

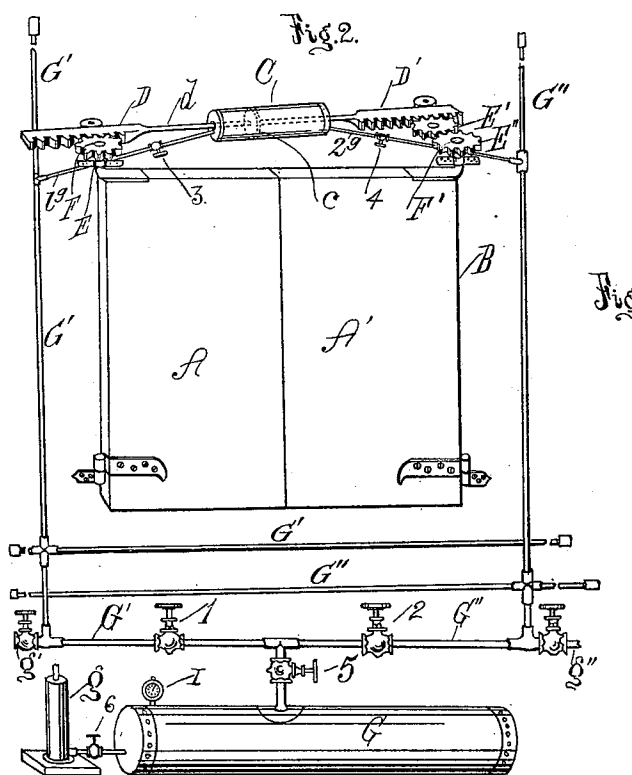
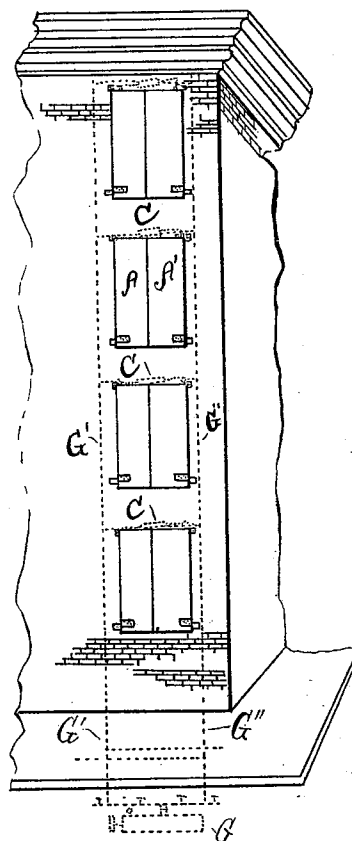
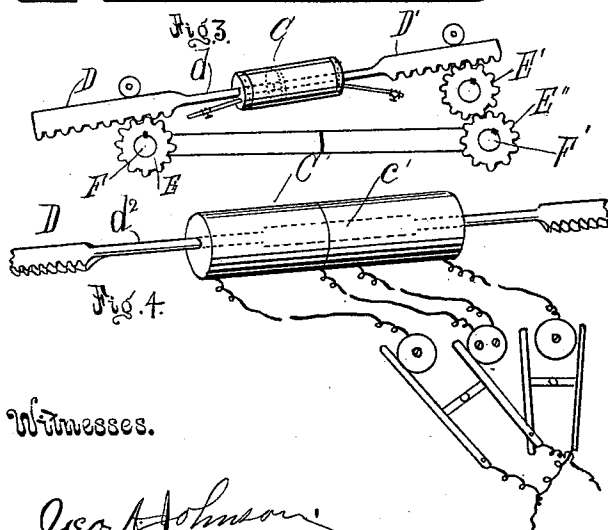
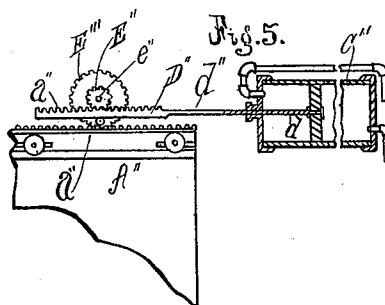
No. 615,194.

