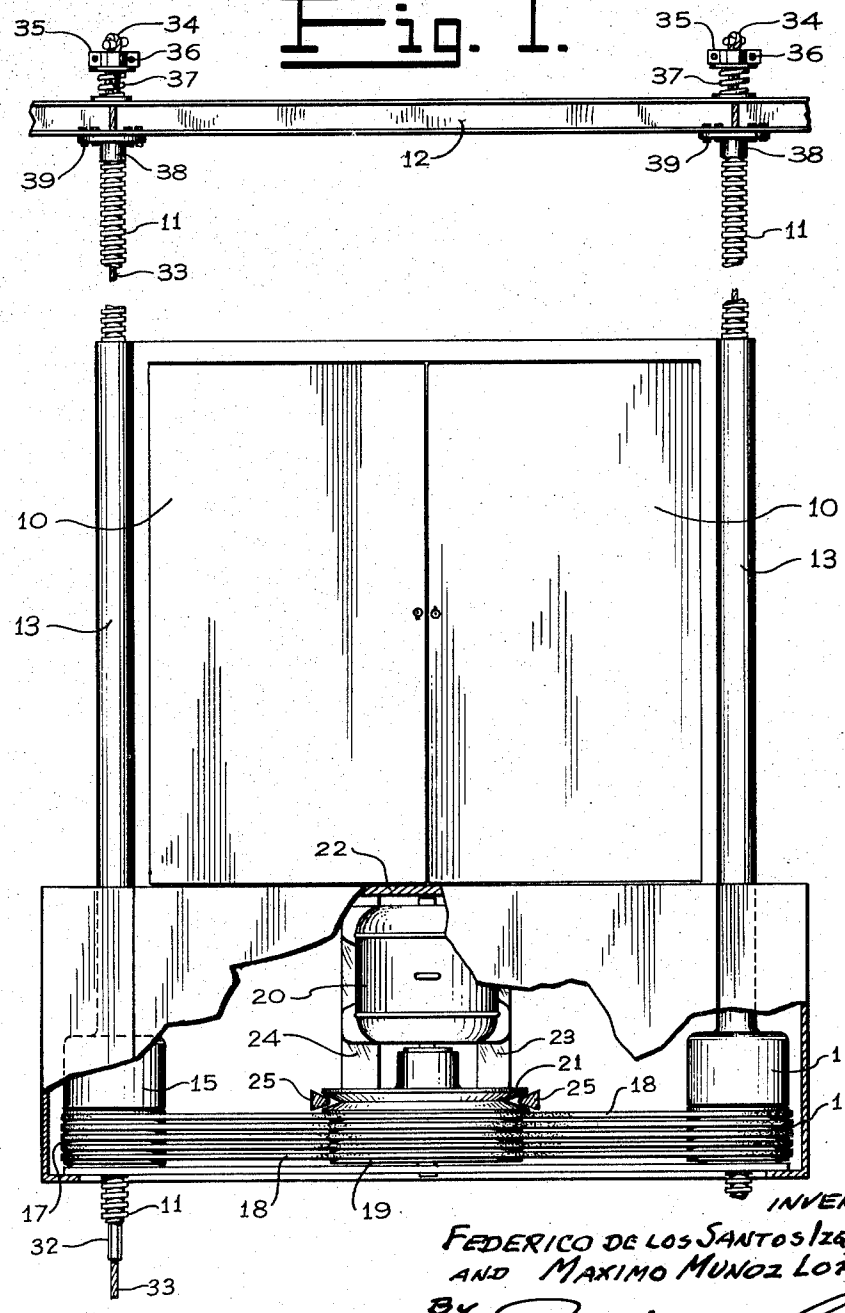
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Fig. 1.



