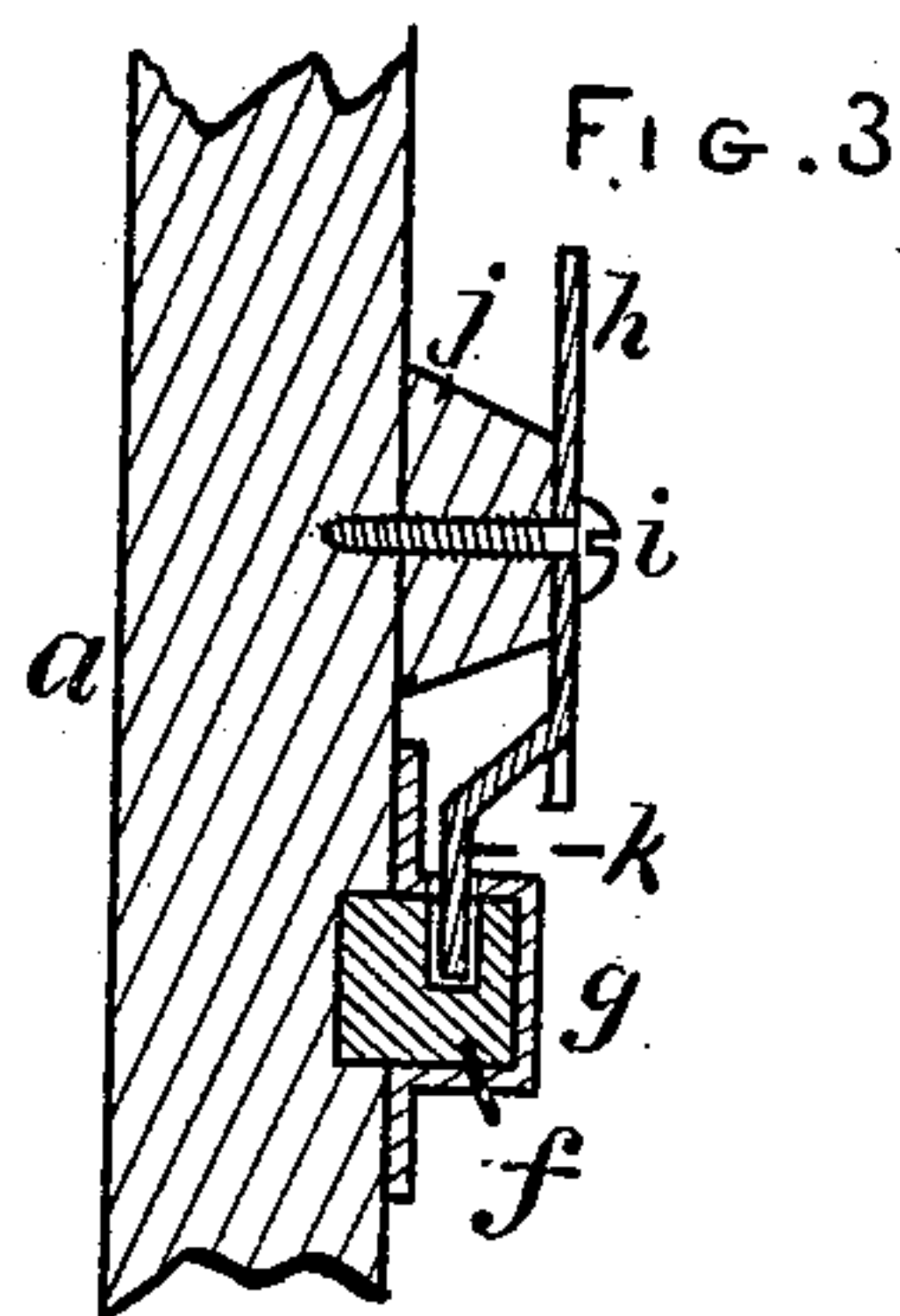