Patented Nov. 29, 1898.

J. PARKINSON.
SHUTTER OPERATING SYSTEM.

(Application filed June 4, 1898.)

(No Model.)



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN PARKINSON, OF LOS ANGELES, CALIFORNIA.

SHUTTER-OPERATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 615,194, dated November 29, 1898.

Application filed June 4, 1898. Serial No. 682,599. (No model.)

To all whom it may concern:

Be it known that I, JOHN PARKINSON, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Shutter-Operating System, of which the following is a specification.

Primarily the object of my invention is to provide practicable means for protecting the external openings of buildings in case of fire; but my invention can be applied for the simultaneous opening and closing of the shutters for any of the openings in a building.

In providing a practicable fire-shutter system for the protection of buildings against danger from adjoining or adjacent burning buildings various conditions are to be considered, viz: First, it is necessary that the apparatus be always in perfect condition for instantaneous use; second, the entire system must be under the control of a single individual at some convenient station and so arranged that the shutters can be instantly operated with slight expenditure of strength by any authorized person; also, any liability or danger of blocking the system must be avoided; third, the apparatus should be concealed from view, so as not to disfigure the building, and it should be entirely protected from the action of the fire and of the elements and against any tampering by unauthorized persons; fourth, it must be so devised that the station from which it is to be operated can be accessible while the endangering fire is in progress; fifth, it must be so constructed that it can be applied for the protection of a taller building with openings above a lower adjacent building and at the same time the above conditions all preserved; sixth, it is of great importance that any and every shutter shall be capable of being opened from the outside and from the inside of the building independently by any person, fireman, or occupant of the building, so that when the shutters are closed from the central station the persons within the building can push open the doors to get out or a fireman or other person can pull or push them open to get in or out, and in either case the door will immediately automatically close itself when released, thus keeping the fire in or out, as required; seventh, the system should be adapted to the operation of pivoted shutters as well as slid-

ing shutters, and must positively operate the shutters to open them as well as to close them.

I am aware that various devices have been heretofore proposed for the purpose of filling some of the above-mentioned requirements; but, so far as I am aware, no fire-shutter system operated from a single station has yet been devised which is practicable for use on tall buildings, and, furthermore, so far as I am aware, no system heretofore proposed has fulfilled all the above requirements. For example, all the fire-shutter-operating systems heretofore proposed have been so exposed to either internal or external fires that they are very liable to become inoperative in case of fire. The mechanisms employed are necessarily so cumbrous that it is not within any man's strength to operate any extensive system. The parts are so arranged that the whole system is blocked in case of any disarrangement of any of the parts. When the shutters are closed, they cannot be opened independently from within the building.

The object of my invention is to devise a fire-shutter system by which all the above-mentioned advantages are gained and all the objections are avoided. I accomplish this object by the means herein described and claimed. In my system the operative parts are incased in the walls of the building.

My invention embraces a fire-shutter system comprising a source of power—such as, for instance, an electric generator or an air-compressing apparatus, independent motors, one at each of the openings to be protected and operatively connected with the shutter or shutters of its opening to open and close the same positively, two main power-conductors leading from the power source and provided with branches respectively connecting with the motors, respectively, the branches from one main being arranged to apply power to drive the motors in one direction and those of the other main being arranged to apply power to drive the motors in the other direction, and mechanism at a station for applying the power through one of the mains and exhausting it through the other main, and vice versa. The motors used may be any form of air-motor or electric or other motor adapted for the purpose.

In the accompanying drawings I have

shown an air-motor and also an electric motor.

This invention can be applied to close all shutters and fire-doors exterior and interior throughout a building or a number of buildings simultaneously; but in ordinary use it will probably be found most desirable to have a separate system of conductors for each side of the building or even for each floor; but the power can be controlled at any desired point, preferably a central point conveniently accessible to the janitor or overseer of the building.

