

No. 630,417.

Patented Aug. 8, 1899.

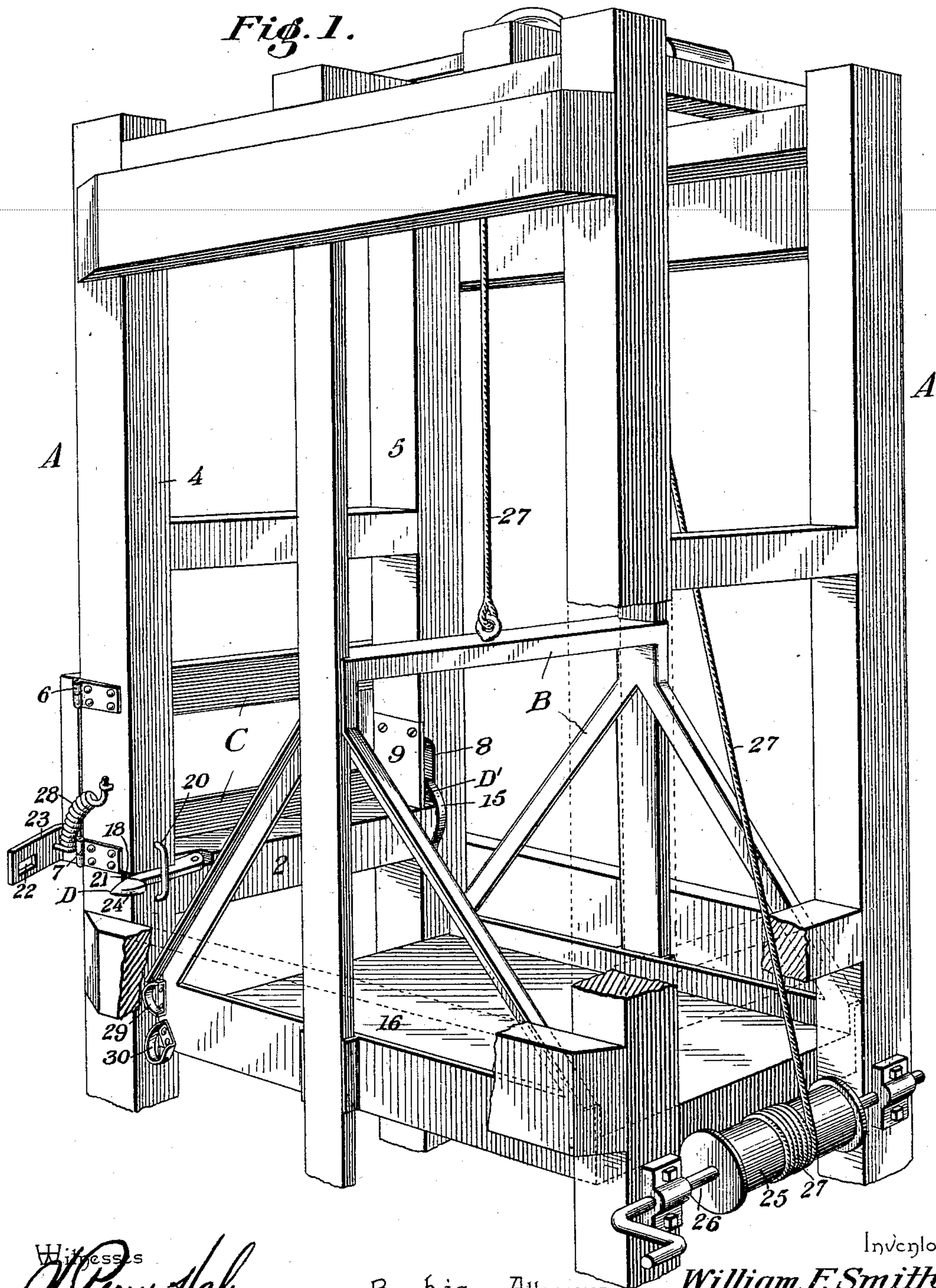
**W. F. SMITH.
ELEVATOR.**