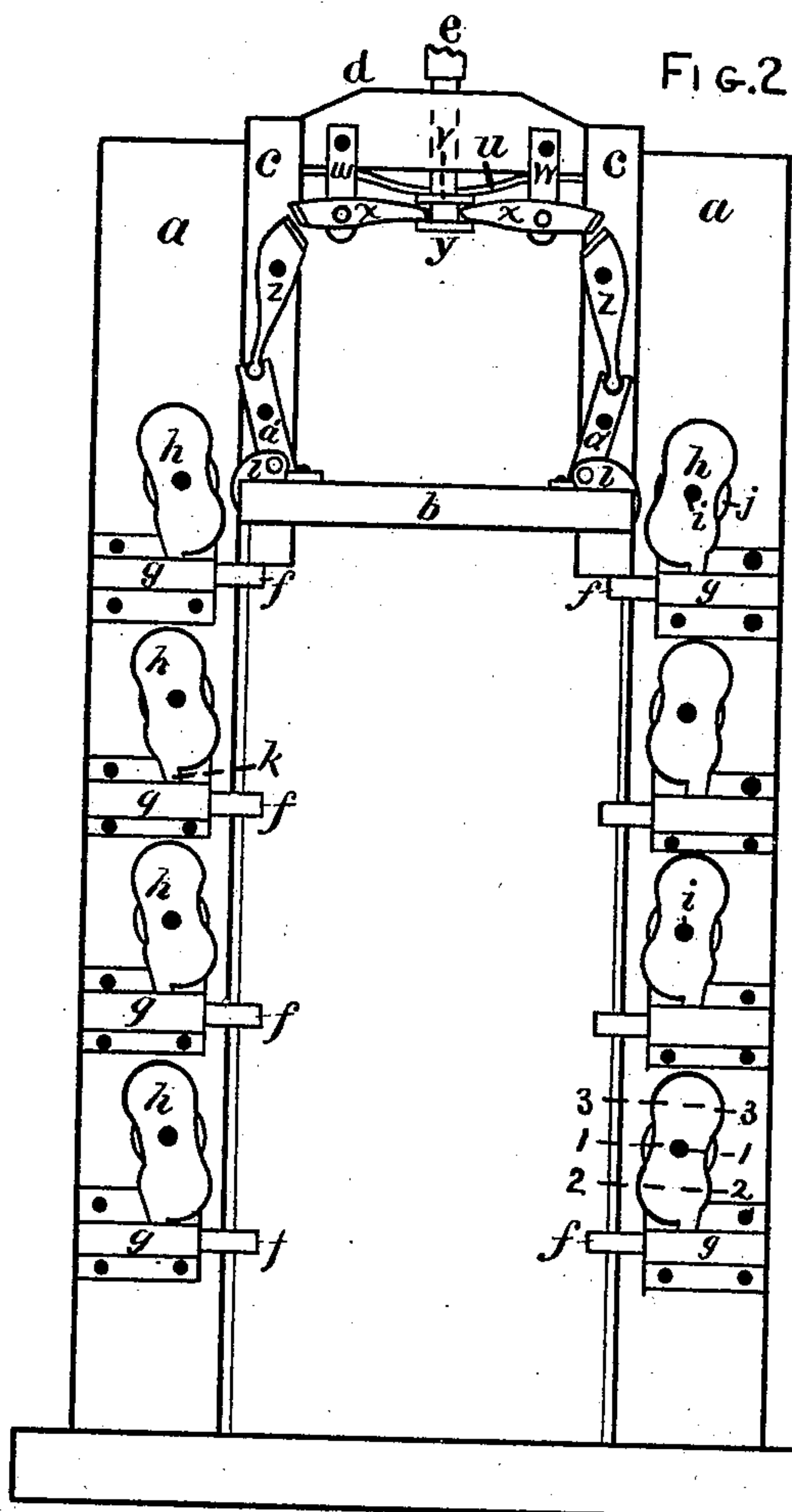