My invention also includes various features, parts, and combinations herein described and claimed.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation of a building provided with my invention. Fig. 2 is a fragmental perspective view illustrating my invention in detail. Fig. 3 is a plan of the engine and its connections. Fig. 4 is a detached view of a solenoid which serves as the shutter-operating motor in the case of an electrical system. Fig. 5 illustrates the application of my invention to a sliding door.

A A' indicate swinging shutters for closing an opening B of the building.

C indicates in a general way a motor for operating a rack D, which meshes with and turns the gearing or pinion E, which is fastened to the shutter A coaxial with the hinge-pivot F thereof. These shutters, of whatever construction, constitute protecting devices for the various openings.

G indicates a source of power, being in the instance illustrated in Fig. 2 an air-tank supplied from an air pump or compressor *g*.

G' G'' indicate two power-conducting mains which are each coextensive with the system to be operated, and each is provided with branches, as 1^s and 2^s, whereby each motor is connected with each main. In each instance a branch 1^s applies power to operate its motor in one direction, and all the branches 1^s of the main G' apply the power to all the motors to operate them all in one direction. The branches 2^s of the main G'' respectively apply the power to all their respective motors to operate them in the opposite direction. Each of the main conductors is provided with suitable exhaust, as the valved exhaust-pipe *g'* for the main conductor G' and the valved exhaust-pipe *g''* for the main conductor G''.

1 and 2 indicate valves for turning power onto the mains G' G'', respectively, and for respectively cutting the power off from said mains.

g' *g''* indicate valved exhausts for the mains G' and G'', respectively.

It is to be understood from Fig. 1, which is fragmental, that the two mains G' and G'' are coextensive with the system of shutters and that each motor of the system has two branch conductors, one being connected with

one main power-conductor to operate the motor one way and the other connected with the other main power-conductor to operate the motor the other way, as indicated in the fragmental detail Fig. 2.

In order that the motors may be readily concealed in the lintel or sill for the operation of the pivoted shutters, each is composed of an operative part, as a piston-head *c* or an armature *c'*, fastened to the middle portion of a shutter-operating bar *d* and contained within a fixed part, such as the cylinder C or solenoid C', through which the bar extends, so that the motor lies between the shutter-operating parts of the bar and is therefore brought into the space adjacent the openings and between the pivots to be rotated.

3 4 indicate two valves in the branches 1^s and 2^s, respectively, to turn the air-pressure off of the motor at any opening without manipulating the centrally-arranged valves 1 2.

For simultaneously opening two swinging shutters, as indicated in the drawings, the rack-bar *d* is provided at each end with a rack. The rack D' meshes with the pinion E', which meshes with pinion E'', which is fastened to the shutter A' by the pivot-pin F', the purpose of the intermediate gear being to drive the pinion E'' to open the shutter A' at the same time that the pinion E is driven by the rack D to open the shutter A. This construction provides for the direct operation of the shutters, and yet avoids unsightly projecting parts and allows the rack to be wholly chambered within the wall behind the shutters.

The motor for each window will be located at any suitable place either beneath the sill of the window or door or above the top thereof. In the drawings I have shown the engines located above the top of the window.

C' indicates a solenoid, and *d*² indicates the rack-bar for the solenoid. This is provided with the armature *c'*, and the reversal of the current through the solenoid will throw the armature from one end of the solenoid to the other end thereof, thus to operate the pinions to open or close the shutter.

I is a pressure-gage to indicate the pressure of air in the tank.

In practice the valves 1, 2, 5, and 6 at the compressed-air tank will ordinarily be kept closed. When it is desired to open the shutters, the valves 1 and 5 will be opened, thus throwing the air-pressure onto the motor to drive the pinion *c* to the right, thus throwing the shutters open. To close the shutters, valve 1 is closed, exhaust *g'* is opened, and valve 2 is then opened, thus allowing the air from the compressed-air tank G to flow through the pipe G'' to return the piston *c* to the left, thus to operate the motor to close the shutters.

