

No. 728,456.

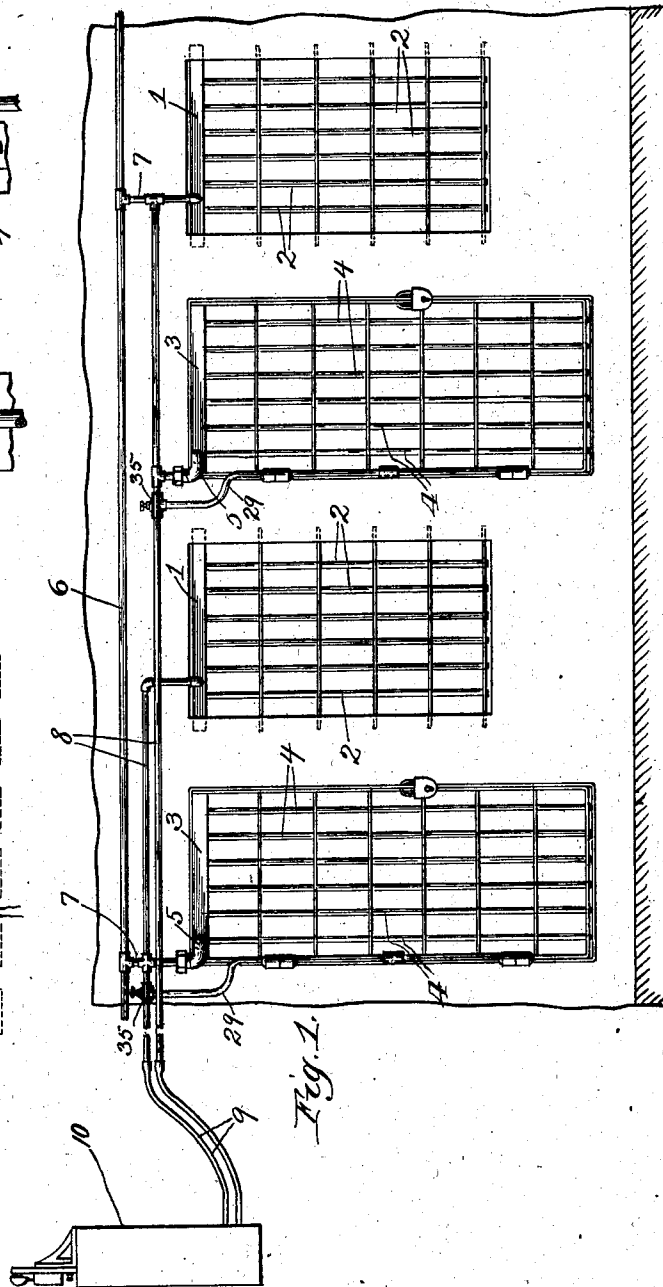
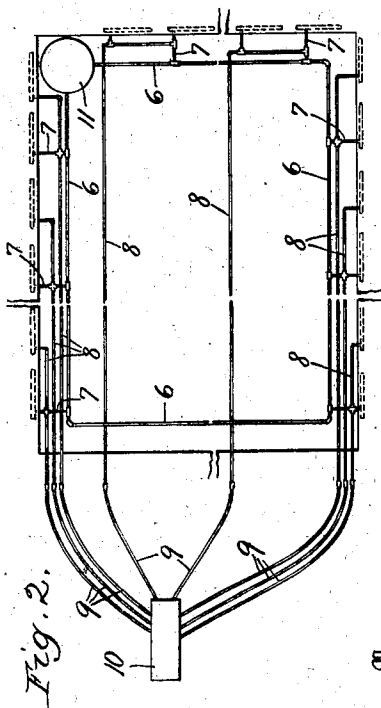
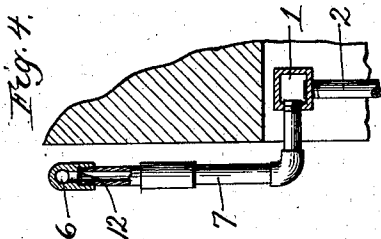
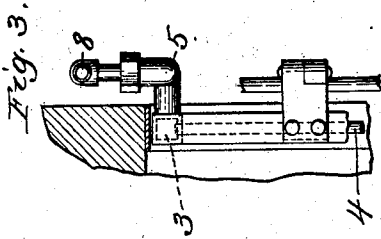
PATENTED MAY 19, 1903.

