

(No Model.)

2 Sheets—Sheet 1.

W. F. HANSON & W. F. BULLOCK.

AUTOMATIC STOP FOR ELEVATORS.

No. 375,745.

Patented Jan. 3, 1888.

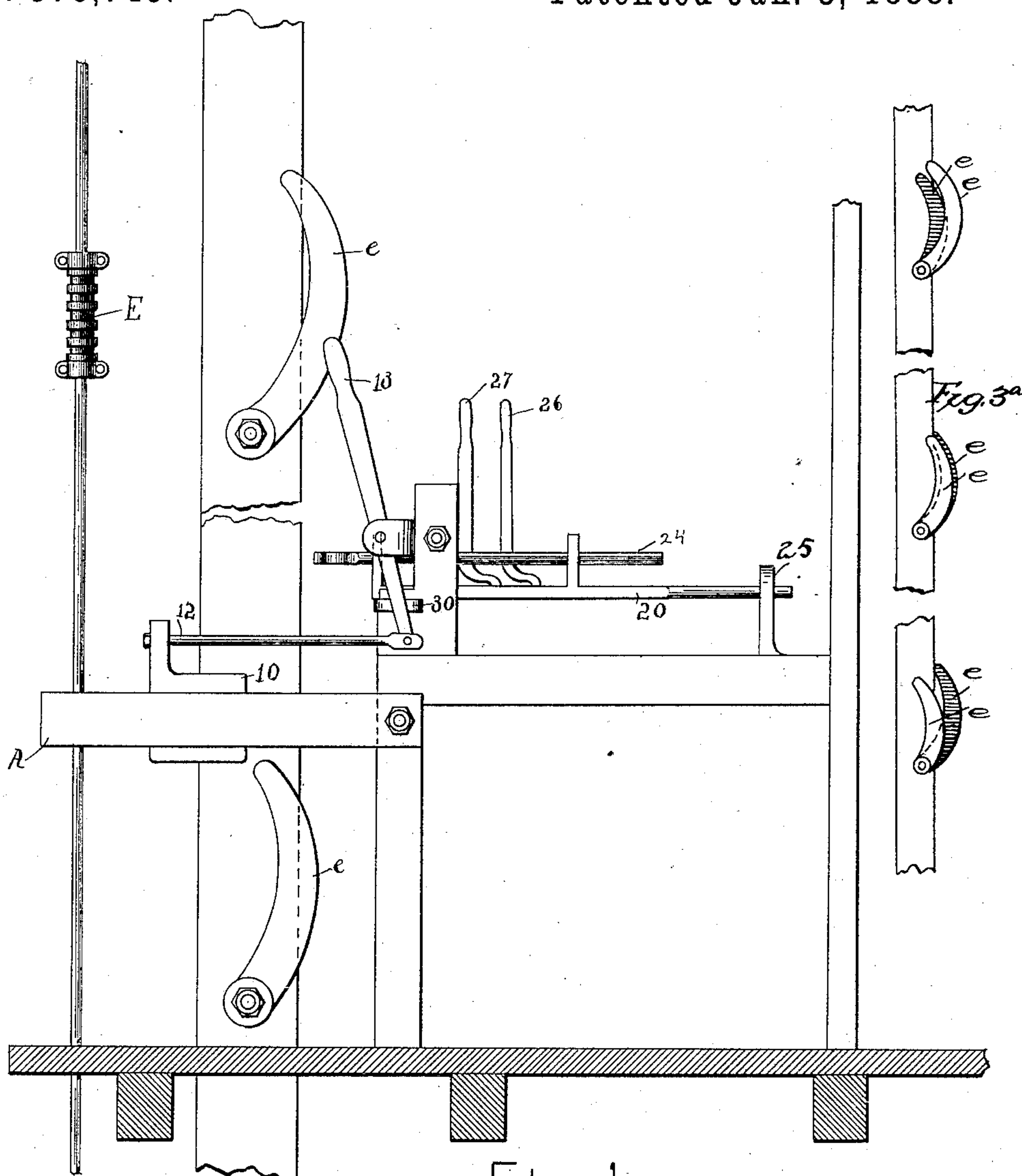


Fig. 1.

