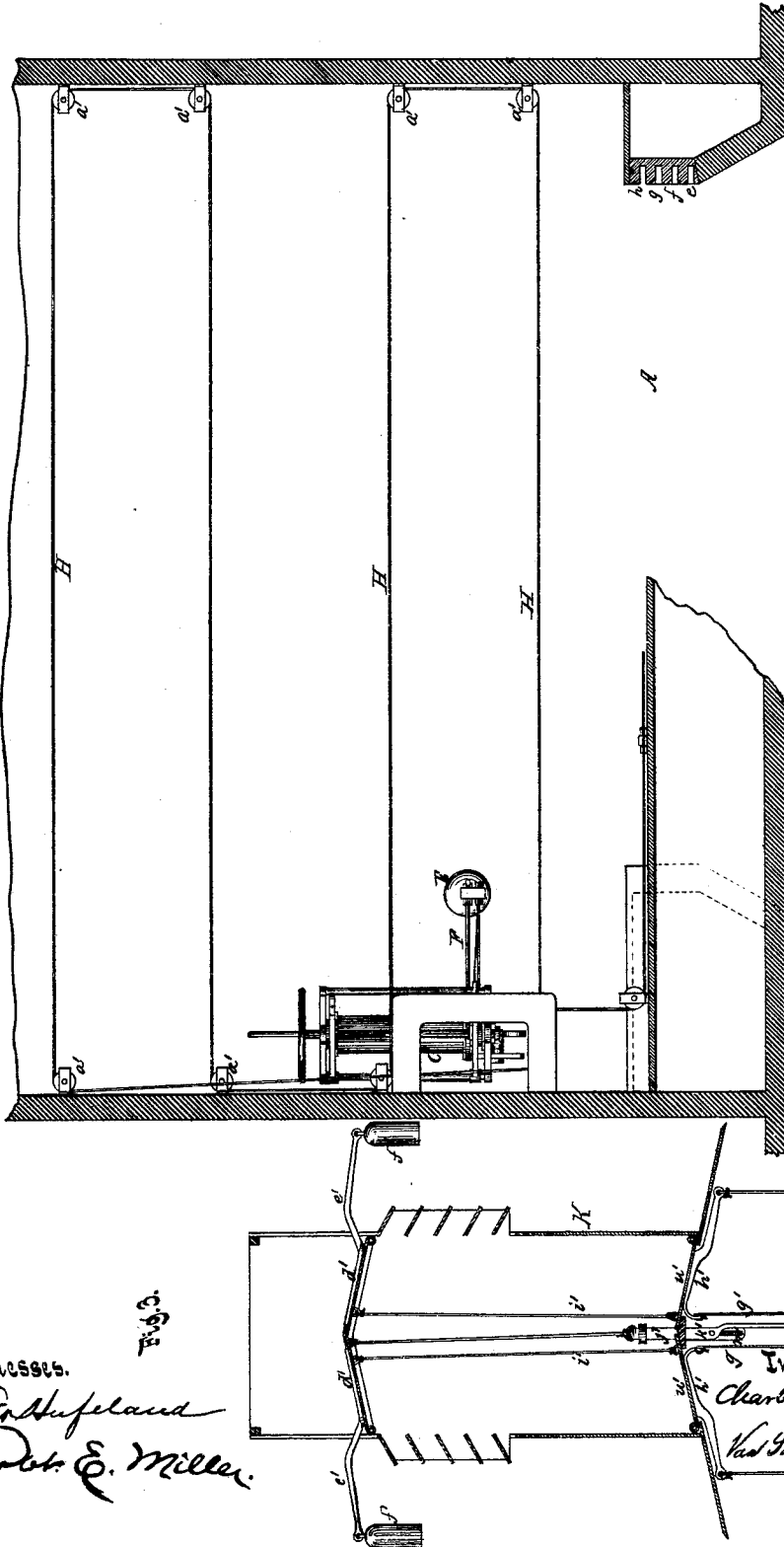


C. HOFFMANN.
THEATER-CURTAINS.

No. 188,136.