P. H. GORMAN.
CELL GRATING.

APPLICATION FILED MAY 18, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

Edward T. Wray.
J. W. Wistuland.

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Patrick H. Gorman
by Burton Burton
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No. 728,456.

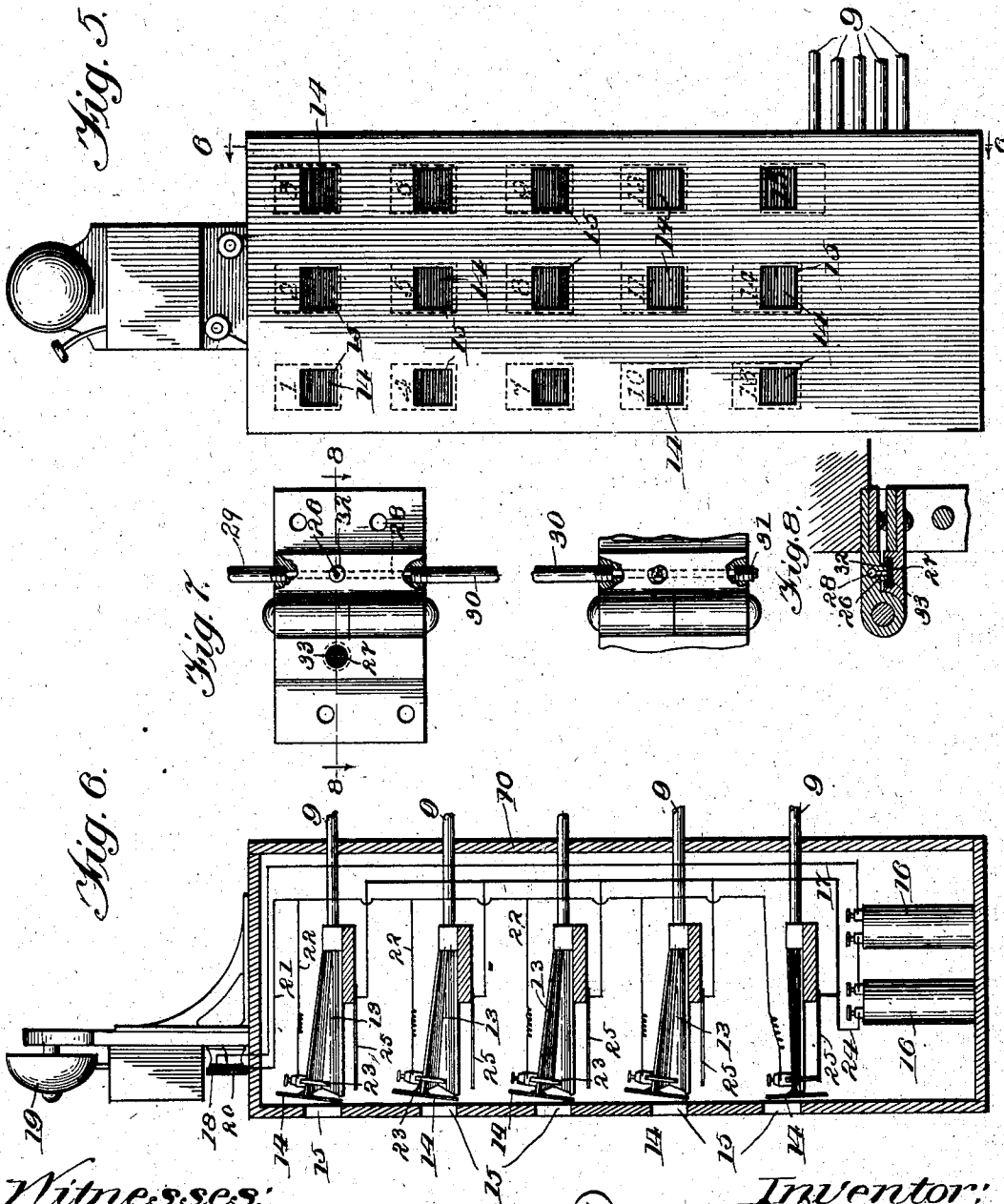
PATENTED MAY 19, 1903.