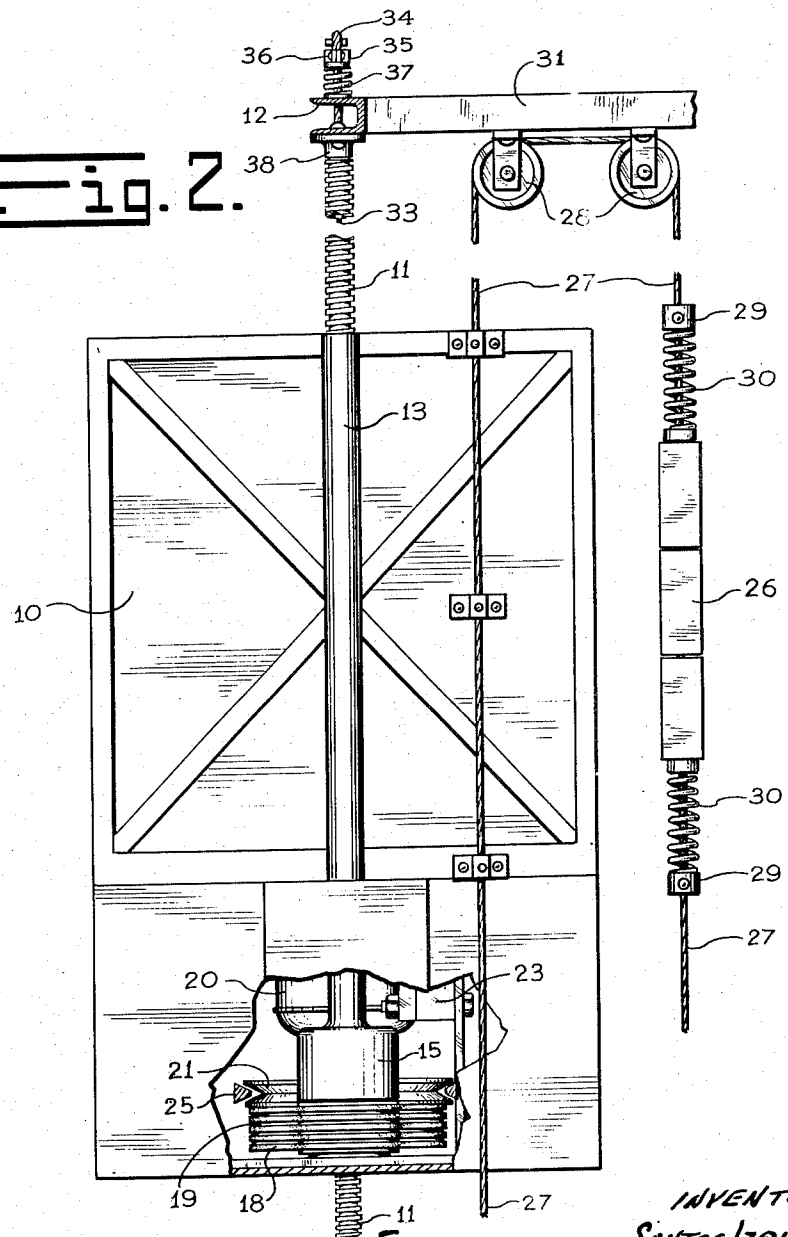
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Fig. 2.



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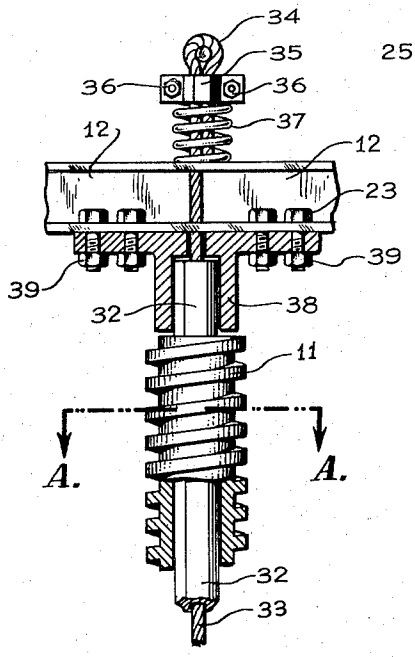


Fig. 4.

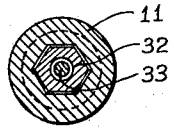


Fig. 5.

