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EXPLOSION PROOF CABINET

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FIG. 1

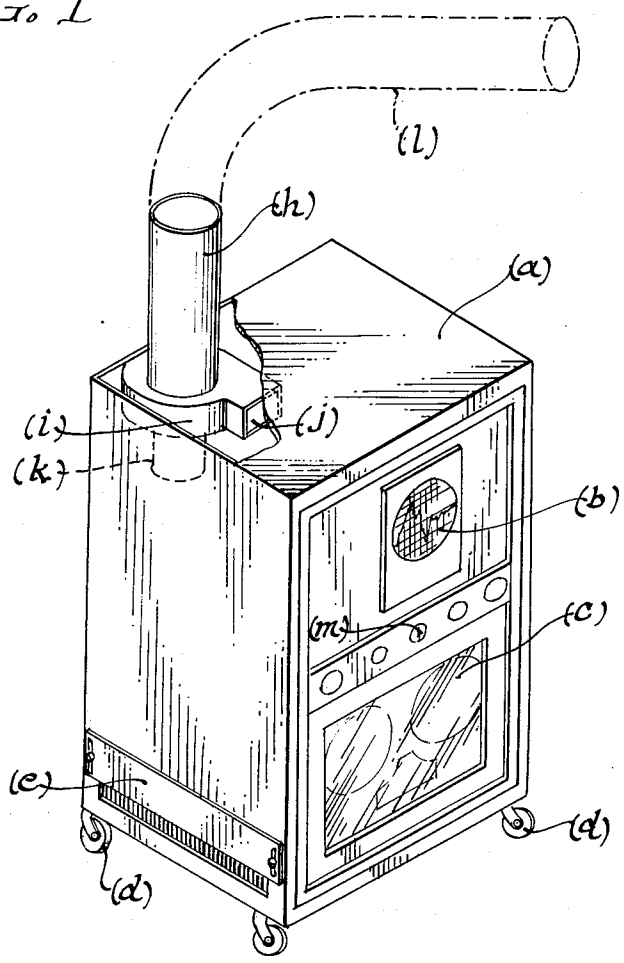
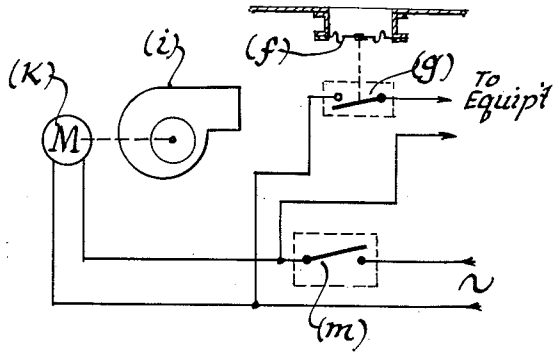



FIG. 2




Jordan D. Frasier
Harry L. Hunter
INVENTORS

BY Zabel, Baker, York
Jones & Dithmar
Attorneys

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# 3,016,813
# EXPLOSION PROOF CABINET

Jordan D. Frasier, 9115 S. Merrill, and Harry L. Hunter, 5800 Stony Island Ave., both of Chicago, Ill.

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Our invention relates to explosion proof cabinets, and as one of its uses, it is designed to prevent explosions in operating rooms. It is applicable to any circumstance where explosive fumes due to ether or other components may pollute the atmosphere to a point where an electric arc, overheated circuitry, etc. would cause an explosion. The cabinet is designed to hold electrical and electronic instruments which are under observation, such as those used during the course of an operation. These instruments may cause an arc or otherwise ignite the explosive atmosphere unless they are placed in an explosion proof cabinet such as the one herein described.

Our cabinet is designed to maintain an internal pressure greater than that of the surrounding explosive atmosphere so that the explosive atmosphere may not enter. It is provided with an intake duct which may be extended to any point where fresh air is available. A blower and other suitable instruments working in conjunction with the intake duct draw in the fresh air so as to maintain a pressure within the cabinet. In operating rooms the explosive atmosphere usually does not extend higher than five feet. In this circumstance, the intake duct may extend upward to a point higher than the presence of the explosive atmosphere.

While it might be assumed that the cabinet could be made air tight, this is impractical from the standpoint of ventilation, cost of manufacture and the difficulty in maintaining air-tight seals. Our invention circumvents the necessity of an air-tight cabinet by maintaining a pressure inside the cabinet sufficient to prevent the explosive atmosphere from seeping into the cabinet.

