No. 819,208. PATENTED MAY 1, 1906.

C. A. CRIQUI.

DOOR RELEASING APPARATUS.

APPLICATION FILED MAY 2, 1905.

3 SHEETS—SHEET 1.

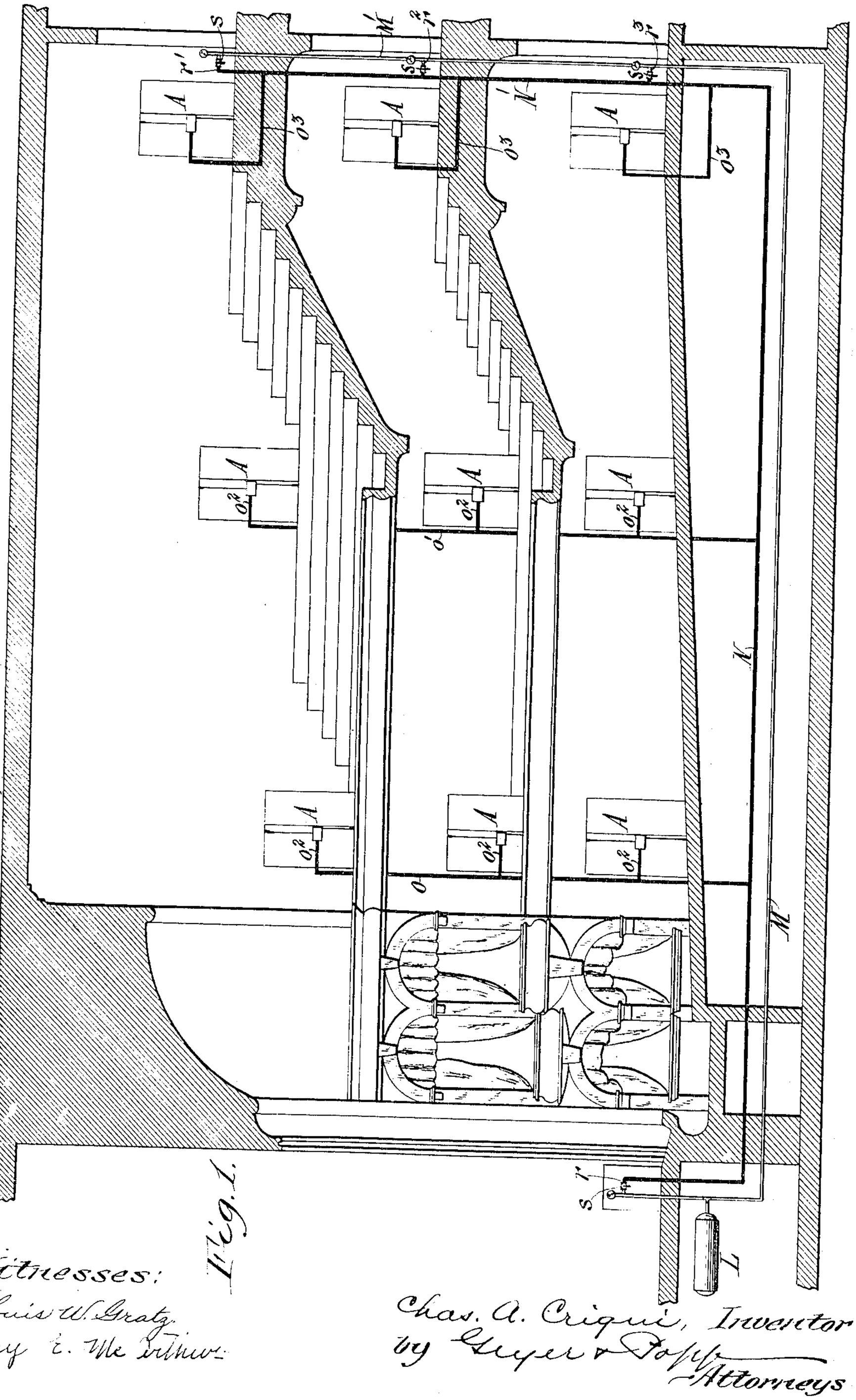

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 3.