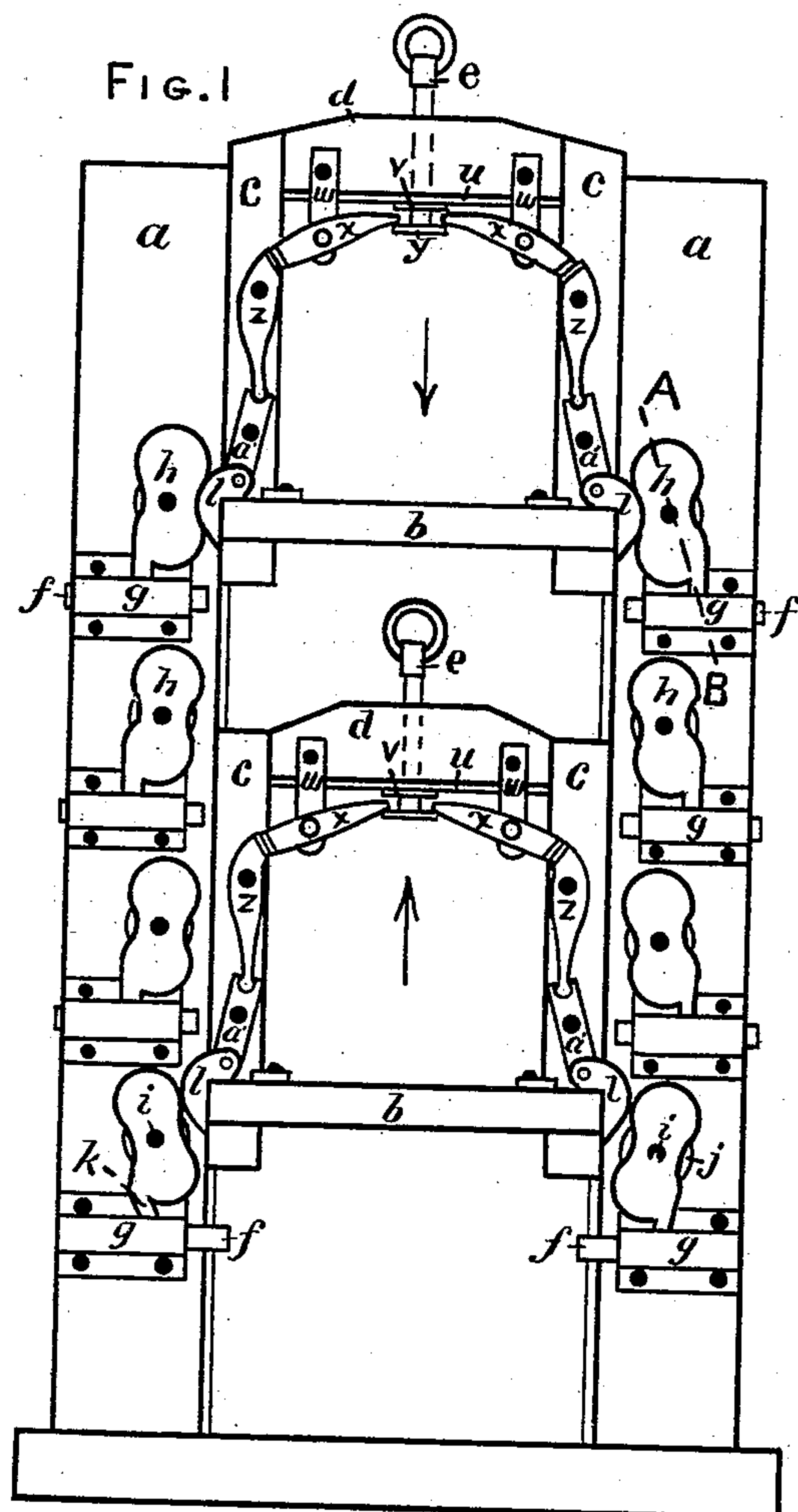