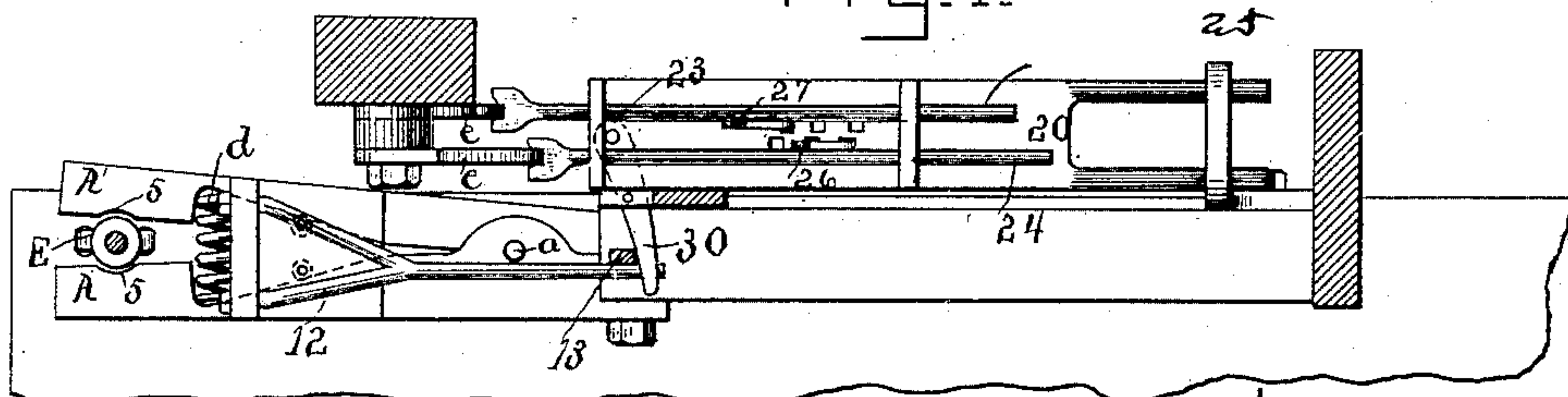


Fig. 3.

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Azz'ly

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2 Sheets—Sheet 2.

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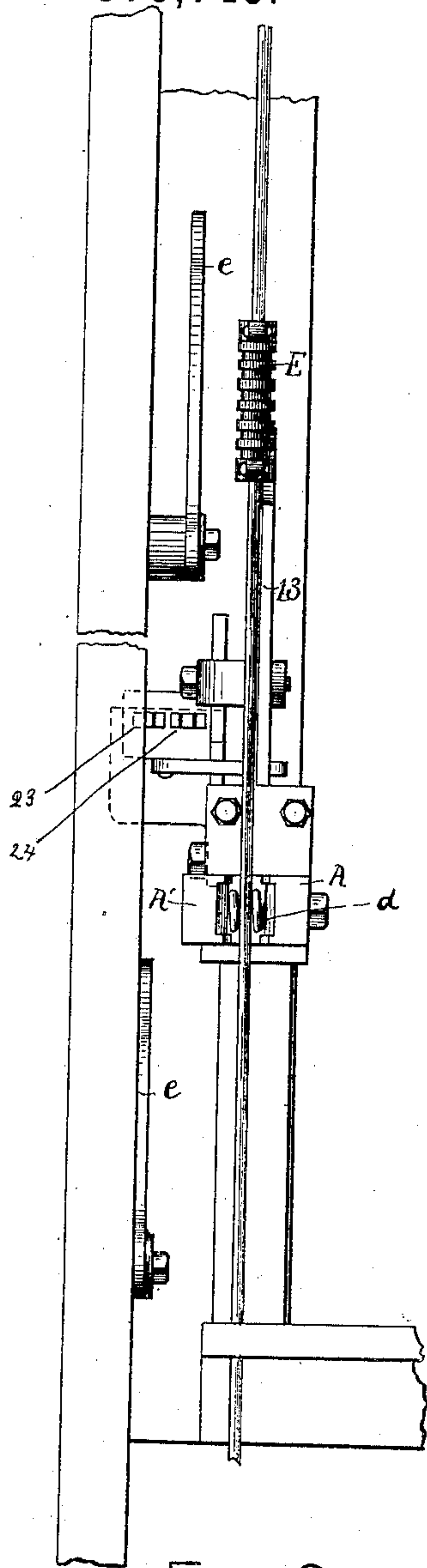


Fig. 2.

