No. 627,037. Patented June 13, 1899.

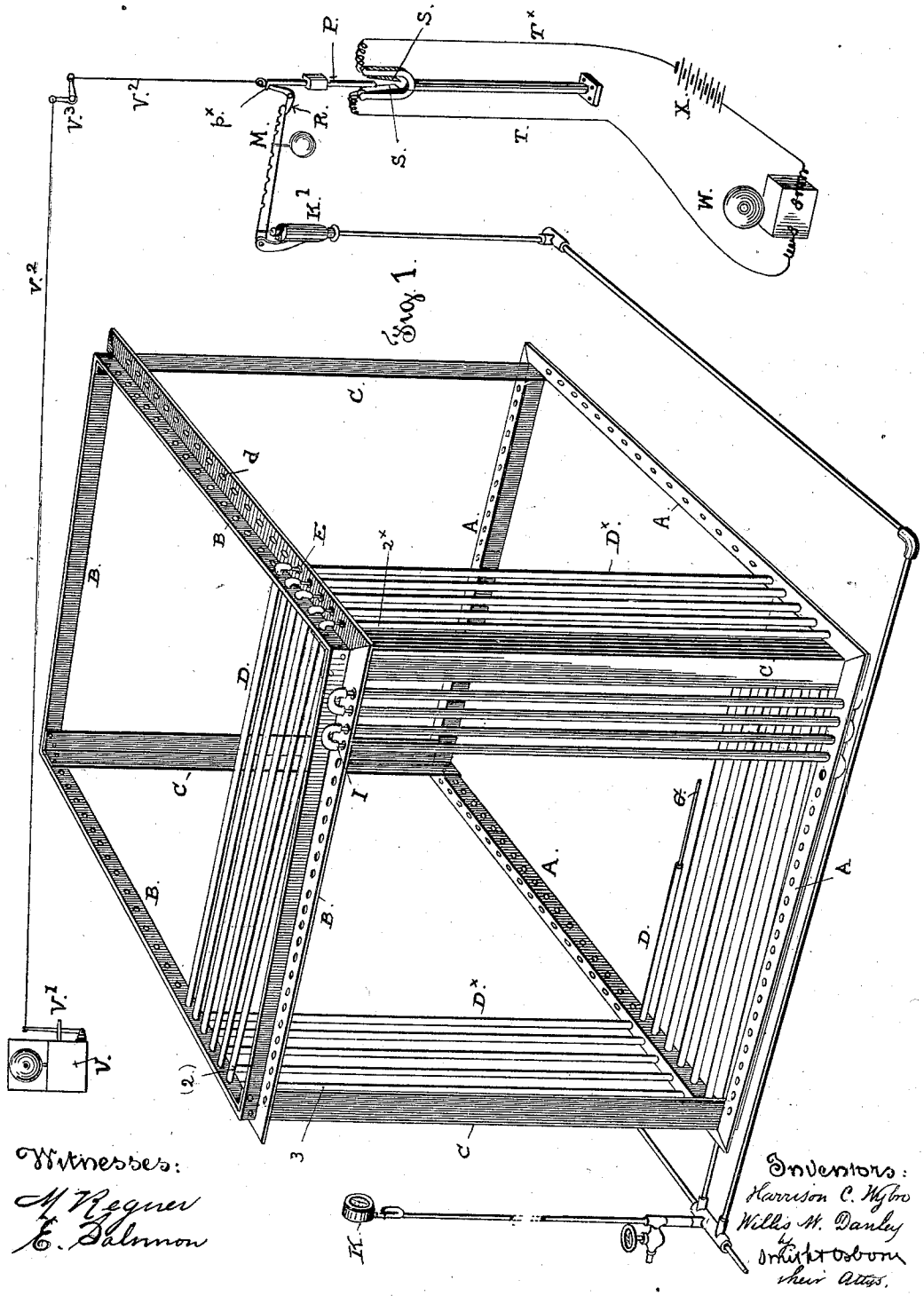
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ALARM MECHANISM FOR BANK VAULTS OR PRISON CELLS.