(Application filed Mar. 17, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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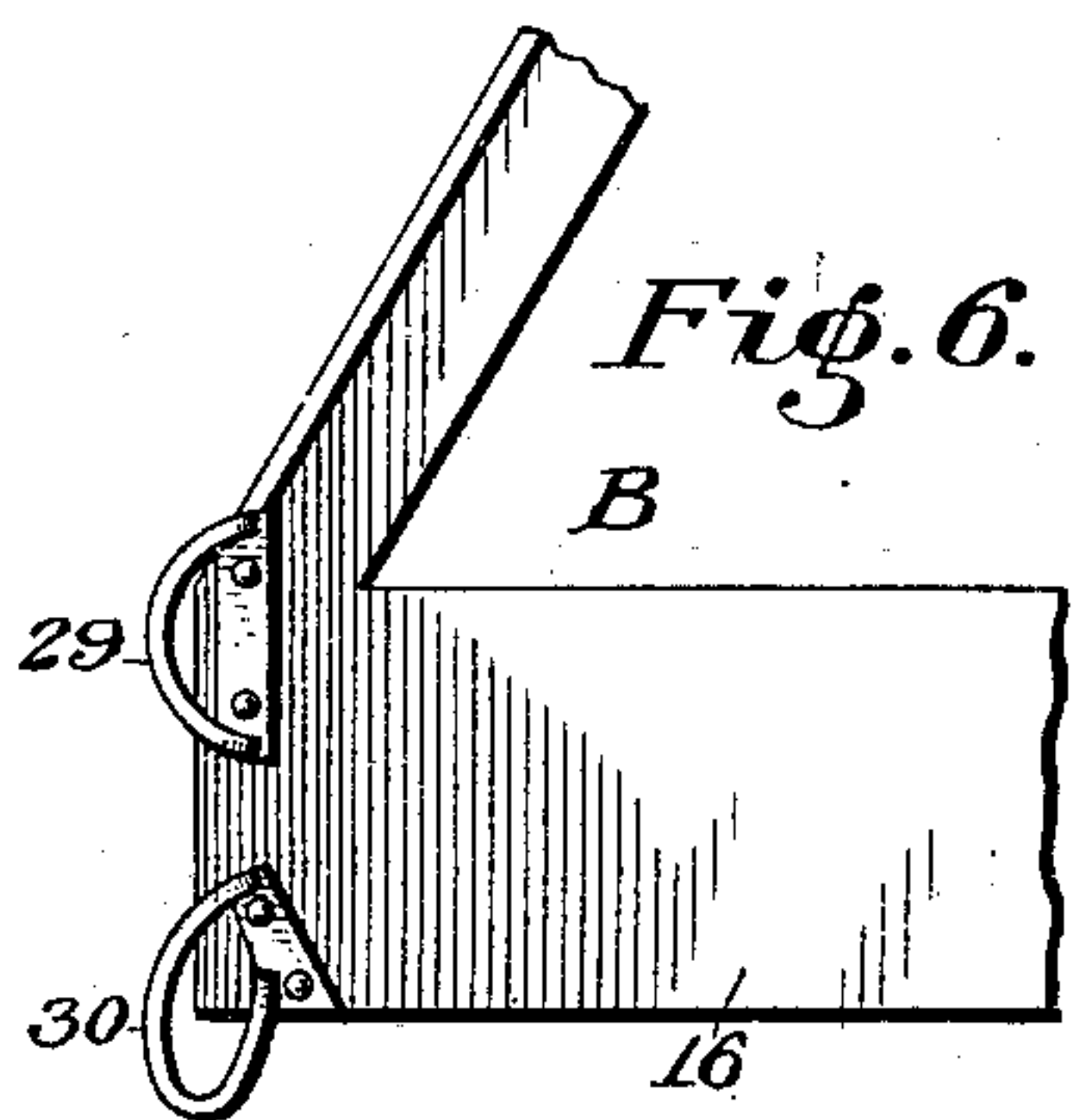