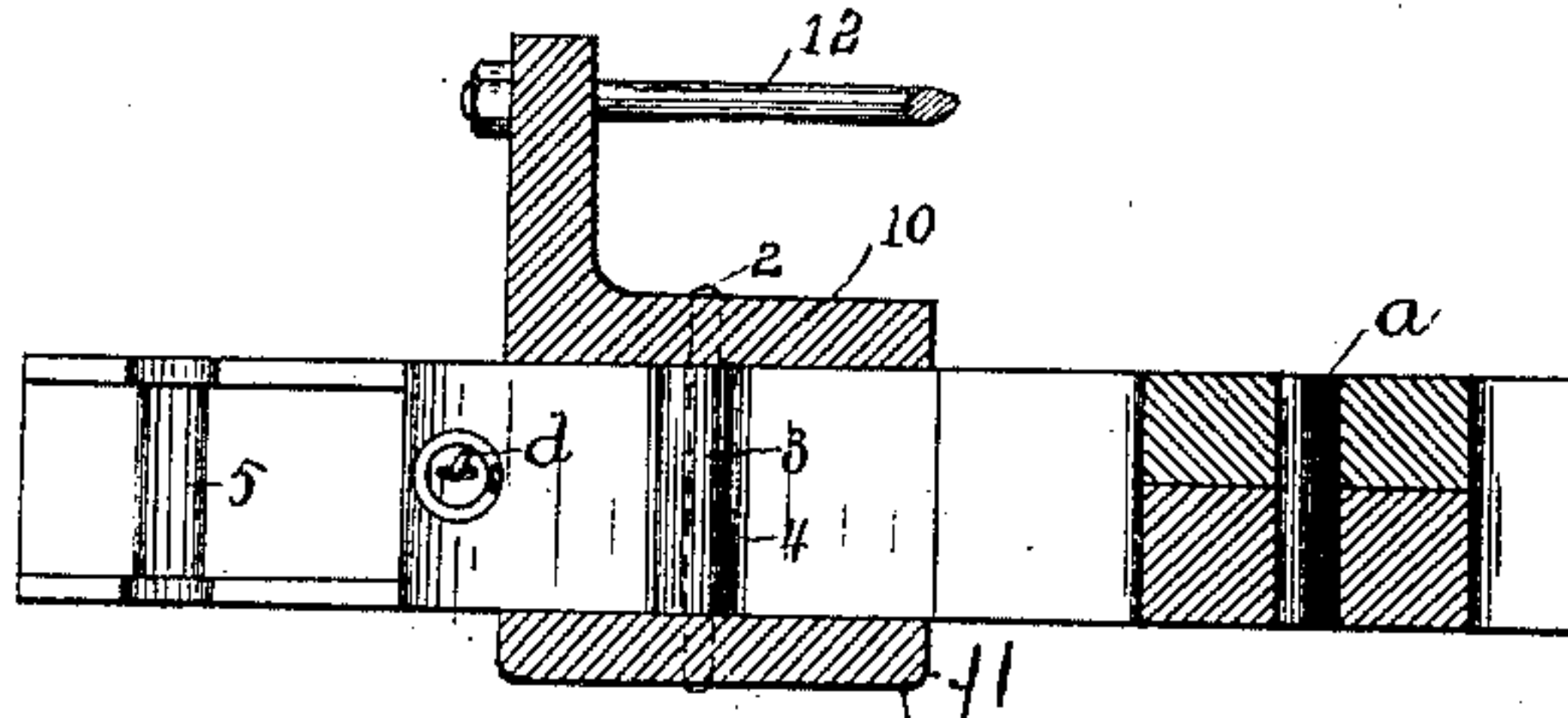


Fig. 5.