(Model.)

H. M. LEE.
Passenger-Elevator.

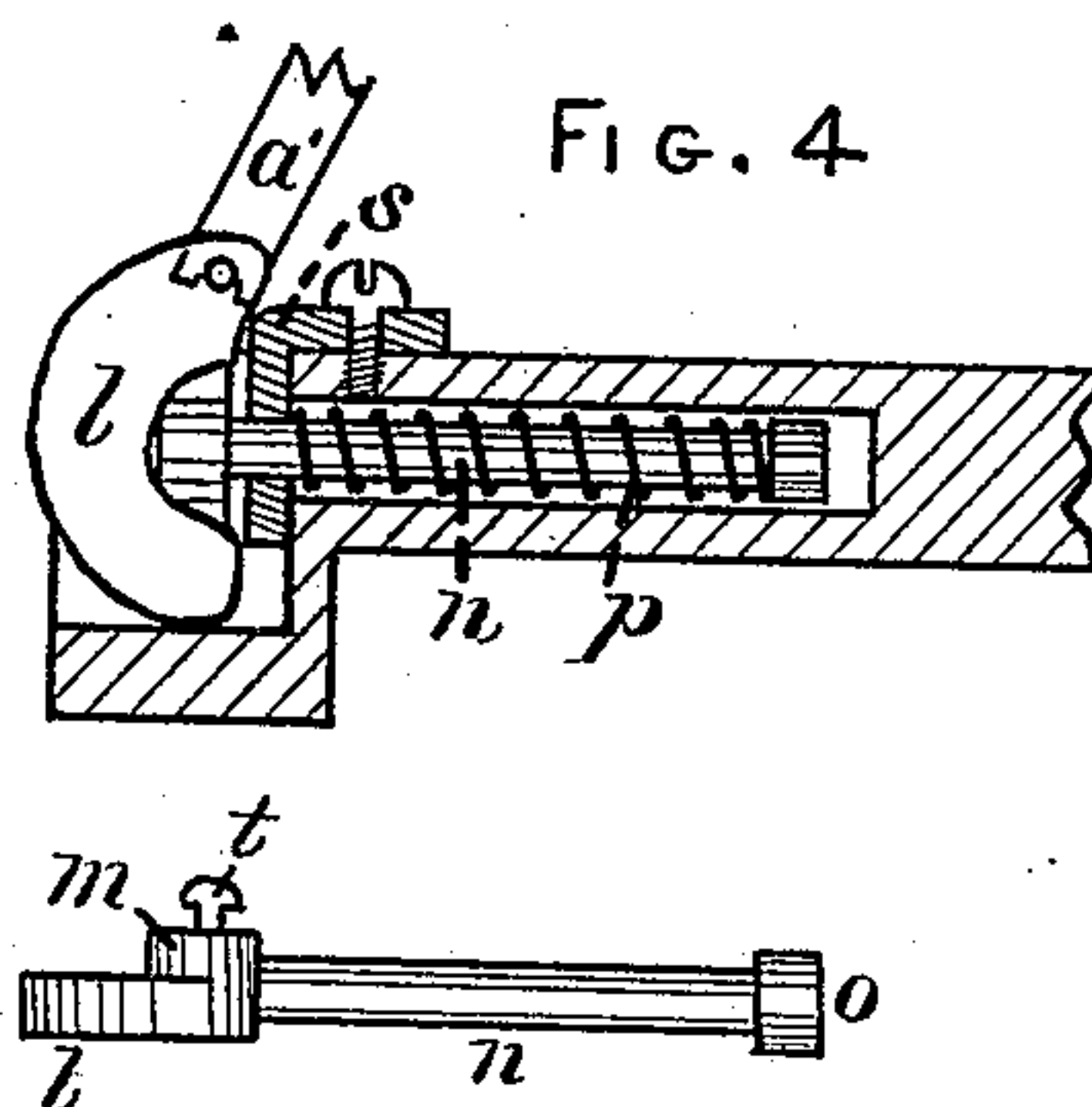
No. 226,330.