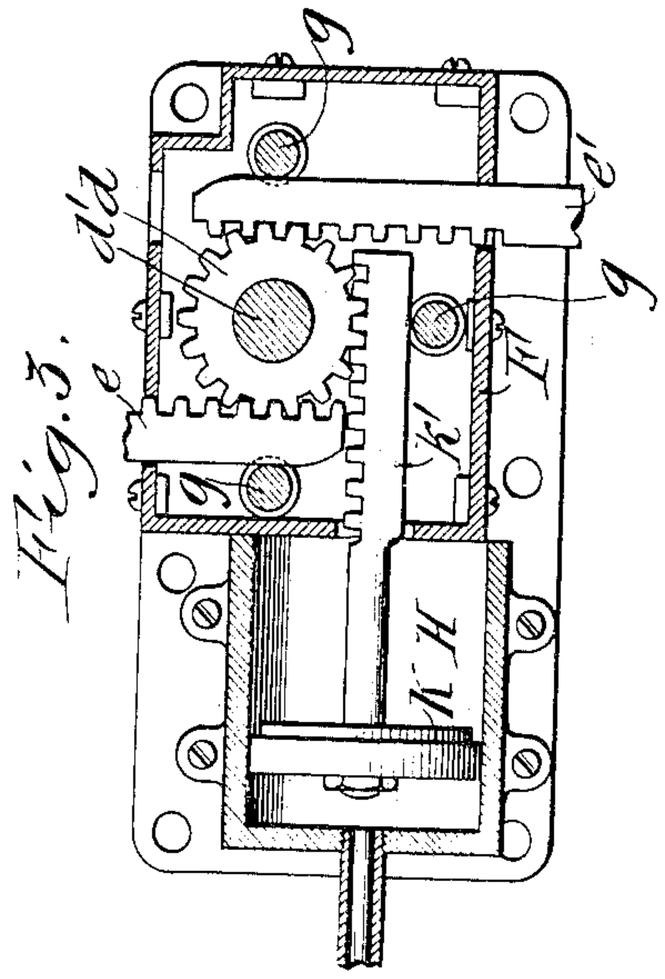
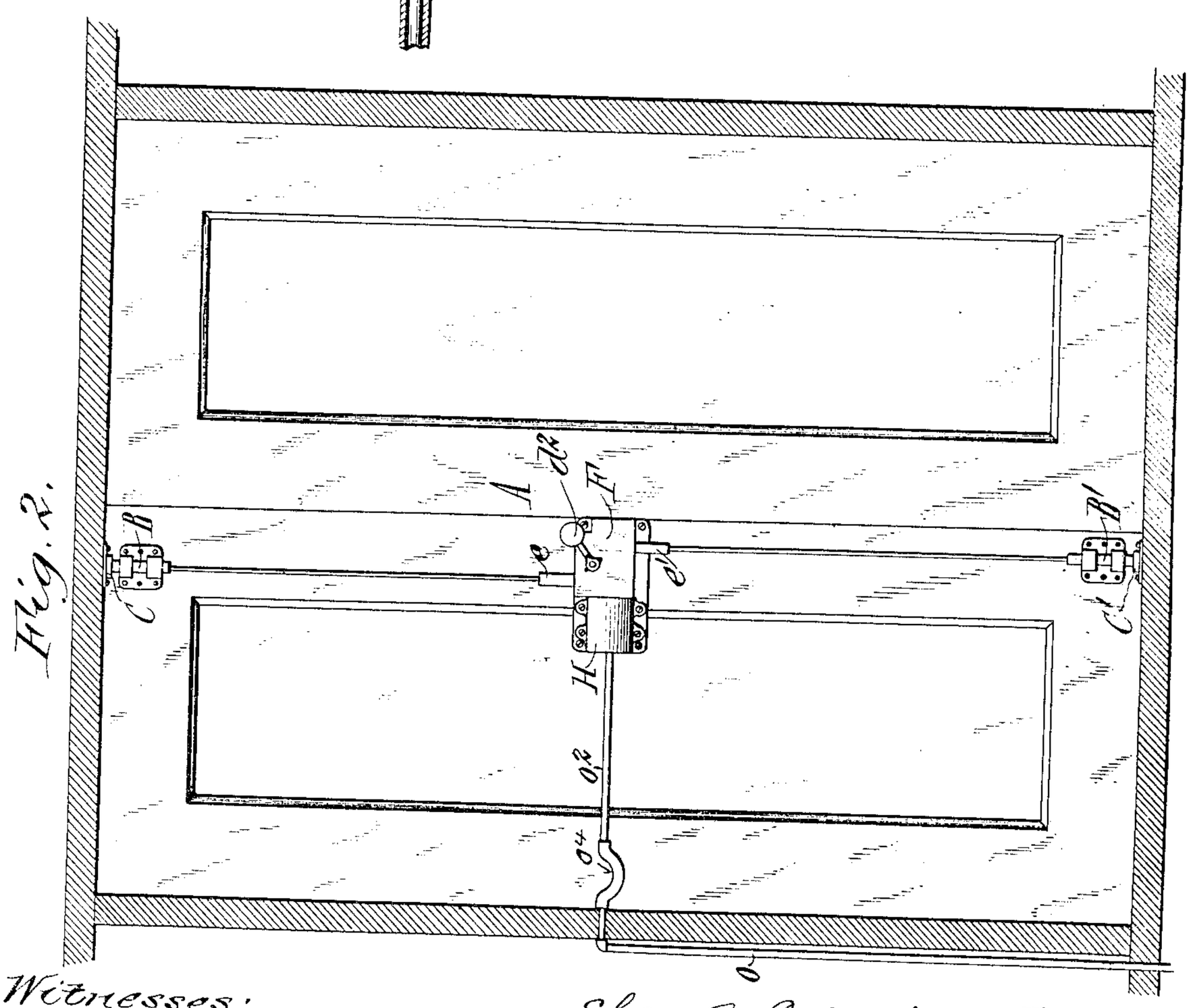