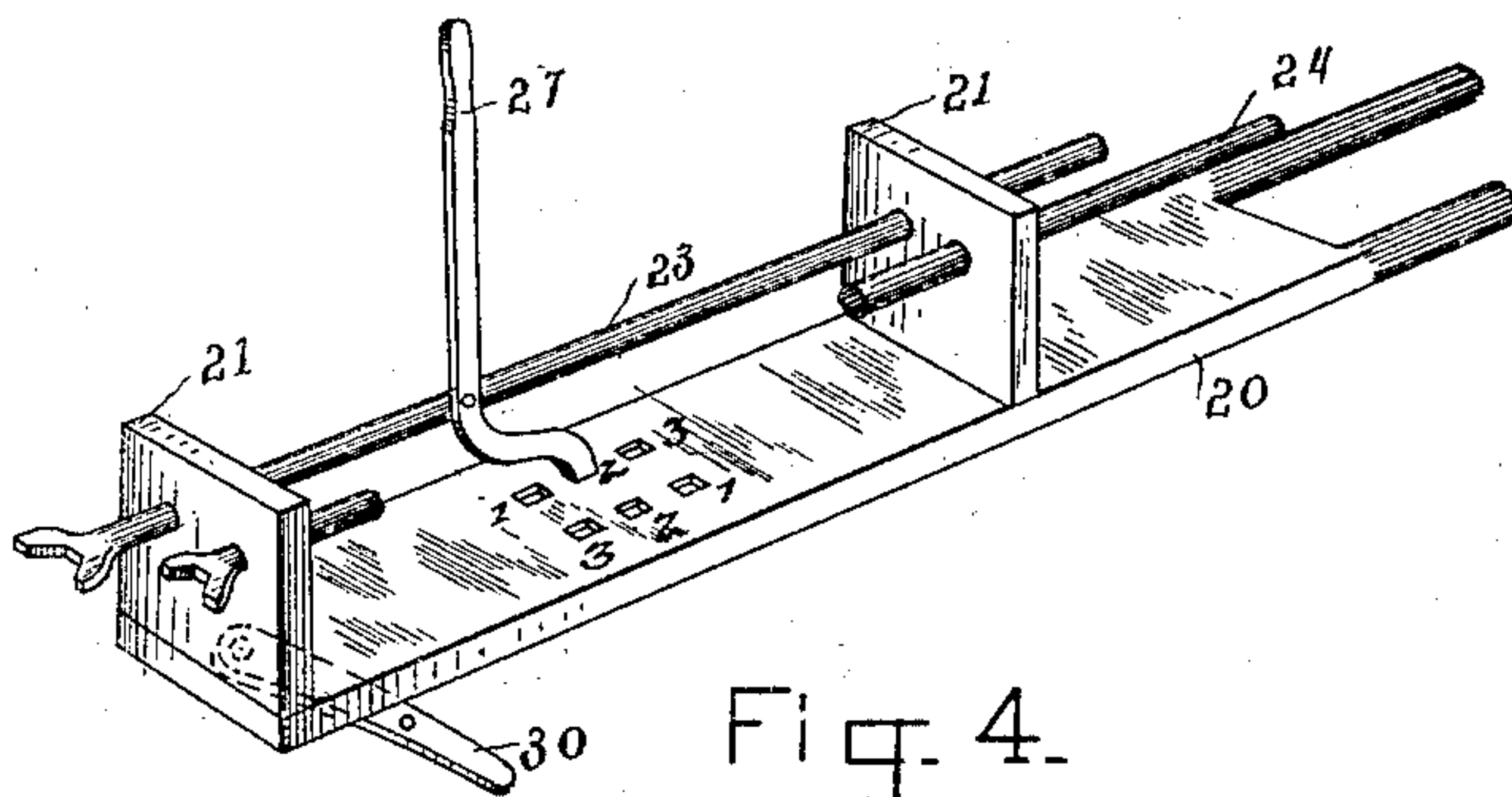


Fig. 4.