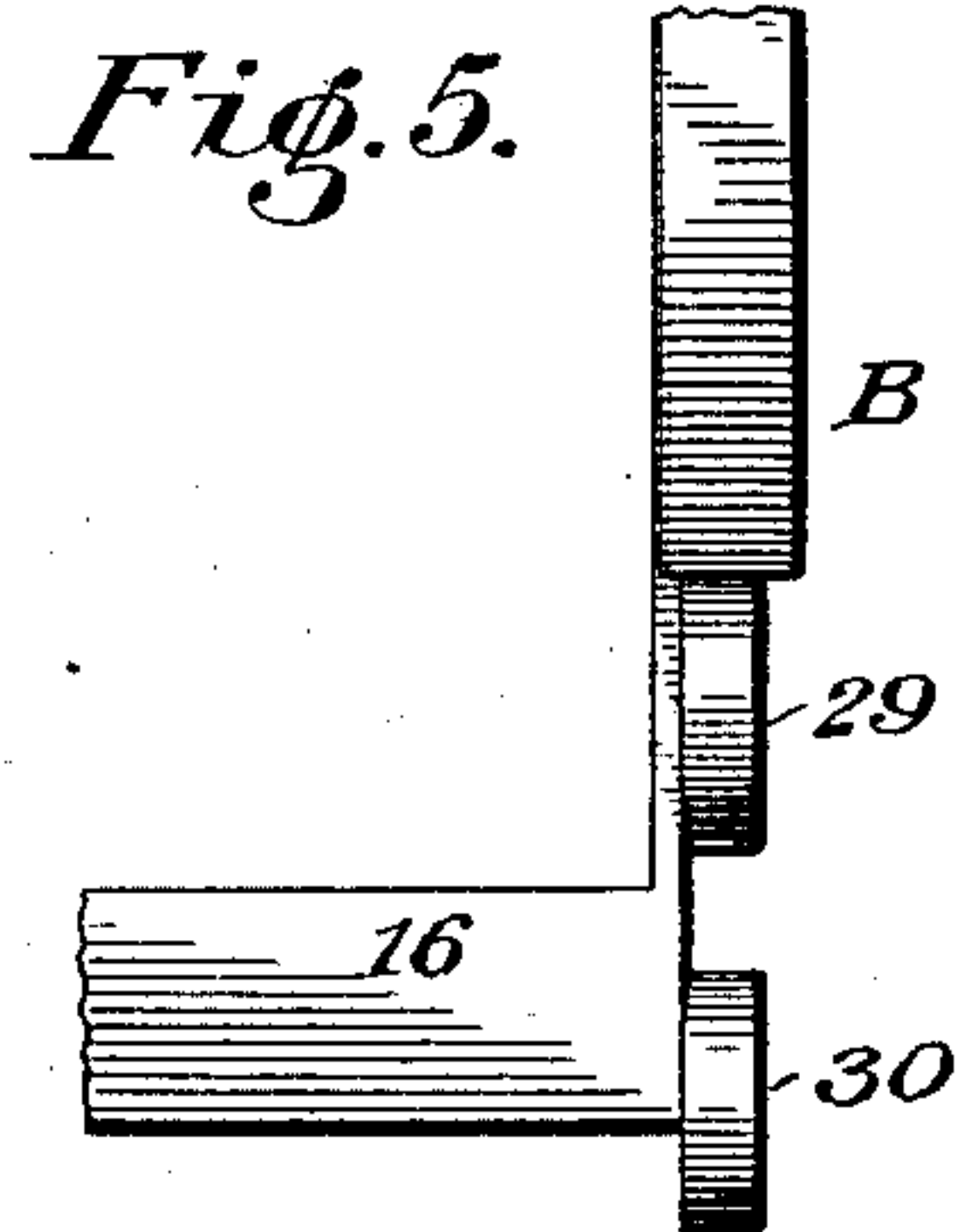
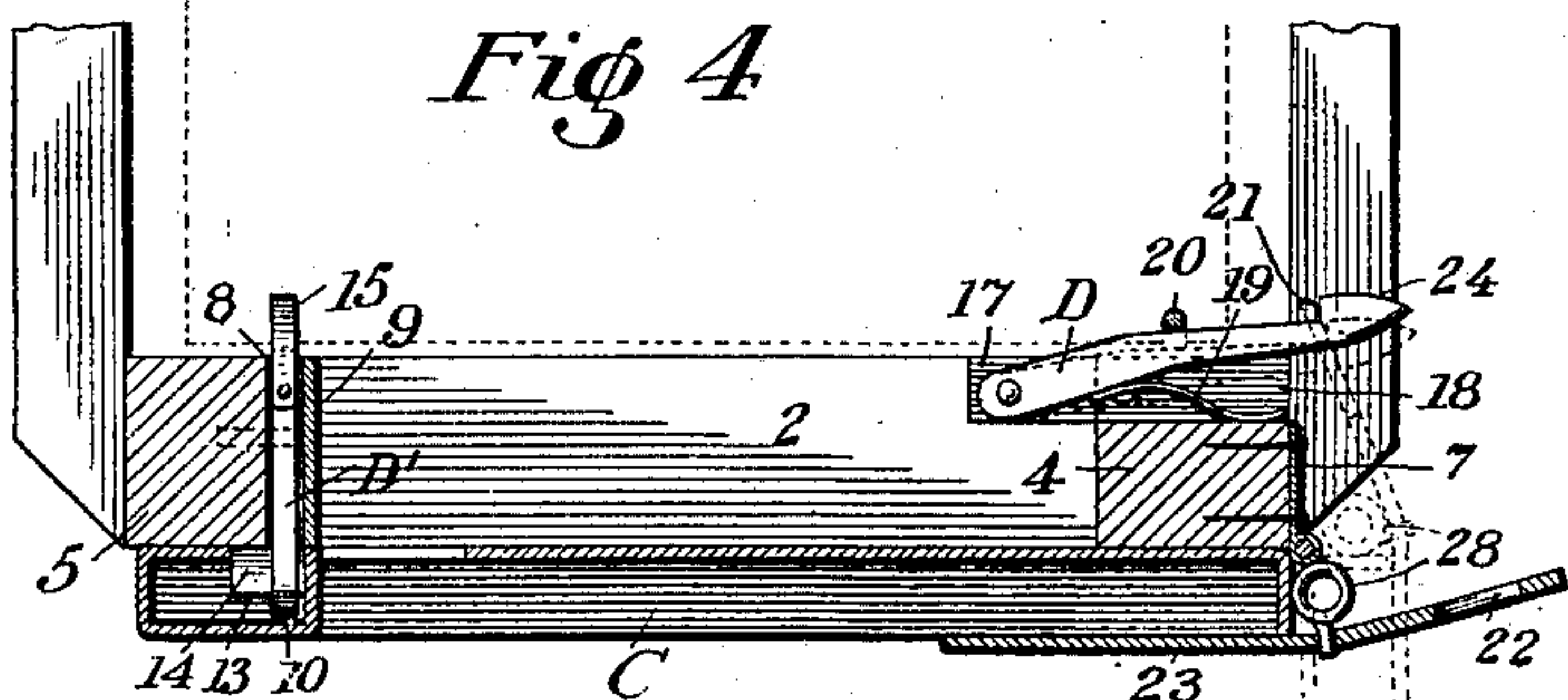
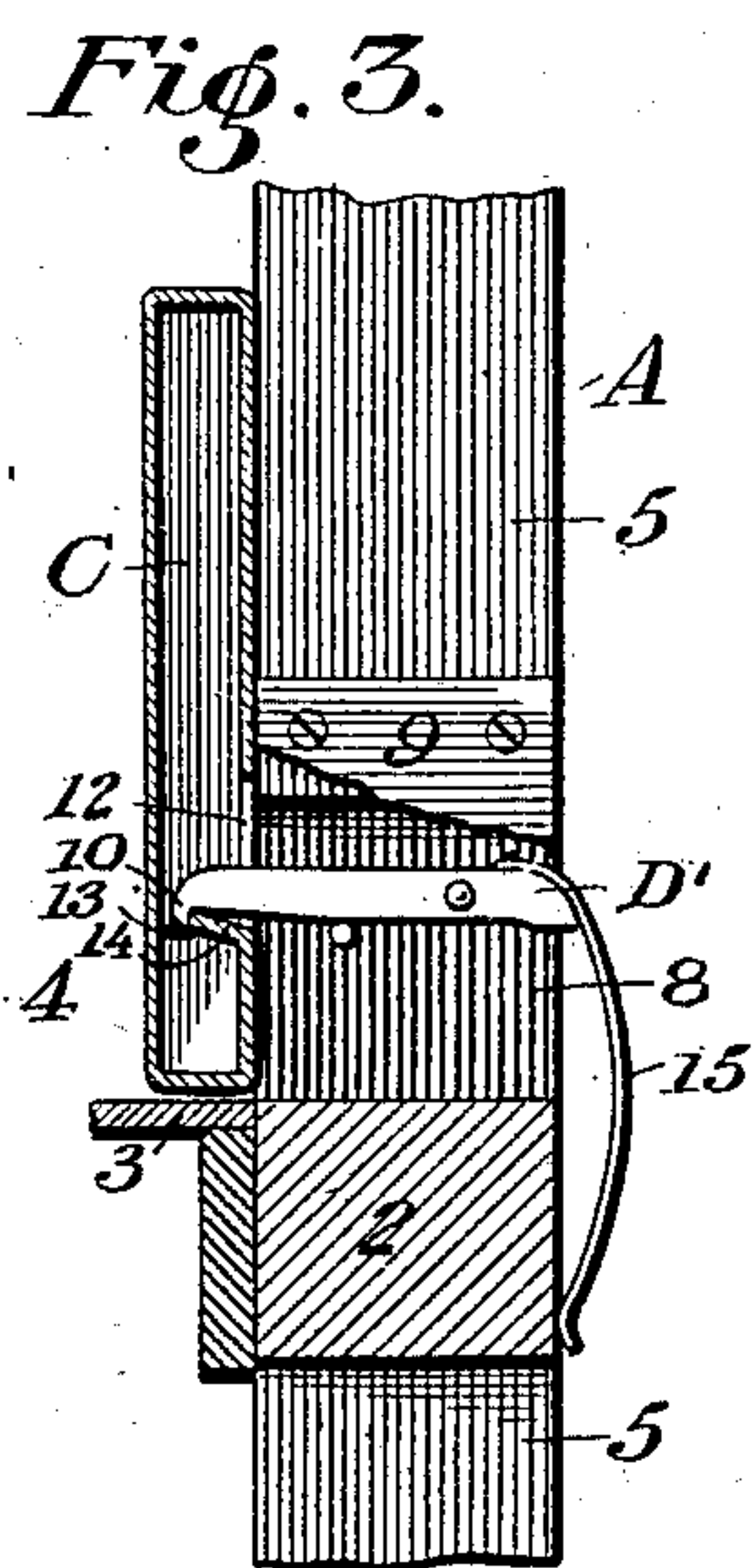