Fig. 2.



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No. 819,203. PATENTED MAY 1, 1906

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DOOR RELEASING APPARATUS.

APPLICATION FILED MAY 2, 1905.

3 SHEETS—SHEET 3.

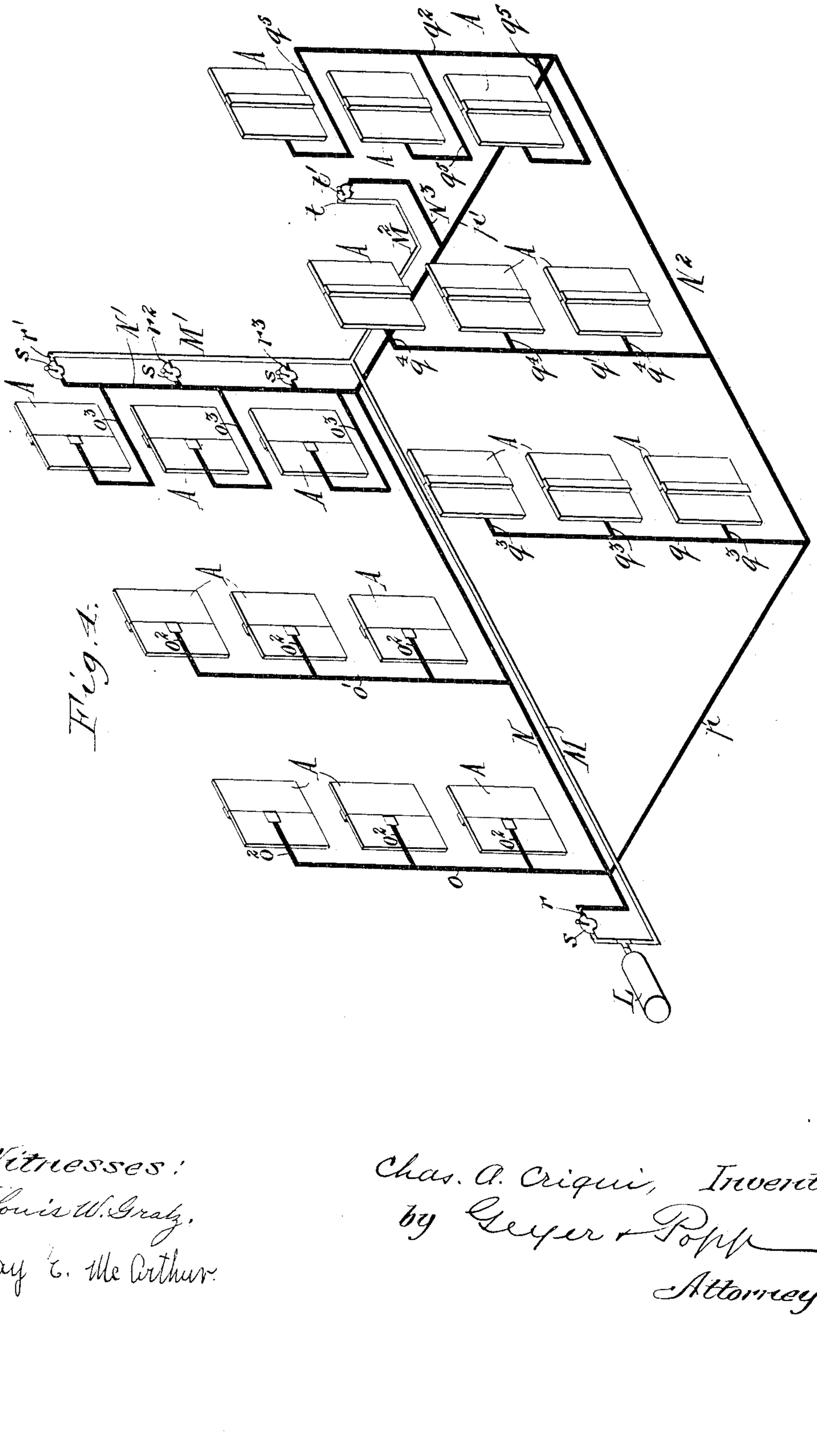

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES A. CRIQUI, OF BUFFALO, NEW YORK.

DOOR-RELEASING APPARATUS.

No. 819,208. Specification of Letters Patent. Patented May 1, 1906.

Application filed May 2, 1905. Serial No. 258,480.

To all whom it may concern:

Be it known that I, CHARLES A. CRIQUI, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Door-Releasing Apparatus, of which the following is a specification.

This invention relates to a releasing apparatus for opening or unbolting the exits of theaters, factories, schoolhouses, asylums, hotels, &c., to permit the ready escape of the occupants in case of fire or a panic.

The object of the invention is to provide a reliable apparatus of this kind by which all the exits of such buildings can be released or opened simultaneously from different parts of the same.

In the accompanying drawings, consisting of three sheets, Figure 1 is a vertical longitudinal section of a theater equipped with the improvement. Fig. 2 is a face view of a pair of doors, showing the pneumatic bolt-operating device and connections. Fig. 3 is a vertical longitudinal section of said operating device, on an enlarged scale. Fig. 4 is a diagrammatic perspective view of the several exits and the pipe connections leading to their bolt-operating devices.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the doors or exits, preferably arranged in pairs and hinged to swing outward. One door of each pair has vertically-sliding bolts B B′, suitably guided thereon and entering sockets C C′, secured to the floor and the lintel, respectively.

In the preferred apparatus shown in the drawings the two bolts of each pair of doors are simultaneously retracted by a gear-pinion *d*, mounted on a horizontal shaft *d′* and meshing with oppositely-arranged gear-racks *e e′*, formed on or connected with the bolts, so that upon turning the shaft in one or the other direction the bolts are projected or withdrawn in an obvious manner. The shaft is journaled in a casing F, secured to the inner side of the door carrying the bolts, and is provided with a crank d^2 for throwing the bolts by hand to lock or unlock the doors. The gear-racks pass through openings in the top and bottom of the casing and are held in engagement with the pinion *d* by antifriction-rollers *g*, journaled in the casing.