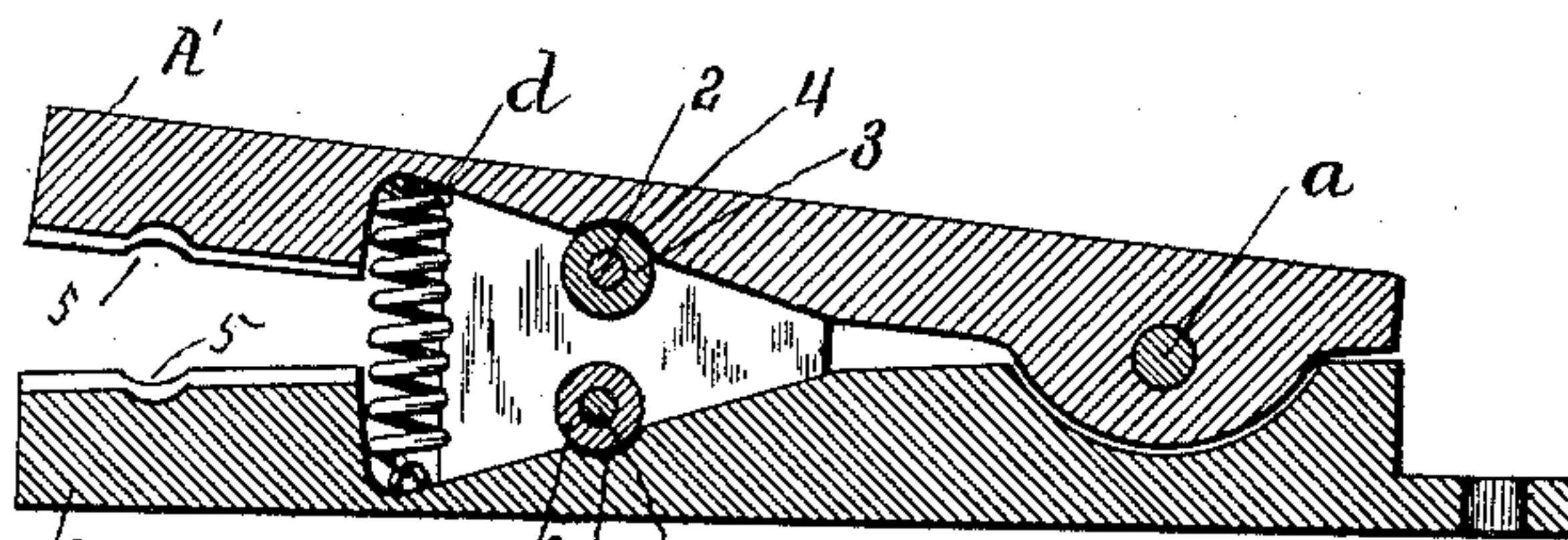


Fig. 6.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC STOP FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 375,745, dated January 3, 1888.

Application filed September 20, 1886. Serial No. 214,064. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. HANSON and WILLIAM F. BULLOCK, both of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Automatic Stops for Elevators, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to elevators, and has for its object to provide means to be attached to an elevator and adapted to be operated by a person at one point or floor, so as to automatically stop the elevator at any other predetermined point or floor of the building.

The nature of this invention is fully described and specifically claimed hereinafter.

Referring to the drawings, Figure 1 is a side elevation of the device complete as it is in operation. Such portions only of the elevator and its attachments are shown as are necessary to the complete and full understanding of this invention. Fig. 2 is a front elevation of the parts shown in Fig. 1. Fig. 3 is a sectional plan view of the lock and its operating mechanism. Fig. 3^a is a detail view showing the arrangement of cams on the elevator-well. Figs. 4, 5, and 6 are detail views, to be more fully referred to hereinafter. Fig. 5 is a vertical longitudinal section of the lock or device that is employed to engage with the elevator belt-shipper rope for the purpose of shipping the belt to start or stop the elevator.