(Application filed Mar. 10, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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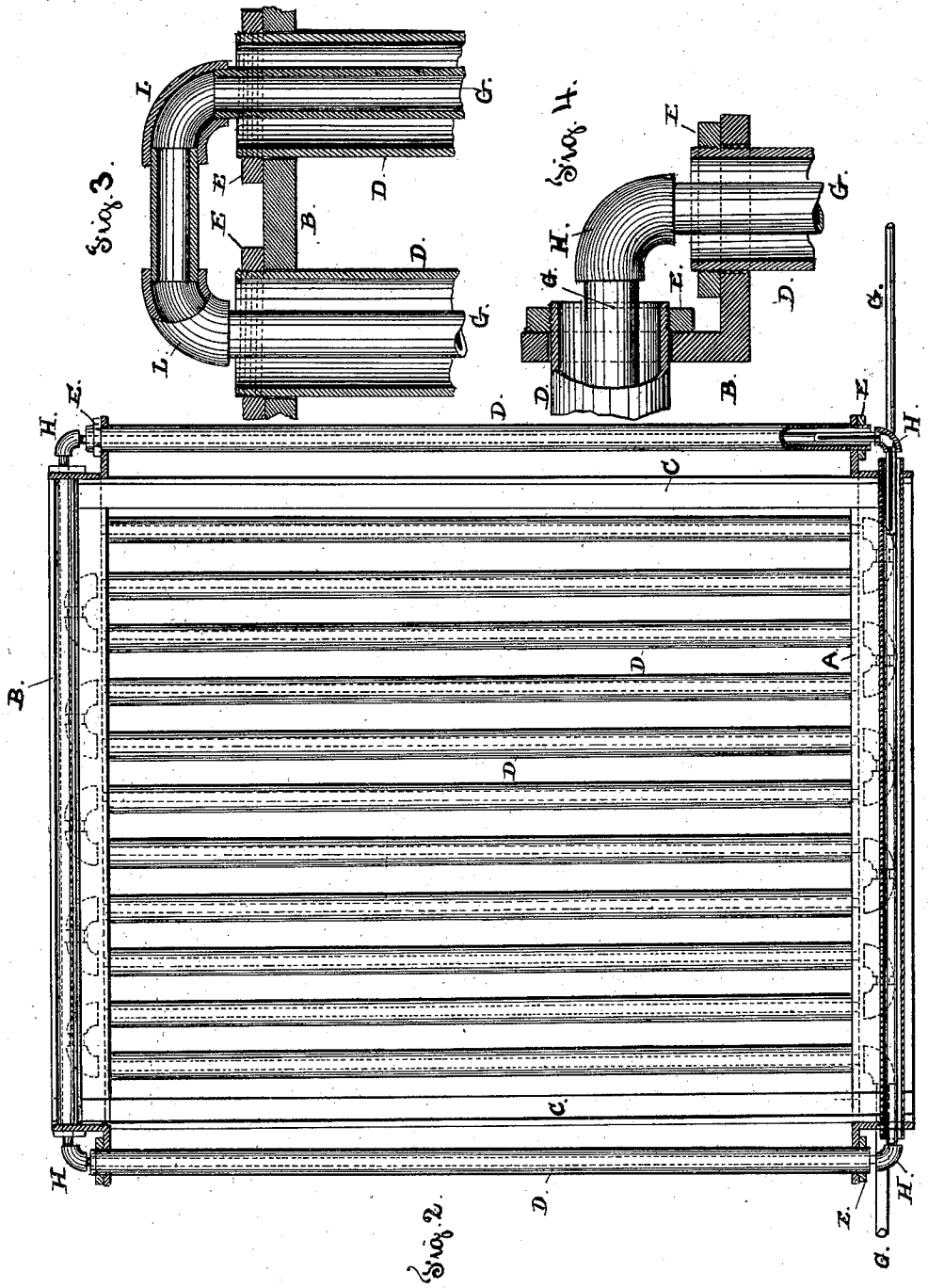
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UNITED STATES PATENT OFFICE.

HARRISON C. WYBRO, OF SAN FRANCISCO, CALIFORNIA, AND WILLIS W. DANLEY, OF CHICAGO, ILLINOIS; SAID WYBRO ASSIGNOR TO THEOPHILUS C. DODGE, OF SAN FRANCISCO, CALIFORNIA.

ALARM MECHANISM FOR BANK-VAULTS OR PRISON-CELLS.

SPECIFICATION forming part of Letters Patent No. 627,037, dated June 13, 1899.

Application filed March 10, 1898. Serial No. 673,406. (No model.)

To all whom it may concern:

Be it known that we, HARRISON C. WYBRO, a resident of the city and county of San Francisco, State of California, and WILLIS W. DANLEY, a resident of Chicago, county of Cook, and State of Illinois, citizens of the United States of America, have invented certain new and useful Alarm Mechanism for Bank-Vaults or Prison-Cells, of which the following is a specification.