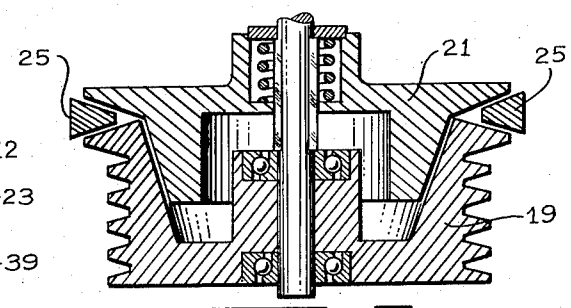
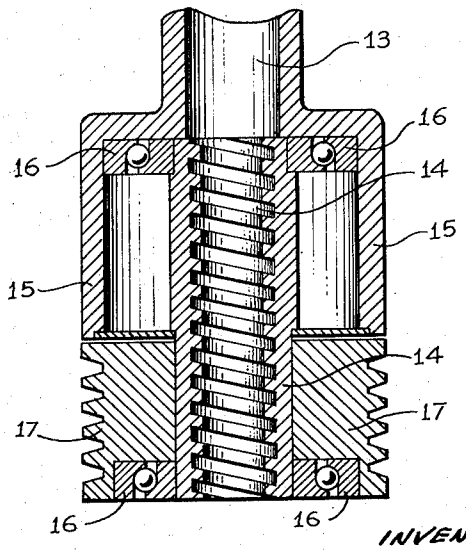


Fig. 3.

Fig. 6.



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3 Claims. (Cl. 187—25)

The present invention relates, in general, to elevators and hoists and, more particularly, refers to certain useful improvements in apparatus and installations of this kind, which provide a completely novel and original driving system or transmission of movement, which offers great advantages over all those heretofore used and known.

The drive system, or system for the transmission of movement, for the elevators and hoists of our invention, is characterized substantially in that the cables, pulleys, and hoists which, together with the motor, draw the elevator, are substituted with two fixed screws and two rotating nuts mounted on the elevator cab, which nuts rotate along the two screws by means of the drive from a motor which likewise is mounted directly on said elevator cab or box. By means of the rotating movement of the nuts, the elevator goes up and down along the screws.

Among the advantages offered by this new elevator system, the following may be mentioned:

It is the only elevator whose source of power and movement is situated directly in its cab or box. Therefore it is the only one provided with autonomous or independent movement, in contrast with those used and known heretofore, which have their motor or source of power installed in the upper or lower part of the building and therefore independently of the elevator proper.

Its general structure and component parts are much simpler since it amounts, essentially, to two screws with their nuts and a motor to drive the latter.

It is safer inasmuch as its operation does not depend exclusively on the cable, for drawing and supporting the elevator, as is the case with the elevators used heretofore.

In the present elevator, of the invention, it is impossible for the threads of the screws to become worn or break along the length of said screws, which is the only possible cause of a fall or accident.

The installation is easier and more economical since it simply amounts to two vertical screws which serve as a guide for the entire system.

A greater output is obtained in the present elevator since there are fewer masses to place in movement and less friction and, consequently, a reduced loss of power through friction.

A greater speed can be obtained, along with more safety and a higher output, as indicated above.

These and other advantages, details, features, and differences with regard to known apparatus, will be made clearly evident in the course of the following description, as also in the drawings attached hereto in illustration thereof, the same reference numbers being used in said drawings to indicate the same parts in the six figures shown.

In said drawings:

Fig. 1 is an elevational view of the front of an elevator like that of the invention, partly broken at its lower portion to show its drive or system for transmitting movement.

Fig. 2 is likewise a view in side elevation of the same elevator shown in the preceding figure.

Fig. 3 shows a detail in vertical section of the clutch for the system.

Fig. 4 shows, in elevation, a detail of the screw and its attachment to the beams.

Fig. 5 shows a transverse section of the screw along line A—A of Fig. 4; and

Fig. 6 illustrates an elevation in vertical section of the nut with its ball bearings and cages.

Before describing in detail the new drive, or system of transmission of movement, to elevators or hoists, according to our invention, and as it is shown in the attached drawings, it should be clearly understood that said drawings illustrate only by way of example one of preferred forms of practicing the invention, but without limiting the latter to the specific details illustrated and described. Therefore it should be understood that the invention covers any type or model of elevator, for persons or for freight, to which the present system can be applied, or in other words: two or more rotating nuts which rotate on two or more screws, by means of a motor installed in the cage or cab proper of the elevator; all, of course, without deviating from the principles of the invention and within the scope of the claims given at the end of this description.