P. H. GORMAN.
CELL GRATING.

APPLICATION FILED MAY 16, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

PATRICK H. GORMAN, OF CHICAGO, ILLINOIS.

CELL-GRATING.

SPECIFICATION forming part of Letters Patent No. 728,456, dated May 19, 1903.

Application filed May 16, 1902. Serial No. 107,700. (No model.)

To all whom it may concern:

Be it known that I, PATRICK H. GORMAN, a citizen of the United States, and a resident of Chicago, Illinois, have invented certain new and useful Improvements in Cell-Gratings, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide a grating for a window or door which cannot be tampered with by cutting or breaking the bars without causing an alarm to be given.

It consists in features of construction which are set out in the claims.

In the drawings, Figure 1 is an elevation of a portion of the wall of the corridor from which cells open, showing the grated openings—doors and windows—of two adjacent cells. Fig. 2 is a diagrammatic view showing the communication from the hollow bars of the cell-gratings to the alarm-indicator and to the source of air under tension. Fig. 3 is a detail section of the swivel connection of a hinged grating or door with the air-pipe. Fig. 4 is a detail section axial with respect to the air-pipe main and branches therefrom to one cell and to the indicator, showing a minor feature of construction at that point. Fig. 5 is a front elevation of a signal and alarm adapted to be operated by the system shown in the other figures. Fig. 6 is a section at the line 6 6 on Fig. 5. Fig. 7 is an elevation showing the hinges of a cell-door adapted for my invention partly broken away to show the air connections. Fig. 8 is a detail section across a folded hinge of the form shown in Fig. 7, as at the line 8 8 on said Fig. 7.

In the drawings, 1 is a hollow frame-bar of a fixed cell-grating, as for closing a window-opening.

2 2 2, &c., are the hollow vertical bars of the grating, joined to a hollow frame-bar 1 and having their cavities communicating with the cavity of the latter.

3 is the upper horizontal bar of the grating of a cell-door, 4 4 4 being the hollow vertical grating-bars of such door, having their cavities communicating with that of the upper frame-bar.

5 is a hollow lug joined to and having its cavity communicating with that of the upper frame-bar 3.

6 is a main air-pipe leading from a source of compressed air represented by the tank 11. This air-pipe may be arranged so as to form a closed circuit from the tank around past all the cells and back to the tank; but this is not material. From this air-main connection is made by service-pipes 7 7, &c., with the hollow frame of each of the cell-gratings, from which or with respect to tampering with which separate indication of alarm is desired. Usually it will not be material or necessary to indicate separately whether it is the door or window of a given cell which is being tampered with. Therefore usually all the openings—doors and windows—of each cell may have their grating-frames connected by a single pipe, which may be called the "local" air-pipe 8, into which connection is made by means of the connecting service-pipe 7, leading from the air-main. From the service-pipe 7, pertaining to each cell or opening to be protected by alarm, a small pneumatic duct 9 leads to the pneumatic indicator and alarm-box 10, located at any convenient point for the custodian. The construction of this pneumatic indicator and alarm-box is hereinafter described in detail. For the present it may be noticed simply that it comprises an alarm-bell 19 and a face with openings 15, through which the numbers of the several cells may be made to appear when the proper pneumatic devices are operated by reason of the breaking or puncturing of the grating of any cell, causing the air to be vented through the duct pertaining thereto, the bell being arranged to be sounded whenever any number is thus exposed.