Our invention relates to improvements made in the construction of protecting gratings or framework formed of tubes or pipes coupled together surrounding the space, room, or object to be protected and suitably charged or filled with air, gas, or liquid under pressure in such manner that a reduction in the pressure produced by cutting or breaking any pipe or pipes of the grating or guard is made to sound an alarm by operating or setting in motion a signal device.

The present improvements are designed more especially for the construction of close walls or partitions for surrounding vaults and other receptacles for the safe keeping of valuables and for the construction of prison-cells or rooms for confining criminals; but they are also adapted for use in the construction of gratings for windows and other openings.

To such ends the improvements consist in a novel construction of protecting-grating composed of air-tight tubes or pipes of relatively small diameter adapted to hold air or gas under pressure and tubes or pipes of larger diameter surrounding, covering, and concealing the air-charged tubes, the said protecting tubes or pipes being open at the ends or not charged with air and being out of contact with the air-charged tubes inside; also, in combination with the interior air-charged tubes, an alarm device adapted to be set in operation to give an alarm when any one or more of the interior tubes shall be cut into or broken to allow the escape of the air or gas therein.

The following description explains at length the nature of these improvements and the manner in which we proceed to construct, apply, and carry out the same, reference being had to the accompanying drawings, representing a construction of protecting grating or framework and an alarm mechanism for a bank-vault or a cell in accordance with our invention.

In the said drawings, forming part of this specification, Figure 1 is a representation in perspective of a skeleton framework to surround and inclose the top, the bottom, and the sides and ends of a vault or a room, showing also the alarm-signal mechanism connected with the air-charged tubes. Fig. 2 is a vertical cross-section on an enlarged scale, the section being taken in a plane parallel with the front side of the framework. Figs. 3 and 4 are sections, on an enlarged scale, showing in detail the manner of coupling and connecting the air-carrying tubes.

The framework for a vault is constructed of spaced tubes to inclose a vault on all sides, the same consisting of skeleton frames of angle-iron composed of horizontal sills A A, laid on the bottom and bolted together in a rectangular shape, and similar horizontal header-bars B B for a top frame. These two frames are joined together and supported by uprights C C, of angle-iron, set at the corners, and the whole is strongly bolted together.

Through the horizontal members and through the vertical members of the angle-iron holes *d d* are punched to admit the ends of straight tubes or pipes D, and the ends of such pipes being threaded for hollow nuts or threaded rings E the same are inserted in the holes of the angle-irons and secured by placing the nuts E on the threaded ends and screwing them down against the angle-iron. These tubes D are of uniform length, open at both ends, and they are set in parallel order at proper intervals of distance apart to prevent a person from passing between two tubes or from introducing any portion of his body through the spaces between the tubes. At the top and bottom ends the tubes D D are confined in a rigid manner, and the body of the tube is of sufficient thickness and of suitable strength to prevent the tubes from being sprung apart when in place. Through these tubes are carried tubes G G of smaller diameter than the tubes D, and by means of

elbows or L-couplings H and U-couplings I bends or turns are made outside the tubes D, so as to carry the smaller tubes G in a circuitous but continuous manner through all the tubes D that compose the grating on one side of the vault.

The tubes D are laid horizontally for the top and the bottom of the vault and perpendicularly for the sides and ends.

The set or series of horizontal tubes composing the top and bottom and the vertical tubes on the sides (designated, respectively, by the letters D D and $D^{\times}$ $D^{\times}$, Fig. 1) are arranged in such manner that the small tubes G can be laid and connected in a single continuous line, somewhat after the manner of a spiral, through the whole set or series of tubes D $D^{\times}$ that go to form the top and bottom and the two opposite sides of the structure. This is done by laying the tubes of the top and bottom series slightly diagonal or at an angle transversely across the frames A A and B B, so that, beginning with the first horizontal tube 2, it is laid across the top to the opposite side and set in line with the end of the vertical tube 3 on that side which stands about opposite to the second vertical tube $2^{\times}$ of the row on the side from which the start was made. In this manner a continuous line of the interior tubes can be laid through the entire set of the outer tubes D that compose the grating on the top and bottom and two sides of the structure.

The line of internal tubing for each of the remaining sides is laid in a circuitous manner through the external tubes of each side by using U couplings or joints, the tubing G being carried up through one external tube and down through the next one, and so on throughout the whole set of tubes on that side, as illustrated in Figs. 2 and 3.

All joints and connections in the line of internal tubes are made air-tight, and the end of each length or line of continuous tube is brought out to and connected with a pipe G′, laid from an air-tank or common reservoir, to which is coupled an air-pump or other suitable compressing apparatus, wherewith a uniform head or pressure of air is maintained in the tank and in all the pipes or tubes connected with it.