H is a pressure-cylinder, preferably mounted on the same base-plate as the casing F and containing a piston K. The latter carries a gear-rack *k′*, which meshes with the gear-pinion *d*, so that when the piston is driven forwardly by admitting compressed air or other motive fluid to the cylinder the shaft *d′* is turned in the proper direction to retract the bolts B B′ and release the doors. In practice the piston-rack *k′* is in a different plane from the bolt-racks *e e′*, and the gear-pinion is of sufficient width to engage with the several racks.

All of the doors on the several floors of the theater or other building are provided with such a pneumatic bolt-operating mechanism. While I prefer the mechanism herein shown and described, other suitable pneumatic or fluid-operated means may be employed for this purpose.

L is a tank adapted to contain compressed air or other fluid under pressure and located in a suitable part of the building. M is a main pressure line or pipe connected with said tank and extending lengthwise through the basement or along the lower floor of the building to the front part of the same and thence vertically through the several floors, either along the tier of doors next to the foyer, as shown in Figs. 1 and 4, or centrally of the wall between the auditorium and the foyer, the vertical portion of said main line being designated M′.

N N′ indicate a supplemental line or pipe, preferably running adjacent to and parallel with the corresponding horizontal and vertical portions M M′ of the main line and extending from a point near the pressure-tank to a point opposite the upper extremity of the main line. With this supplemental line are connected upright pipes *o o′*, extending through the several floors of the buiilding and along the adjacent tiers of doors, and from them lead lateral branch pipes o^2, each connected with one of the pressure-cylinders H on that side of the house. The pressure-cylinders of the doors next to the foyer and on the same side of the building are supplied from the supplemental line N N′ by individual branch pipes o^3.