Patented March 6, 1877.

Fig. 2.



Witnesses.

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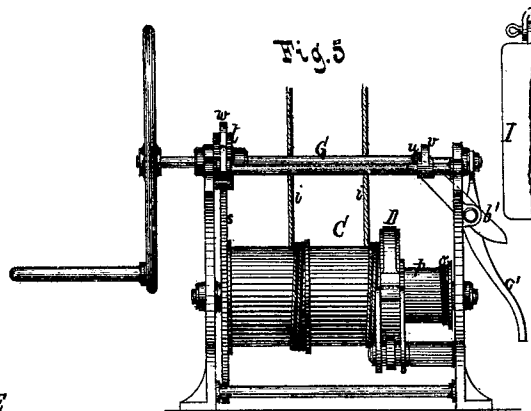
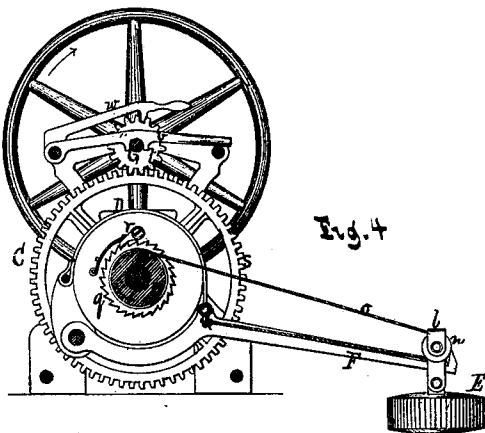


Fig. 4.

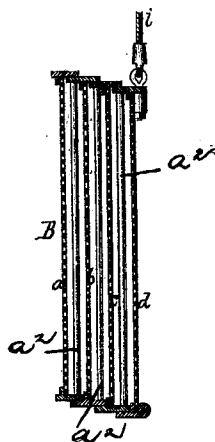
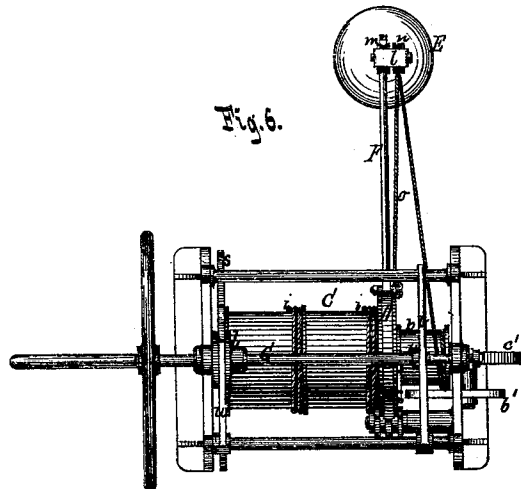


Fig. 5.



Witnesses.

Otto Hufeland
Robert E. Miller.

Inventor.

Charles Hoffmann
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UNITED STATES PATENT OFFICE.

CHARLES HOFFMANN, OF NEW YORK, N. Y.

IMPROVEMENT IN THEATER-CURTAINS.

Specification forming part of Letters Patent No. **188,136**, dated March 6, 1877; application filed February 7, 1877.

To all whom it may concern:

Be it known that I, CHARLES HOFFMANN, of the city, county, and State of New York, have invented a new and useful Improvement in Curtains for Theaters, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a transverse vertical section. Fig. 2 is a horizontal section.

The remaining figures are details, which will be referred to as the description progresses.

Similar letters indicate corresponding parts.

This invention consists in a curtain for theaters, &c., composed of frames filled with fire-proof material, and each frame being constructed with vertical rods, upon which the adjoining frames move and are guided, and each frame being arranged at its side edges in guide-grooves, the whole being combined with one or more hoisting-ropes extending from a windlass to the bottom frame of the curtain, as will hereinafter appear. With the curtain and the windlass are combined a safety-rope, a weight, and a releasing mechanism, so that when a fire breaks out on the stage while the curtain is up, as soon as the fire reaches the safety-rope and burns the same the weight drops, the hoisting-drum is released, and the curtain drops down automatically. With the curtain and the windlass is also combined a self-regulating brake, to check the descent of the curtain as the same is being lowered. With the curtain and its safety-rope is combined a ventilator, which is automatically thrown open whenever the safety-rope is parted and the curtain dropped, so as to provide for the escape of smoke.