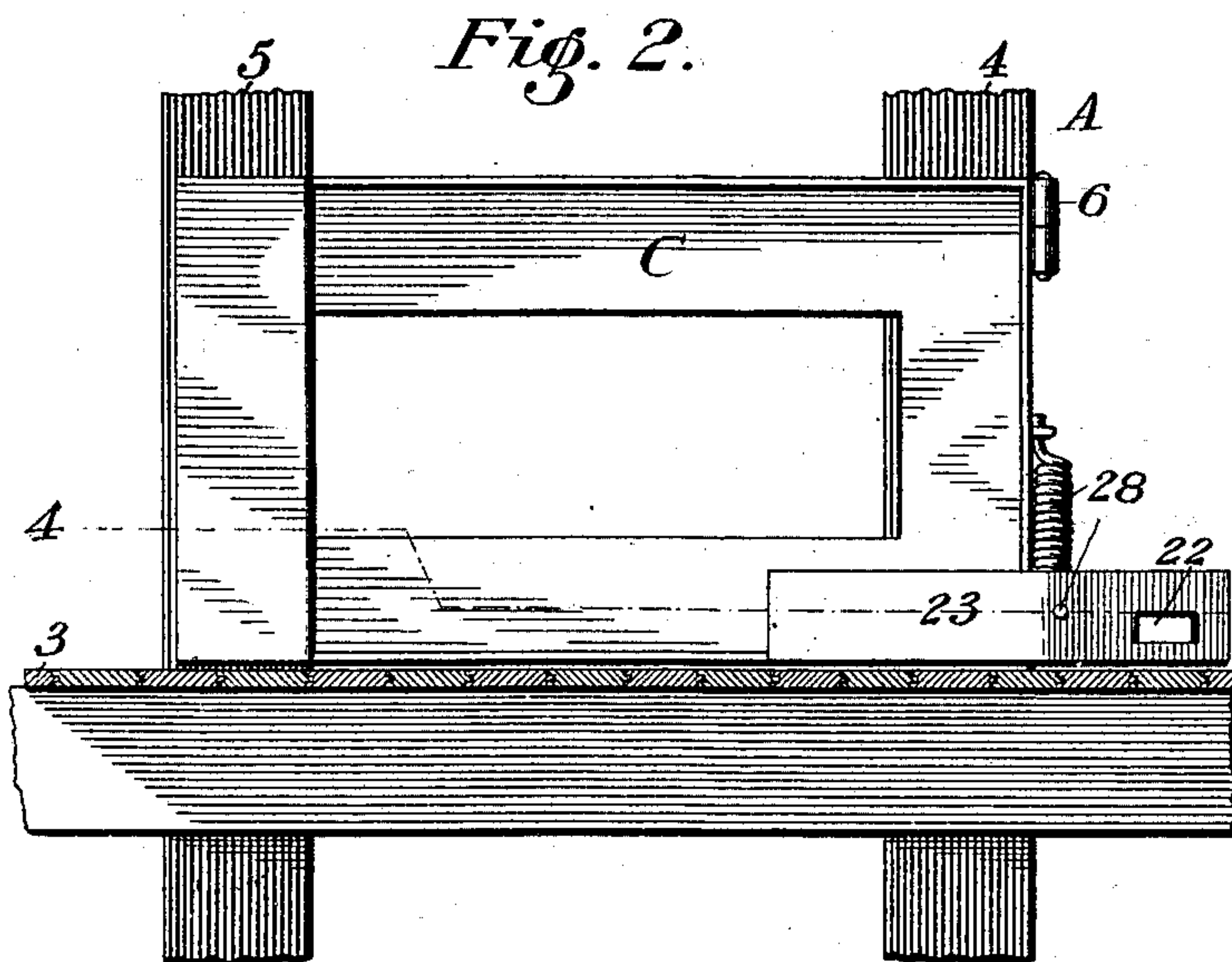
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