From the foregoing description it may be understood that the tank 11 has its contents maintained at any proper tension by any suitable means to produce a condition of abnormal or non-atmospheric tension in all the passages which are in communication with it. This may be a tension below atmospheric, produced by rarefaction or exhaustion in the tank 11 or above atmospheric pressure produced by compression or generation of gas in the tank 11. The method I prefer to produce tension above atmospheric in the tank 11 is by generation of carbonic-acid gas by the means and in the manner commonly employed for generation of such gas for soda-water

fountains and the like; but the means of producing this tension, whether it be air or other gas that is thus stored under pressure, is immaterial. I have, however, illustrated the details of the device as they should be for the purpose of utilizing tension above atmospheric rather than below in this tank. It will be understood that whenever any bar of the grating connected in the manner described with such tank and with the pneumatic indicator and alarm is punctured, so as to permit the escape of the air or gas under higher tension than atmospheric, the tension in all the passages leading from such punctured bar to the indicator and alarm will become atmospheric, and said indicator devices will be operated and the alarm sounded. The swivel connection of the frame of the door with the air system prevents the movement of the door when operating on its hinges from interfering with the tension or breaking the connection, the axis of the swivel-joint being in line with the axis of the door hinge or hinges.

In order that an alarm may be given in the same manner upon any unauthorized attempt to open the cell-door, either by turning it on its hinges or by tampering with it, I make the hinges as illustrated in Figs. 7 and 8, one leaf of one hinge, and preferably of both, having a duct 26, opening toward the opposite leaf with the hinges closed and from such duct a passage leading to the pipe 8, the other leaf of the hinge having a disk 27, of rubber or leather or like substance, suitable to act as a stopper to close the mouth of the duct 26 when the hinge is folded, as at the closed position of the door. The passage from the duct 26 to the pipe 8 may be made by a duct 28, formed vertically through the leaf, having said duct 26 and a pipe screwed into the end of said duct 28 at the top of the upper hinge, and a pipe 30, extending between the two hinges, the lower end of the duct 28 in the lower hinge being closed by a plug 31. Preferably the duct 26 is made to emerge at the crest of a boss 32, formed on the hinge-leaf, and the disk 27 may in that case be set at the bottom of a recess 33, formed in the opposite leaf, such recess being deeper than the thickness of the disk, so that the boss 32 intrudes into the recess in order that it may reach the disk to cause the disk through its crest to be closed. This construction prevents the introduction of any thin blade between the boss and disk by which the duct might be held closed while the door was open. Preferably the disk is made in the member of the hinge which is fixed to the casing and the stopper carried by the member fixed to the door, since this obviates the necessity of providing a flexible connection with the pipe 8. A valve 35 is preferably interposed to control the pipe 29, so that when an authorized person is to open the cell-door the valve will be closed to prevent giving an alarm upon such opening.

In order that the breaking of a bar in one

cell may not vent the ducts leading from all the cells to the indicator-box and so cause confusion in the indication, I interpose in the connection between the service-pipe 7 and the air-main a gasket 12, having a fine puncture which controls the passage of air into the main from the cell to which the service-pipe leads. The amount of air which can pass through this puncture is not enough to materially affect the tension of the main or of the tank 11, and therefore not enough to cause any action of the signals or alarms of the other cells; but the aperture is sufficient, nevertheless, to permit the tension of the air main and tank to be transmitted by exhaustion to the passages of the cell grating and duct therefrom to the alarm-box whenever there is no leak, as there should not be except in case of tampering.

It will be manifest that the same expedient and substantially the same structure above described may be employed to guard openings other than doors and windows of cells for the purpose of preventing unauthorized intrusion, thus serving as a burglar-alarm for any opening which may without interfering with its ordinary purpose be grated so closely as to require the rupture of one or more bars in order to admit a person. I do not intend to limit myself to the use of the device merely to prevent escape through an opening, but intend to include equally its use to prevent intrusion through an opening which may be guarded by such device.