In the drawing, the letter A designates the stage of a theater, which is provided with a drop-curtain, B. In the example shown in the drawing this curtain is constructed of four frames, *a b c d*, each frame containing a sheet of wire-cloth, and being braced properly for strength and durability, all the parts being of metal, so that a fire-proof curtain is produced. Said frames are guided in grooves *e f g h*, respectively, which run parallel to each other, and are of such a depth that the

several frames, when let down, are retained in the position shown in Fig. 1. Each of the frames B is provided with vertical rods *a*², (see Fig. 7 especially,) upon which the adjoining frames are arranged, and which serve to truly and evenly guide the frames in their vertical movements. Thus each frame guides the other. This is an important feature, more especially where the sections are from thirty to forty feet long, inasmuch as the frames are substantially retained subjacent to each other, and each affords a guide to the other.

From the lowest frame, *d*, extend one or more hoisting-ropes, *i*, (two being shown in the drawing,) over guide-pulleys *j k*, to a windlass, C, the drum of the windlass being made in two divisions, one for each of the hoisting-ropes. (See Figs. 1, 5, and 6.) When the windlass is turned in the proper direction the frame *d* rises first, until its bottom rail strikes the bottom rail of the next frame, *c*, and carries the same up with it, and so on until all the frames are clear up in the position shown in Fig. 7.

In lowering the curtain all the frames move down together until the frame *a* is arrested by its guide-grooves; then the remaining frames move down until the frame *b* is arrested by its guide-grooves, and so on.

In order to check the descent of the curtain, I have provided the windlass C with a friction-brake, D, (see Fig. 4,) which is drawn tight by a weight, E, suspended from a lever, F. But since the weight of the curtain in its descent decreases whenever one of its frames is arrested in its guide-grooves, the friction-brake is made self-adjusting in the following manner: The weight E is suspended from a strap, *l*, in which are mounted two pulleys, *m n*, one of which travels on the lever F, while the other supports a rope, *o*, one end of which is fastened to the frame of the windlass, while its other end is fastened to a drum, *p*, which is mounted loosely on the shaft of the windlass, but connected with the same by a ratchet-wheel, *q*, and pawl *r*, (see Fig. 4,) so that when the windlass is turned in the direction of the arrows shown in Fig. 4, for winding up the hoisting-ropes, the drum *p* remains stationary; but when the windlass

turns in the opposite direction, for lowering the curtain, the drum *p* is rotated, and the rope *o* winds up on the same; and as this rope winds up the weight *E* is slowly drawn in, and the retarding power of the friction-brake is gradually decreased as the curtain is lowered.

On the shaft of the hoisting-drum is firmly mounted a cog-wheel, *s*, which gears into a pinion, *t*, mounted on the driving-shaft *G*. This driving-shaft has its bearings in journal-boxes formed on the frame of the windlass, and its journals are made of such a length that said shaft can be moved in the direction of its length a sufficient distance to throw the pinion *t* out of gear with the cog-wheel *s*, and to liberate the hoisting-drum of the windlass. On the driving-shaft is formed a shoulder, *u*, to engage with a latch, *v*, which prevents said shaft from moving in the direction of its length, and which, when thrown against said shoulder, retains the pinion *t* in gear with the cog-wheel *s*. A stop-pawl, *w*, which engages with the pinion *t*, prevents the hoisting-drum from turning back. When it is desired to lower the curtain by hand this stop-pawl must be thrown back out of gear with the pinion *t*.

In case of fire on the stage, however, the curtain is lowered automatically by the following mechanism: Over the stage is run a rope, *H*, which is supported by a series of guide-pulleys, *a*¹, and which forms a bight, from which is suspended a weight, *I*. On the end of the windlass-frame, beneath this weight, are two levers, *b*¹ *c*¹, Figs. 1 and 5, the lever *b*¹ bearing with its inner end against the latch *v*, and the lever *c*¹ being provided at its upper end with a fork, which engages with a groove formed in the end of the driving-shaft.