As a safety feature, the cabinet is provided with a diaphragm that is responsive to the pressure inside the cabinet. This diaphragm controls an electric switch which, in turn, controls the electric current supplying the electronic equipment mounted within the cabinet. This diaphragm will open the electric switch, turning off the electric current to the electronic equipment, should the pressure within the cabinet approach what is considered an unsafe level.

We will explain our invention in more detail by referring to the accompanying drawing illustrating one embodiment thereof, in which FIGURE 1, is a perspective view of our cabinet and FIGURE 2 sets forth the electrical connections for the "fail-safe" aeronoid switch device and other circuitry.

Referring more particularly to the drawings, we show a cabinet *a* within which suitable measuring and similar apparatus is placed so as to be under the observation of the attendants within the operating room or wherever said cabinet may be applicable. We indicate at *b* an oscilloscope which is one such instrument, and at *c* a tape recorder. The cabinet has suitable rollers *d* so that it may be moved easily, and has an adjustable louver *e* so that a stream of air may be permitted to pass through the cabinet, from the intake and out through the louver,



should it be desirable to maintain such a stream of air for further control of pressure or ventilation.

Inside the cabinet is diaphragm *f* which responds to the pressure within the cabinet, and which controls the switch *g*. If the pressure within the cabinet fails to a point approaching an unsafe level, the diaphragm causes switch *g* to disconnect the electronic equipment within the cabinet.

We provide an intake duct *h* through which air is drawn into the blower *i*, and then in turn, is forced into the cabinet through opening *j*. An explosion proof motor *k* is used to operate the blower.

As before explained, the intake pipe *h* extends upward to a point beyond the presence of the explosive atmosphere, so that the air drawn in through this pipe is uncontaminated air. This pipe may be extended, as shown by pipe *l*, so that uncontaminated air may be obtained from any convenient source if this is necessary.

From what has been thus described, it will be clear that we have provided an explosion proof cabinet which may be placed within an atmosphere of contaminated air, but within which a suitable pressure is maintained so that there is no seepage of contaminated air into the interior thereof. Quite obviously, modifications and changes may be made in the specific form herein disclosed, without departing from the spirit of our invention, but having thus described one form which our invention may take, we claim as new, and desire to secure by Letters Patent the following:

1. A cabinet for use in an explosive atmosphere and adapted to enclose electrically powered instruments likely to detonate an explosive atmosphere within the cabinet, said cabinet having an air intake pipe adapted to communicate with a non-explosive atmosphere and to receive and carry a predetermined air flow to the interior of the cabinet, blower means connected to said air intake pipe and establishing said predetermined air flow, air outlet means in said cabinet sized so the air flow to the interior of the cabinet through said air intake pipe results in higher air pressure inside the cabinet than outside the cabinet and thereby prevents the entrance of gases from said explosive atmosphere surrounding the cabinet, a pressure responsive electrical switch, said electrical switch mounted in the power line of any electrically powered instrument in said cabinet and set to open when the pressure in said cabinet drops to a predetermined level with respect to the pressure of the atmosphere outside the cabinet whereby the power to said electrical instruments is shut off before the entrance of gases from said explosive atmosphere.

2. The instrument holding cabinet described in claim 1 wherein the air outlet means in said cabinet comprise an adjustable louver whereby the size of the air outlet means may be varied to regulate the air pressure inside the cabinet.

3. A cabinet for use in an explosive atmosphere and adapted to enclose electrically powered instruments likely to detonate an explosive atmosphere within the cabinet, said cabinet having an air intake pipe adapted to communicate with a non-explosive atmosphere, an electric fan mounted in said air intake pipe and operable to deliver a predetermined air flow to the interior of the cabinet, air outlet means in said cabinet sized so the air

flow to the interior of the cabinet through said air intake pipe results in higher pressure inside the cabinet than outside the cabinet and thereby prevents the entrance of gases from said explostive atmosphere, a pressure responsive electrical switch inside the cabinet, said pressure responsive electrical switch mounted in the power line of any electrically powered instrument in said cabinet and set to open when the pressure in said cabinet drops to a predetermined level with respect to the pressure of the atmosphere outside the cabinet whereby power to said electrical instruments is shut off before the entrance of gases from said explosive atmosphere.

4. The instrument holding cabinet described in claim 3



wherein the air outlet means in said cabinet comprise an adjustable louver whereby the size of the air outlet means in said cabinet may be varied to regulate the air pressure inside the cabinet.

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