The particular form of pneumatic indicator and alarm which I have shown may be described. The ducts 9 from all the cells lead into the indicator-box 10, each duct communicating with a little bellows or "pneumatic" 13, which is mounted in the box, with its oscillating end toward the apertured front of the box, and vibrating side of each pneumatic carries a shutter and number-plate 14, upon which there is inscribed at the aperture a number corresponding to the number of the cell with which the pneumatic is connected by the duct 9. This number is concealed when the pneumatic is inflated, and its oscillating side is thereby upheld, the lower portion of the shutter 14 in this position showing blank through the aperture 15. Whenever the tension in any duct and pneumatic becomes atmospheric by reason of a rupture in the cell-grating with which it is connected, the pneumatic collapses and exposes its number through the aperture. An electric circuit is constructed in the indicator-box, comprising the generating-cells 16 16, a circuit-wire 17, running from one pole to a binding-post 18 on the alarm-bell 19, while from the other binding-post 20 the wire 21 extends, branches 22, &c., to the contact-pieces 23, mounted on the oscillating elements of the pneumatics 13, respectively, and the wire 24. From the other pole of the battery extend branches to the contact-pieces 25, &c., mounted in position to be struck by the contact-

pieces 23 of the respective pneumatics when such pneumatics are collapsed. Thus whenever any one pneumatic is collapsed the circuit is completed through the bell, and it is sounded, calling the attention of the attendant to the fact that some cell has its grating punctured, the exposed number indicating which cell it is.

I claim—

1. A cell-grating comprising hollow bars; a source of air under tension; an air-main leading from said source; a service-pipe leading from the main to the grating-bars; a pneumatic alarm and operating means therefor, the latter having its communication with the main restricted relatively to its communication with the frame-bars and with the alarm-operating means.

2. A cell-door comprising a hollow frame-bar and hollow grating-bars joined and communicating therewith; a hollow lug extended from the frame-bar; a source of air under tension; a pipe leading therefrom, mounted fixedly on the wall which the cell-door closes, and a hollow swivel-joint between the lug and said pipe, the axis of the swivel being in line with the axis of the door-hinges; an alarm, and operating means therefrom communicating with said pipe.

3. In combination with a source of air under tension, an alarm and means for operating the same; a door having a hinge whose members have one a duct and the other a stopper for the duct in position to close it when the hinge is in position corresponding to closed position of the door; an air-pipe leading from the duct to the source of compressed air and also to alarm-operating means.

4. In combination with a source of air under tension, an alarm and means for operating the same; a door having a hinge whose

members have one a duct and the other a stopper for the duct, in position to close the latter when the door is closed; an air-pipe leading from the duct to the source of air under tension and to the alarm-operating means, the duct being in the hinge member which is fixed to the casing and the stopper being in the member which is carried by the door.

5. In combination with a source of air under tension an alarm and means for operating the same; a door having a hinge whose members have one a duct and the other a stopper for the duct in position to close the latter when the door is closed; and a pipe leading from the duct to the source of air under tension and to the alarm-operating means, the two hinge members having one a boss and the other a recess which receives the boss when the hinge is closed, the duct and stopper being arranged to meet at the crest of the boss within the recess.

6. In combination with a grating comprising hollow bars, a source of air under tension with which the cavities of the bars are in communication; an alarm and operating means for the same comprising a pneumatic or inflatable and collapsible chamber; an indicator carried by the movable wall of such pneumatic; an electric circuit comprising the alarm device which is opened and closed by the movement of said movable element; a duct in communication with the cavities of the bars and leading to the pneumatic.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 6th day of May, A. D. 1902.

PATRICK H. GORMAN.

In presence of—

CHAS. S. BURTON,

I. W. WESTERLAND.