WILLIAM F. SMITH, OF CRIPPLE CREEK, COLORADO.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 630,417, dated August 8, 1899.

Application filed March 17, 1899. Serial No. 709,506. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. SMITH, a citizen of the United States, residing at Cripple Creek, in the county of El Paso and State of Colorado, have invented a new and useful Elevator, of which the following is a specification.

This invention relates to elevators, and more especially to means for automatically controlling the gates thereof which close the openings in the shaft, the object being to provide simple and quickly-operating mechanism controlled automatically by the elevator-car as the latter travels up and down in the well for locking the gates in their open and closed positions, respectively, and for also releasing said gates when the car passes above or below certain levels or floors.

In the present case I combine with a shaft or analogous structure having an elevator car or cage therein a gate closing an opening in the shaft, devices for locking the elevator in its open and closed positions, respectively, and means controlled by the elevator for operating said locking devices to effect the release of the gate, whereby the latter can be opened or shut, and by reason of this organization the gate will be maintained shut or closed at all times, except when the car or cage reaches a predetermined point, so that a person cannot walk into the shaft or well or in the case of a mine an ore-car or similar device cannot be pushed through the opening and into the shaft, as in cases of this kind serious injuries always occur. In the present case I prefer to employ a mechanically-closable gate in contradistinction to one that is shut or swung to by hand, as in this construction I secure very quick action, which is an important desideratum, and a spring constitutes a simple and convenient means for thus operating the gate.

With these ends in view the invention consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand the invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective view of an elevator-shaft, a car therein, and gate-controlling mechanism constructed in accordance with my invention. Fig. 2 is a front elevation of a portion of the shaft and the gate, the latter being shut. Fig. 3 is a transverse central section of the same with a portion of one of the uprights removed to show the latch that locks the gate closed. Fig. 4 is a horizontal section on the line 4 4, Fig. 2, and showing the gate in its closed and open positions by full and dotted lines, respectively. Fig. 5 is a detail in front elevation of a portion of the elevator, showing the two latch-trips thereon. Fig. 6 is a side elevation of the same.