This device is represented in plan view in Fig. 3, and by reference thereto it will be observed that the lock is provided with two jaws, A A', constituting, with other elements hereinafter described, a clutch mechanism. One of said jaws, A', is hinged at its rear end by a suitable pivot, *a*, to the jaw A, thus permitting its outer end to be moved toward and from the jaw A for engaging and releasing the shipper-rope. The jaws are constantly held together by force of the spring *d*, (see Fig. 6, which is a longitudinal cross-section of the jaws and their operating mechanism,) and when opened it is always against the tension of this spring. The opening movement is effected by the pins 2 2, and to this end the jaw-shanks are chambered out, as shown in Fig. 6, and these are provided with inclined faces

for the pins to work against. Above and below the jaws are plates 10 11, with their faces bearing upon the edge faces of the jaws. (See Fig. 5.) These plates receive the ends of the pins 2 2, so as to support and be supported by the pins. These plates, when moved rearward along the jaws, will carry backward the pins 2 2, and thus cause the jaws to open, as in Fig. 6. Said pins 2 2 are surrounded by anti-friction rolls 3 3, and in the faces of the jaws are small cavities 4 4, to allow the rolls to partially enter therein, as shown in Fig. 6, and these rolls, while in the cavities, are prevented from moving forward, and thus prevent the jaws from closing until sufficient force is applied to remove the rolls out of said cavities, where they can be operated by the tension of spring *d*, exerted through the inclined faces of the jaws. This lock or clutching mechanism is attached upon the elevator carriage, as represented in Fig. 1.

The operation of the plates or rolls, and consequently the opening of the jaws, is effected by means of the lever 13 and link 12. The device is so located that the shipper-rope will pass between the open jaws A A', as shown in Fig. 3; and when the elevator-carriage has reached the predetermined point or floor it is only necessary to have something operate on the lever 13 and lift the rolls 2 2 out of the cavities 4 4, and thus allow the jaws A A' to be drawn together by spring *d*, thereby grasping the shipper-rope and operating to stop the elevator. The jaws A A' are chambered out at 5 5 to better surround the rope, and on the rope at each station or stopping-place is fixed a comb, E, having corrugations to receive the edges of the jaws. Thus all tendency of the parts to slip past each other is avoided.

I now proceed to describe the mechanism employed for tripping the lever 13, in order to set the lock or catching device in operation to grasp the rope. To this end is employed the plate 20, which is provided with suitable brackets, 21 21, in which are journaled the bars 23 24. These bars have separate and independent movement longitudinally in their bearings relatively to the plate 20, and the plate 20 also has longitudinal or endwise move-

ment in its bearings 25. (See Fig. 3.) On the side of the elevator-well attached to the building, or to any suitable supporting-rod, are cam-leaves *e e*, &c., in line with the end of the forked bars 23 24, which engage with and force backward one of these bars, as occasion requires, when the elevator reaches that point. On the bars 23 24 are handle-levers 26 27, which are pivoted to the bars 23 24, respectively, and enter their bottom ends in suitable holes or cavities in the plate 20, as shown in Fig. 4. This arrangement so locks the bar and the plate together that any rearward movement of the bar is transmitted to the plate 20, causing it to move likewise. The holes or sockets in the plate 20 to receive the ends of levers 26 27 are numbered, the number of each hole in the series being made to correspond with the number of a floor in the building which contains the elevator, and the relative arrangement of parts is such that when the end of either of said levers is in a given hole the bar on which that lever is located is in position to engage the cam on the elevator-wall at the floor having the same number as the hole, and thus operate to force backward the bar and plate 20, as before described. On the plate 20 is a lever, 30, one end of which is pivoted to the plate 20, its center being pivoted to the lock-supporting frame, with its opposite end engaging the lever 13, all as shown in Fig. 3.