Patented April 6, 1880.



WITNESSES,

John T. Whitman
Herbert T. Whitman



INVENTOR,

Horace M. Lee
per Eugene Humphrey
attys.

UNITED STATES PATENT OFFICE.

HORACE M. LEE, OF BOSTON, MASSACHUSETTS.

PASSENGER-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 226,330, dated April 6, 1880.

Application filed March 4, 1880. (Model.)

To all whom it may concern:

Be it known that I, HORACE M. LEE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful or
5 Improved Passenger-Elevator, which invention is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention relates to that class of elevators which are employed to raise or lower passengers and merchandise, and which are operated by a rope or ropes attached to the cross-beam thereof; and the invention consists in a series of sliding safety-bars secured in proper
15 supports upon opposite sides of the elevator-well and connected with cam-levers, which, when actuated, will withdraw or extend such bars, such levers being so arranged as to be actuated by a cam arranged on each side of
20 the elevator-platform, and so connected with pivotal levers which engage the draft-rod that when the elevator-car rises such safety-bars will, by the action of said cams and cam-levers, be successively extended into its path as it
25 passes them, and when the car is lowered by the suspending-rope such bars will be successively withdrawn in advance from the path of the car, the safety-bars, cam-levers, and pivotal levers being so connected with the draft-
30 rod that in case of the breaking of the rope such safety-bars would not be withdrawn by the action of the cams as the car descended, and hence it would be arrested and sustained by the bars next below the point of its loca-
35 tion at the time of breaking such rope.

Figure 1 is a front elevation, showing my invention, in which, for purposes of illustration, are shown two cars, the lower one being represented as ascending, and as having just passed
40 the lower safety-bars, which are shown as projected into the path of the car, the upper car being shown as descending and as in the act of throwing back the upper or first bars. Fig. 2 is an elevation similar to Fig. 1, but showing only
45 one car, and that at the top, and as broken loose from the rope and resting upon the upper safety-bars, all such bars in this figure being shown as extended by the car in the act of rising. Fig. 3 is a detached vertical section as taken on line A B, Fig. 1, through the
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pivotal center of one of the cam-levers and transversely to the safety-bar and its casing, the side support or upright being shown in vertical section. Fig. 4 is a detached vertical section of a portion of the platform of the car, 55 and showing the cam, its spindle, and actuating-spring all in elevation, the holding-bracket being shown in vertical section.

In said figures, *a a* represent the vertical side supports, which may be of wood or iron, 60 and constructed and arranged as desired. The platform of the car is shown at *b*, the side uprights thereof at *c c*, and the overhead beam at *d*; and *e* is the draft or rope bolt, which is secured in beam *d*. The car is laterally sup- 65 ported by and slides upon suitable ways or guides secured to supports *a a*.

The safety-bars *f* are seated in the casings *g*, which are secured to supports *a*, as shown. The cam-levers *h* are pivoted at *i* to the pro- 70 jections *j*, which are secured to and project sufficiently from supports *a* to insure the contact of the cams on the car with such levers. A projecting point or finger, *k*, of these levers enters a hole or recess in bars *f*, as shown in 75 Fig. 3, so that when the lever is vibrated on its pivot *i* it will slide the bar to the extent of its own vibration, a slot being cut in casing *g* to allow free movement of the lever.

The cams *l l* are formed, as shown in Fig. 4, 80 with a boss or hub, *m*, in which is secured the spindle *n*, having a head, *o*, at its inner extremity. On this spindle is mounted the coiled spring *p*, which exerts its force between such head and the bracket *s*, secured in platform *d*, 85 and which serves as a support for the spindle and its cam. The office and effect of spring *p* is to retract or draw cam *l* within its seat or recess in platform *d*, as shown in Fig. 4, when not controlled by the pivotal levers, next to be 90 described.