If a fire occurs on the stage while the curtain is raised, and as soon as the rope *H* is burned off at any place, the weight *I* drops down, and as the same strikes the lever *b*¹ the latch *v* is thrown back, and by the action of the weight on the lever *c*¹ the driving-shaft is moved in its journal, so as to throw the pinion *t* out of gear with the cog-wheel *s*. By these means the hoisting-drum is liberated, and the curtain drops down by its own gravity, its fall being checked by the self-adjusting brake *D*.

The side and front walls of the stage are intended to be made of brick or other refractory material, and since my curtain is non-combustible, as soon as this curtain is closed down the audience-room of the theater is completely shut off from the stage, and the fire is entirely confined to the stage.

With the safety-rope *H* I have also combined a ventilator, *K*, which is automatically opened whenever the safety-rope is burned off, so as to provide for the escape of smoke. This object is effected as follows: In the top of the ventilator, Figs. 1 and 3, are two

valves, *d*¹, from which extend arms *e*¹, and from these arms are suspended weights *f*¹, Fig. 3, so that when said valves are not locked they fly open by the action of these weights. The valves *d*¹ are closed by means of cords *g*¹, which are suspended from levers *h*¹, that connect with said valves by cords *i*¹. One of said valves overlaps the other, and from this overlapping valve is suspended a rod, *j*¹, provided with a hole, *k*¹, to engage with a bolt, *l*¹, Fig. 1, which is formed on a slide, *m*¹, that is guided in suitable brackets *n*¹, secured to the roof. With this slide is combined a bell-crank lever, *o*¹, one arm of which engages with the slide, (see Fig. 1,) while from its other arm is suspended a weight, *p*¹. On the opposite end of the slide is formed a shoulder, *q*¹, which engages with a pawl, *r*¹, and from the tail end of this pawl is suspended a weight, *s*¹, which, when liberated, throws the pawl out of gear with the shoulder *q*, and allows the slide to move back by the action of the weight *p* and bell-crank lever *o*¹. The weight *s*¹ is sustained by a rope, *t*¹, which connects with the safety-rope *H*. If the safety-rope is burned off, the weight *s*¹ drops down, the slide *m*¹ liberates the rod *j*¹, and the valves *d*¹ are thrown open automatically, so as to provide for a free escape of smoke.

With the valves *d*¹ and levers *h*¹ are combined additional valves *u*¹, which can be opened or closed by hand independent of the valves *d*¹, so as to provide for ventilation, but which are also thrown open automatically whenever the valves *d*¹ are opened by their weights *f*¹.

It must be remarked that, where circumstances allow it, the curtain may be made in a single piece.

The hoisting-ropes are made of wire, and the safety-rope of hemp or other combustible material.

By these means the spectators in a theater are effectually protected against all danger from a fire occurring on the stage, and also from the smoke, which, if not allowed to escape, would penetrate the house, and which, even in itself harmless, would create a dangerous panic.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a curtain for theaters, &c., the frames *B*, filled with fire-proof material, and each frame constructed with vertical rods *a*², upon which the adjoining frames move and are guided, and each frame being arranged at its side edges in guide-grooves, in combination with one or more hoisting-ropes, extending from a windlass to the bottom frame of the curtain, substantially as described.

2. The combination, with a curtain and the windlass of a safety-rope, of a weight and a mechanism for freeing the hoisting-drum of the windlass, all constructed and operating substantially as and for the purpose set forth.

3. The combination, with a curtain and with

the windlass used for raising and lowering the same, of a self-regulating brake, constructed and operating substantially as and for the purpose shown and described.

4. The combination, with a curtain, the hoisting-gear, and the safety-rope, of a ventilator, which is automatically thrown open whenever the safety-rope is parted, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 5th day of February, 1877.

CHAS. HOFFMANN. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.