A pressure-gage K is provided for indicating the pressure existing in the apparatus.

To the supply-pipe of the apparatus and at some convenient point between the tank or source of air-supply and the tubes of the grating that are charged with air is connected a valve K′, regulated by a weight and lever M and kept closed by the working head or pressure maintained in the air-tubes, but arranged to open under the action of the weighted lever when the internal pressure drops below a given amount. A material reduction of the air-pressure in the system of pipes connected with the air-supply apparatus—such, for example, as would be produced by breaking or cutting one of the interior tubes at any point—will cause the lever M to drop, and the movement of that part is utilized to set in motion a single mechanism, such as an alarm-bell actuated by a mechanical striking mechanism or an electrically-operated alarm. The manner in which these two different alarms can be operated by or from the movements of the lever M will be understood from Fig. 1 of the drawings. Either or both of these alarms may be combined and arranged for operation as a part of the complete mechanism or apparatus. The same are shown and described for the purpose of illustrating a simple method of operating an alarm that is situated in the immediate vicinity of the vault or apartment to be protected, and also another style or construction of alarm that is better adapted to be worked at a distance from the vault, and one that is practically unlimited by the distance between its place of location and the vault. The construction and operation of this part of the mechanism are as follows: In proximity to the free end of the lever M a bar P is held in suspended position by a catch $p^{\times}$ and a trigger or tripping-lever R just above and in line with two separate electrodes or contact-springs S S, to which are coupled wires T $T^{\times}$ from the poles of an electric battery X or other similar source of electric energy. In this circuit is interposed an electric bell W, constructed to operate when the circuit is closed and to continue sounding until the circuit is broken. The suspended bar P is weighted, so as to drop and close the circuit across the separated contact-springs T $T^{\times}$, and thus whenever the lever M releases the bar a signal is set in motion and continues to operate until shut off. The same movement of the bar P can be utilized to operate a mechanical bell V by connecting the aforesaid bar to the releasing-lever V′ of the bell mechanism by wires and bell-cranks V^2 V^3. It will be obvious that other alarm-signals could be arranged for operation by the drop or reduction in the working head or pressure maintained in the internal tubes. As thus constructed and combined for operation no point of this grating can be cut or the air-tubes separated at any accessible point without setting off the alarm. All the joints and connections are intended to be embedded in the masonry or the material of which the vault is constructed, and thereby concealed from view.

Where the grating is applied to protect a window or similar opening or in placing the same around the walls of a cell in a prison, the tubes D D between the supporting angle-irons are left uncovered or exposed. These tubes can be arranged in rows sufficiently close together to furnish the necessary safeguard.

The construction of grating of double tubes above described enables the mechanism or apparatus to be operated with a relatively small charge or body of air and to otherwise materially lessen the cost of construction.

The air-charged tubes G can be of small diameter, as the outside tubes D furnish the requisite strength and stiffness, so that they cannot be sprung or bent, and in addition thereto the outside tubes can be of such large diameter that a large space can be filled or covered or closed in with a comparatively small number of tubes.

It will be obvious that the system of tubes can be kept charged with a noxious gas instead of with air, so that the escape of the gas at a break made in any part of the grating surrounding the walls of a vault would have an unwholesome effect on the person attempting to cut through the grating.

Having thus fully described our invention, what we claim therein as new, and desire to secure by Letters Patent, is—

1. A protecting-grating for bank-vaults, prison-cells or other situations, as described composed of spaced tubes fixed at the ends in sills or cross-beams; air-charged tubes of relatively small diameter inclosed within the outer tubes and coupled together by air-tight joints forming a continuous line of air-containing tubes; means for maintaining a constant and unvarying head or pressure throughout the said line of inner tubes; an alarm device; and mechanism connecting said alarm with the line of air-charged tubes and adapted to set the said alarm in operation by a drop or reduction in the pressure maintained in the line of inner tubes, combined for operation as set forth.

2. The combination with the air-charged tubes coupled together in a continuous system in parallel rows; of the protecting-tubes of larger diameter surrounding the charged tubes and inclosing the same, said protecting-tubes being disconnected from the inclosed tubes; means connected with the inclosed tubes for maintaining pressure in the medium confined therein, and an alarm connected with said charged tubes and adapted to be set in action by a reduction in the pressure, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands and seals.

HARRISON C. WYBRO. [L. S.]
WILLIS W. DANLEY. [L. S.]

Witnesses:
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M. REGNER.