A semi-elliptic spring, *u*, is secured beneath beam *d*, as shown in Fig. 2, and its center acts against collar *v* of bolt *e*, thereby tending to force said bolt downward, as shown in Fig. 2, 95 in case it was disengaged from the rope. The stirrups *w w*, secured to beam *d*, serve as the supports on which are pivoted the levers *x x*, the inner ends whereof are seated between collars *v* and *y* on bolt *e*, so that as said bolt 100

is raised or lowered relatively to beam *d* said levers will be vibrated upon their pivots in stirrup *w*.

Two levers, *z z*, are respectively pivoted upon uprights *c c*, as shown, their upper ends being formed and arranged to be engaged by the outer ends of levers *x*, while their lower ends are seated in or secured to the upper ends of levers *a' a'*, also pivoted to uprights *c*, the lower ends of levers *a'* being connected with cams *l* by the pin *t*, as shown in Fig. 4.

The practical operation of my invention is as follows: When the car is suspended by its rope attached to bolt *e*, the spring *u* is forced against bar *d* (see Fig. 1) by the contact of collar *v*, as the bolt rises in the beam before the car follows such movement, and the inner ends of levers *x*, seated between collars *v* and *y*, are thereby raised, while their outer ends are correspondingly depressed, and by their contact with levers *z* forcing their upper ends outward and their lower ends inward, carrying with them the upper ends of levers *a'*, which would throw their lower ends outward, thereby extending cams *l*, so that as the car passed up and down they would actuate the cam-levers *h*, in manner next to be described. Said levers are formed with a compound curved outline, concave at transverse line 1 and convex at lines 2 and 3, as shown, so that when cams *l* are, by the rising of the car, brought in contact with part 3 of the levers, bars *f* would be thereby forced outward, as shown, by the lower pair in Fig. 1, and by all said bars in Fig. 2. Thus, as the car rises and passes the levers, each pair of bars is forced within the path of the car, so that if the rope should suddenly break the car could only fall the distance equal to that from one pair of bars to those next below. When the car descends the cams *l*, by their contact with part 2 of levers *h*, will thereby force back the bars *f*, as shown by the three upper pairs in Fig. 1, such bars so remaining until the rising of the car shall force them out, as shown by said lower pair in Fig.

1. When the car is at the top of the well all said bars will be in the position shown in Fig. 2, and should the rope then be severed cam *l*, being released from the action of the levers connected with bolt *e*, would be retracted by springs *p*, and hence would not engage levers *h*, and would not force bars *f* back out of the path of the car, which would be arrested by said bars, as shown in Fig. 2.

It will be obvious that said safety-bars may be actuated by a variety of devices, and that the device that actuates them may be arranged to be operative only when so held or controlled by the operator as to throw back such bars, and that when not so thrown back when passing they may be forced forward by suitable self-acting springs or other devices; and the bars *f* and cam-levers *h* may be actuated by a great variety of devices attached to and moving with the car.

I claim as my invention—

1. As an improvement in elevators, a series of horizontal bars, *f*, mounted to slide laterally in suitable supports at the sides of the pathway of the car, and provided with automatic devices, whereby said bars will be successively forced within the pathway of the car as it rises above them, substantially as specified.

2. As an improvement in elevators, the horizontal bars *f*, mounted to slide laterally in suitable supports at the sides of the pathway of the car, the cam-levers *h*, connected with such bars, and suitable devices attached to said car to engage the said levers, whereby as the car is raised or lowered it shall actuate said bars through such cam-levers, substantially as specified.

3. As an improvement in elevators, the combination of bars *f*, cam-levers *h*, cams *l*, and levers *x z a'*, all substantially as specified.

HORACE M. LEE.

Witnesses:

T. W. PORTER,
M. M. UPHAM.