From the foregoing it will be understood that in order to prepare the elevator-carriage for its journey the operator places one hand upon the lever 13, and throwing this back he thereby opens the jaws *A A'* and carries the pins 2 2 backward into the cavities 4 4, where they remain until released, as before described. He then places one hand upon the lever 26 or 27, (it is to be understood that lever 26 is used when the elevator is to go in one direction and lever 27 is used if the elevator is to go in the opposite direction,) according as occasion requires, and moving this lever so as to lift its end out of one hole in plate 20 he moves it along and drops it into the hole numbered to correspond with the number of the floor in the building where it is intended for the elevator to stop. This operation brings the bar into position, so that when the elevator-carriage reaches the floor designated the cam *e* at that point will strike or engage the end of the bar and force it backward, thereby moving backward the plate 20 and operating the lever 30 so as to force forward the lever 13, (see Fig. 3,) and thereby lift the rolls 3 3 out of their respective cavities 4 4, and thus allow the jaws *A A'* to be closed together by spring *d* around the rope or comb *E*, so that any further movement of the elevator operates to ship the belt and stop the carriage. The operative parts may be located so as to cause the elevator to stop at the desired level or position. The cams *e e*, &c., are arranged in two series—one series for engaging the lever or bar 23 and the other for engaging the bar 24. The bar 24 may be used while the elevator travels in one direc-

tion, and to this end the cams in that series are positioned with the second one projecting forward slightly more than the first one, and each succeeding cam is arranged to project forward or outward slightly more than the next preceding one, so that the bar 24 may be positioned to strike any one of the series or pass them all to the last. The bar 23 is used when the elevator travels in an opposite direction, and the series of cams used in this case are arranged to project the same, but in exactly the opposite relation to the elevator-bar, as the first series.

The mechanism for moving the elevator-box up and down and the belt-shifting devices for starting and stopping the elevator are of the usual and customary kind. A rope extends the length of the elevator-well connecting with the belt-shifting lever, and may be operated in the usual way for starting and stopping the elevator. These mechanisms are all common and well known, and, excepting a portion of the rope, are not represented in the drawings.

The cams *e* are preferably formed with the curved edge shown, so that the action of the parts will be more gradual and steady and jarring will be avoided.

We claim—

1. In an elevator and in combination, a shipper-rope, a pair of pivoted jaws carried by the car and embracing said rope, a series of cams, as *e*, arranged along the elevator-well, a sliding bar on the car for engaging with said cams, a lever, as 26, for moving said bar and securing the same in any desired position, and means, substantially as described, between said sliding bar and the jaws whereby the movement of the bar, when actuated by the proper cam, will cause the jaws to clutch the shipper-rod, all substantially as described.

2. In combination, the shipper-rope, the clutching-jaws, the cams, a rod, as 24, said rod being adjustable and having sliding movement, and means, substantially as described, for connecting the said rod with the clutching-jaws, substantially as described.

3. In an elevator and in combination, a shipper-rope, the clutching-jaws, as *A A'*, a series of cams, as *e*, an adjustable sliding bar, 24, a plate, as 20, carrying said adjustable bar and having sliding movement, means, substantially as described, for adjusting the bar 24, and connections between the plate 20 and the clutching-jaws, substantially as described.

4. In an elevator and in combination, the shipper-rope, clutching-jaws, substantially as described, operating devices for said clutching-jaws, substantially as described, a series of cams suitably supported, each cam projecting into different vertical planes, a second series of cams also projecting into different planes, the two series being arranged reversely to each other, substantially as described.

5. In combination, the shipper-rope, the clutching-jaws, the double series of cams suitably supported, with one cam of each series in position corresponding to one of the floors,

and the independent devices, as bars 23 and 24, arranged to be acted upon by said cams, and connections, substantially as described, between said devices and the clutching-jaws, all substantially as described.

6. In combination, the shipper-rope, the clutching-jaws, the cams *e*, formed with curved edges, the sliding bar, as 24, and the intermediate mechanism between said bar and the clutching-jaws, substantially as described.

7. The combination of the jaws A A', having the inclined faces and cavities 4 4, the pins 2 2, and spring *d*, all substantially as described.

8. In a device of substantially the construction described, the combination of the bars 23 24, the plate 20, and the intermediate locking-levers, 26 27, the cams *e* on the elevator-well, arranged to operate said bars, and the lever 30, adapted to trip the locking or clutching mechanism, substantially as described.

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