In Fig. 5, C'' indicates a motor with piston-rod *d''*, having a rack D'' at the end thereof to drive a pinion E'', which is fixed to a shaft *e''*, which drives a cog-wheel E''', which drives

a rack *a'* on the sliding door *A''* to operate the door.

In case of fire the janitor or other attendant can turn on the power and simultaneously operate the whole system of motors to positively close all the shutters in the system, but without any danger of preventing the escape from the building of any one who might wish to pass through a window or door, because the shutters are held only by the force of compressed air or magnetic attraction, which could be overcome by the person wishing to open the shutter, and the shutters would again close as soon as released. A reverse operation of the controlling mechanism will operate the system of motors to simultaneously open all the shutters.

In practice the pivot-pinions are provided with teeth for only about two-thirds of their periphery.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A system for operating a shutter or shutters at a series of openings consisting of a protecting device at each opening, an operating-motor at each opening connected with and adapted to control the protecting device and means located at a common point or station for operating the several motors at the several openings simultaneously and positively in either direction whereby to positively open or close the protecting devices.

2. A system for operating simultaneously a series of protecting devices, consisting of an independent motor located at or near each opening, a main source of power for supplying the independent motors and maintaining a pressure therein, each motor capable of opening and closing the protecting device or devices without locking them, and means located at a common point for operating the several motors.

3. The herein-described system for operating simultaneously a series of shutters consisting of a protecting device located at each opening, a main source of power, an independent motor for each individual opening, in communication with and receiving power from the main source of power, the several independent motors connected with the protecting devices of the several openings whereby the individual protecting devices may be opened and will be caused to automatically resume their closed position without interference with the remaining protecting devices, and means located at a common point for operating the several motors.

4. The herein-described system for operating simultaneously a series of shutters, consisting substantially of a protecting device for each individual opening, an individual motor for each opening to be closed, means of communication between the several motors and a main source of power, said means incased and concealed in the structure where-

in the openings are formed and means located at a common point for operating the several motors.

5. The herein-described system for operating simultaneously a series of shutters, consisting of a protecting device or devices for the several openings to be closed, a main source of power, an individual and independent motor for each individual opening, a system of connections from each end of the motor to the main source of power capable of being utilized for the direct and exhaust respectively, pressure being maintained in the independent motors whereby individual passage-way may be opened independently of the others and will be automatically closed upon the release of the protecting device or devices, and means located at a central point for operating the several motors.

6. The herein-described system for operating a series of shutters, consisting of a protecting device or devices for each of the several openings to be closed, a main source of power, an individual and independent motor for each of the several openings, a system of pipes leading from the main source of power to each end of each motor-cylinder through which the actuating medium from the main source of power may be made to pass in either direction to apply positive pressure to open or close the protecting devices simultaneously, the resistance of the piston in each motor being maintained whereby any individual protecting device or devices for a single opening may be passed without interfering with the others and will automatically resume a closed position when released.

7. A system of fire-shutters for the openings of a building, individual operating means for each opening for controlling the shutters therefor, a main source of power for supplying said operating means, means located at a common point for simultaneously operating each individual means, and the connections between the main source of power and the individual operating means incased within the masonry or structural part of the building.

8. In a building, the combination of a system of shutters arranged in sets of two shutters each and each of said shutters provided with a pinion coaxial with its hinge, a system of independent engines, an engine being provided for each set of shutters and having a rack-bar with a rack on each end thereof, one of said racks meshing with one of said axial pinions and an intermediate pinion meshing with the other rack and with the other of said axial pinions, a common source of power for the system of engines, a system of power-conductors leading from said power source to operate the engines to drive the racks simultaneously in either direction, an exhaust for each system of conductors, and means for turning on and off the power through said systems alternately as set forth.

9. A fire-protecting system for buildings

comprising a central source of power, protecting devices at the various openings of a building to be protected and power-conductors connecting the central source of power
5 with the means for operating the protecting devices, such power-conductors inclosed in the structural parts of the building either in whole or in part, and central means for simultaneously operating the several individual protecting devices.

JOHN PARKINSON.

Witnesses:

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