Like characters denote like and corresponding parts in each of the several figures of the drawings.

In the drawings, A represents the shaft or framework of an elevating apparatus in which the car or cage B is suitably supported for ascending and descending movements, respectively, in the well-known manner, and indicates a sill or beam constituting a part of the framework and the upper edge of which is opposite the floor 3 of a building, and the opening between the uprights 4 and 5 of the framework or shaft adjacent to the horizontal sill 2 is normally protected by a gate C, which may be of any suitable construction and which when in its closed position, as indicated in Fig. 1, fits against the outer faces of the uprights 4 and 5. Said gate, which may be of any suitable construction or material, is hinged at some suitable points in its height to the upright 4, the superposed hinges 6 and 7, of ordinary construction, being illustrated for this purpose.

The gate, as hereinbefore set forth, is locked, respectively, in its open and closed positions by the latches D and D', respectively, and except in the particulars hereinafter specified these latches may be of any suitable character capable of securing the peculiar action accompanying the invention. The latch D' is supported within a recess 8 in the upright 5, which recess may be covered by the plate 9, serving as a guard and secured to the upright, and the working end of this latch is shouldered, as at 10, which shouldered portion works in the notch or aperture 12 formed in the framing of the gate, and the latter has

below the notch the offset or lug 13, the upper face of which is beveled, as at 14. The latch D' is maintained in its working position normally by a spring 15 of the bow type, the upper end of said spring being secured to the upper side of the latch near the rear end of the latter, and the lower end of the spring being free and bearing against the inner side of the upright 5 at a point below the level of the floor. The operation is such that when the gate C is nearly closed the beveled face 14 of the offset 13 will come in contact with the shouldered end 10 of the latch and will as the gate advances raise said shouldered end, so that when the gate reaches its fully-closed position the shoulder 10 can be forced over the offset 13 by the spring 15. It will be evident that pressure upon the spring 15 at any point in its length will press the same inward toward the upright 5, whereby the latch D' will be lifted and the shoulder 10 thereon carried clear of the offset or lug 13, whereby the gate can be opened. In this connection it will be apparent that the spring is in the nature of a trip device, and it will be preferably operated by the floor or platform 16 of the car as the latter is raised or lowered in its shaft.

The latch D for locking the gate open is pivoted in the recess 17 of the sill 2 and has a rearward stroke into the recess 18 in the upright 4. The latch D' is movable on a horizontal axis above the sill 2, while the latch D is sustained by said sill and is movable upon a vertical axis.

The latch D is maintained in its effective position by the spring 19, one end of which is secured thereto and the opposite end of which bears against the inner face of the recess 17, the outward motion of the spring-actuated latch being limited by the stop or bar 20, secured at its ends to the upright 4 and extending across the recess 18.

The working end of the latch D is provided with a shoulder or hook 21 and is projectable through the opening 22, located near the rear or free end of the plate 23, which is secured to the under side of the gate C and projects for some distance therebeyond.

The working face of the shoulder or hook 21 is beveled, as at 24. When the gate C is opened and has nearly reached its wide-open position, the end of the latch will extend through the opening 22, so that the rear wall of said opening by riding along the beveled face 24 can force the latch into the recess 18 until the gate has reached the limit of its opening movement, at which time the shoulder or hook 21 will be thrown into engagement with the plate 23 by the action of the spring 19.

Any convenient mechanism for operating the elevator can be employed, the drum 25 connected with a suitable motive power (not shown) being illustrated for this purpose, and the drum 25 is secured to the shaft 26, supported by suitable bearings upon the frame-

work, and it has wound thereon the cable 27, the end of which is connected with the upper side of the car.

As a means for closing the gate quickly I prefer to employ the coiled spring 28, secured at one end to the upright 4 and at its opposite end to the gate C, near one corner of the latter, although, of course, an equivalent device can be employed for this purpose. When the gate is wide open and is held in such position by the latch D, it will be evident that the spring 28 is under compression. When said latch is tripped to carry the shoulder or hook 21 thereon out of engagement with the plate 23, the gate will be released and will be instantly shut by the relaxing coiled spring 28, and when it reaches its closed position it will be locked by the action of the latch D' in the manner hereinbefore described. The elevator-car as it rises and falls serves by engaging the bowed spring 15 to compress said spring, thereby lifting the latch D', so that when said car passes out of contact with the spring the latter will serve to throw the latch into its operative position, and the floor 16 of the car serves to thus operate the spring.