As illustrated enunciatively in the attached drawings and particularly in Fig. 1 thereof, on either side of the elevator cab **10** there is a screw **11**, each of said screws being fixed in a vertical position and in parallelism, although they can also operate in a more or less inclined position. Said screws **11** are secured, at their two ends, to two beams or cross members **12**, situated at the upper and lower parts (not illustrated) of the building or industrial installation. Said screws **11** are preferably two in number, as seen in said Fig. 1, and are secured in parallel relation at a suitable distance so that the cage or cab **10** of the elevator may operate and slide between them.

Said screws **11** act also as guides for cab **10** since the latter provides two tubular parts **13** which embrace screws **11** like a sleeve and slide along their entire length.

It is the nuts **14** (Fig. 6, in detail) which effect the movement of translation from above to below and vice versa, since they slide along screws **11** due to the rotation of said nuts. For attachment and safety purposes, said nuts **14** are mounted in cages **15** on ball bearings **16**, having a radial and axial action (Fig. 6 of the drawings), for the purpose of reducing the friction and, consequently, the wear, to a minimum. For the rotational movement of each of said nuts **14**, they carry, firmly attached thereto, a sheave **17** for the band V which in turn is driven by bands **18** (Figs. 1 and 2), pulley **19**, and motor **20**, situated beneath the cab **10** of the elevator, as seen in Fig. 1 of the drawings.

The drive or transmission from motor **20** to pulley **19**, secured to the shaft thereof, is effected by means of a friction clutch **21** (Fig. 3) and, as indicated previously, the motor and the drive mechanism are mounted and secured beneath the floor **22** of the elevator, where they are secured by means of structures **23** and **24**. For the operation of said clutch **21**, there are provided wedges **25**, actuated in the usual manner.

For the purpose of leveling the load and reducing the strain on the motor **20**, the cab **10** of the elevator has a counterweight device **26** (Fig. 2), secured to the cables **27** and pulleys **28**, by means of intervening collars **29** and springs **30**. The pulleys **28** are secured to beams **31**.

Fig. 4 of the attached drawings shows in detail screw **11** which is mounted in sections on the polygonal tube **32**, so that the sections remain fixed and do not turn. Through said polygonal tube **32** passes longitudinally

cable **33** which crosses beam **12** and is fastened with a tie **34**, clamp **35** and studs **36**. Between the tie or loop **34** and beam **12** there is a spring **37** which forces cable **33** to be completely under tension, absorbing effects of dilation due to temperature changes and regulating said tension.

Finally the mouth piece **38** fixes the position of the polygonal tube **32** (Fig. 4 of the drawings) and is secured to beam **12** by means of threaded bolts and nuts **39**.

Fig. 5 of the drawings illustrates screw **11** in transverse section, showing very clearly the arrangements of its parts, namely: cable **33** at the center; polygonal tube **32** through which said cable passes; and, to the outside, after the manner of a sleeve or cover, screw **11** along which rotates nut **14** which is driven by elevator **10** by means of the power of motor **20** and pulleys **19** and **17**.

We claim:

1. An elevator structure comprising a cage, a plurality of non-rotatable screws fixed at the opposite sides of the cage and disposed along the entire length of the path of movement of the cage, a tubular member attached to each side of the cage through which passes a corresponding screw to serve as guides for the cage, a nut rotatably mounted on each screw, a motor supported beneath the cage, means for transmitting motion from said motor to said nuts, a supporting beam for the elevator structure, a polygonal-shaped tube attached to the beam at each side of the cage, and a cable passing through each tube and attached to the beam, each screw comprising a plurality of sections mounted non-rotatably on its corresponding tube.

2. An elevator structure as set forth in claim 1, wherein the means for attaching the polygonal tube to the beam comprises a member secured to the beam and having a polygonal-shaped opening receiving the end of the tube to hold the tube in fixed and non-rotatable position.

3. An elevator structure as set forth in claim 1, wherein each tubular cage guiding member is provided with a housing to receive the rotatable nut.

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