N^2 is an extension of the supplemental line arranged at that side of the building opposite the main line M M′ and serving to supply the pressure-cylinders of the doors on that side of the building. This extension is connected with the supplemental line by transverse pipes *p p′*.

q q′ q^3 are upright pipes rising from and connected with the extension N^2 and corre-

sponding to the pipes *o o'*, and q^3 q^4 q^5 are branch pipes leading therefrom to the pressure-cylinders on the last-named side of the building and corresponding to the branch pipes o^2 o^3. Ordinary hose or other suitable flexible joints may be employed for connecting the pipe-sections mounted on the doors and the door-frames, as shown at o^4 in Fig. 2, to permit the doors to be opened and closed without breaking the connection between the cylinders H and supplemental pressure-line.

r r' r^2 r^3 indicate short pipes connecting the supplemental line N N' with the main line M M' and preferably located on the stage on the ground floor and in the balcony and the gallery when the apparatus is installed in a theater or similar building. Each of these pipes or connections is provided with a hand-valve *s* for controlling the passage of the pressure fluid from the main line into the supplemental line and thence to the cylinders. It is also desirable to control the release of the doors from the foyer of the theater, and for this purpose the main and supplemental lines have extensions M^2 N^3, leading to that part of the building, these extensions having a connection *t*, containing a controlling-valve *t'*, as shown in Fig. 4.

In the normal condition of the apparatus the various controlling-valves are closed and the main line M M', with its extension M^2, is under pressure, while the supplemental line N N' and its extensions N^2 N^3 and their connections are empty, permitting the bolts of the several doors to be freely and individually operated by hand, if desired.

When it is desired to release all of the doors or exits simultaneously, as in the event of a fire or panic, this is quickly and positively accomplished by simply opening any one of the several controlling-valves, when the pressure fluid will instantly pass through the supplemental line and its branches into all of the pneumatic cylinders, actuating their pistons and withdrawing the bolts of all the doors.

From an inspection of Fig. 4 it will be observed that there is free communication between the supplemental line and all the branches and pressure-cylinders connected therewith, and therefore the opening of any one of the controlling-valves permits the motive fluid to pass from the main pressure-line to all parts of the supplemental line and is followed by the practically instantaneous release of all the doors. As the controlling-valves are located not only on the stage and in the foyer, but on the upper floors of the building as well, the entire system of doors can be released by an attendant or other person stationed in any part of the house, permitting a hasty exit of the audience and effectually guarding against the deplorable loss of life which often attends the breaking out of a fire in a theater or similar public building where persons gather in large numbers.

I claim as my invention—

1. An apparatus for simultaneously releasing a plurality of doors from different points, comprising pneumatic operating means for the bolt of each door, a source of fluid-pressure, a main pressure-line connected with said source, a supplemental pressure-line extending along the main line, connections between said main and supplemental lines located in different parts of the building, controlling-valves in said connections, and branch pipes leading from said supplemental line to said individual bolt-operating means, substantially as set forth.

2. In an apparatus for simultaneously releasing a plurality of doors from different points the combination with a building having a plurality of floors or stories and exit-doors on each floor provided with bolts, of pneumatic operating means for the bolt of each door, a source of fluid-pressure, a main pressure-line connected with said source and rising to the uppermost of the floors included in the system, a supplemental pressure-line extending along the main line, valved connections between said main and supplemental lines located on different floors, and valveless branch pipes connected with the supplemental line at different floors and leading to said individual bolt-operating means, substantially as set forth.

3. The combination with a theater a similar building having a plurality of doors in opposite walls thereof and on different floors, of pneumatic means for operating the bolt of each door, a source of fluid-pressure, a main pressure-line connected with said source and extending lengthwise along one side of the building and vertically to the uppermost of the floors included in the system, a supplemental pressure-line extending along said main line for supplying the pneumatic bolt-operating means on that side of the building, an extension of said supplemental line arranged along the opposite side of the building for supplying the pneumatic operating means of the corresponding door-bolts, connections between said main and supplemental lines located in the lower front and rear parts of the building and on the upper floors thereof, controlling-valves in said connections, and branch pipes leading from said supplemental line and its extension to the several bolt-operating means of the system, substantially as set forth.

Witness my hand this 27th day of April, 1905.

CHARLES A. CRIQUI.

Witnesses:
O. F. GEYER,
E. M. GRAHAM.