For the purpose of tripping the latch D the superposed trips 29 and 30 are provided, these being of bow shape and being secured to the forward side of the car in such position as to engage the pivoted latch D at a point beyond the fulcrum of the latter, and the disposition of the parts is such that the working period of the spring or trip device 15 is intermediate the working periods of the two trips 29 and 30.

It will be assumed that the gate C is closed and held shut by the pivoted latch D' engaging the same and that the elevator-car is rising from the position shown in Fig. 1. When said car nearly reaches the level of the floor, the trip 29 will strike the latch D and force the same outward, and at about the time the level of the floor 3 is reached by the car-floor 16 the latter will strike and compress the spring 15, so that the end of the latch D' is elevated for the purpose of releasing the gate C. The gate may then be swung wide open by hand until the plate 23 thereon is engaged by the latch D for the purpose of locking said gate open. At this time it will be observed that the trips 29 and 30 are located respectively above and below the latch D, so that in case the elevator is either raised or lowered one of said trips will strike and operate the latch for the purpose of releasing the gate, which will be instantly shut by the coiled spring 28.

From the foregoing description it will be evident that I provide simple means for locking the gate in its two extreme positions and for automatically effecting the release of same when in either of said positions by means controlled by the car or cage B. It will be evident also that the trips 29 and 30 and spring 19 are disposed in different positions horizontally and are located at opposite

sides of the shaft, so as to secure the proper action of these parts.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what I claim is—

1. In an apparatus of the class described, the combination with a shaft, having a lateral opening, and an elevator-car in said shaft, of a laterally-swinging gate closing said opening, means for mechanically closing the gate, a horizontally-disposed spring-actuated latch, having its free shouldered end projecting beyond one side of the shaft and adjacent to the hinged side of the gate, and adapted to engage and hold the latter in its open position, and a trip carried by the elevator-car and adapted to release the latch, substantially as shown and described.

2. In an apparatus of the class specified, the combination with a shaft having a lateral opening, and an elevator-car therein, of a laterally-swinging gate hinged to the shaft and closing the lateral opening therein, means for mechanically closing the gate, a horizontally-disposed spring-actuated latch carried by the inner side of the shaft, and having its free shouldered end projecting beyond one side of the shaft and adjacent to the hinged side of the gate, a plate carried by the gate and projecting beyond the hinged side thereof, and provided with a slot adapted to receive the free end of the latch and thereby hold the gate open, and a trip carried by the elevator-car and adapted to disengage the latch, substantially as shown and described.

3. In an apparatus of the class specified, the combination with a shaft having a lateral opening therein, and an elevator-car located within the shaft, of a laterally-swinging gate hinged to the shaft and closing the lateral

opening therein, and provided in its inner face and near its free side with a notch having an inwardly and upwardly extending lug or offset located at the lower side of the notch, a vertically-movable latch mounted upon the shaft and having its shouldered free end adapted to be lifted by the keeper and engaged therewith, and a bowed spring connected to the opposite end of the latch and having its free end slidably engaging the inner side of the shaft, and located within the path of the elevator-car, substantially as and for the purpose set forth.

4. In an apparatus of the class specified, the combination with a shaft having a lateral opening, and an elevator-car located within the shaft, of a gate closing said opening, means for mechanically closing the gate, a vertically-movable latch carried by the shaft, located within the path of the elevator-car, and adapted to lock the gate in its closed position, a horizontally-movable latch carried by the shaft and adapted to hold the gate in its open position, and a pair of trips carried by the elevator-car and adapted to successively operate the horizontally-disposed latch, substantially as and for the purpose set forth.

5. In an apparatus of the class specified, the combination with a shaft having an opening, of an elevator-car in said shaft, a gate closing said opening, a spring connected with the gate and with the shaft, a slotted plate secured to the gate, a spring-actuated latch projectible through the slot in said plate and adapted to engage the latter, and a trip connected with the elevator for operating said latch, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WM. F. SMITH.

Witnesses:

D. MACMASTER,
J. L. SMITH.