

No. 792,893.

PATENTED JUNE 20, 1905.

R. J. GOOD & G. E. HALL.

MINE CURTAIN.

APPLICATION FILED APR. 29, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

WITNESSES

Joseph J. Hosler.

Minnie F. Anthony.

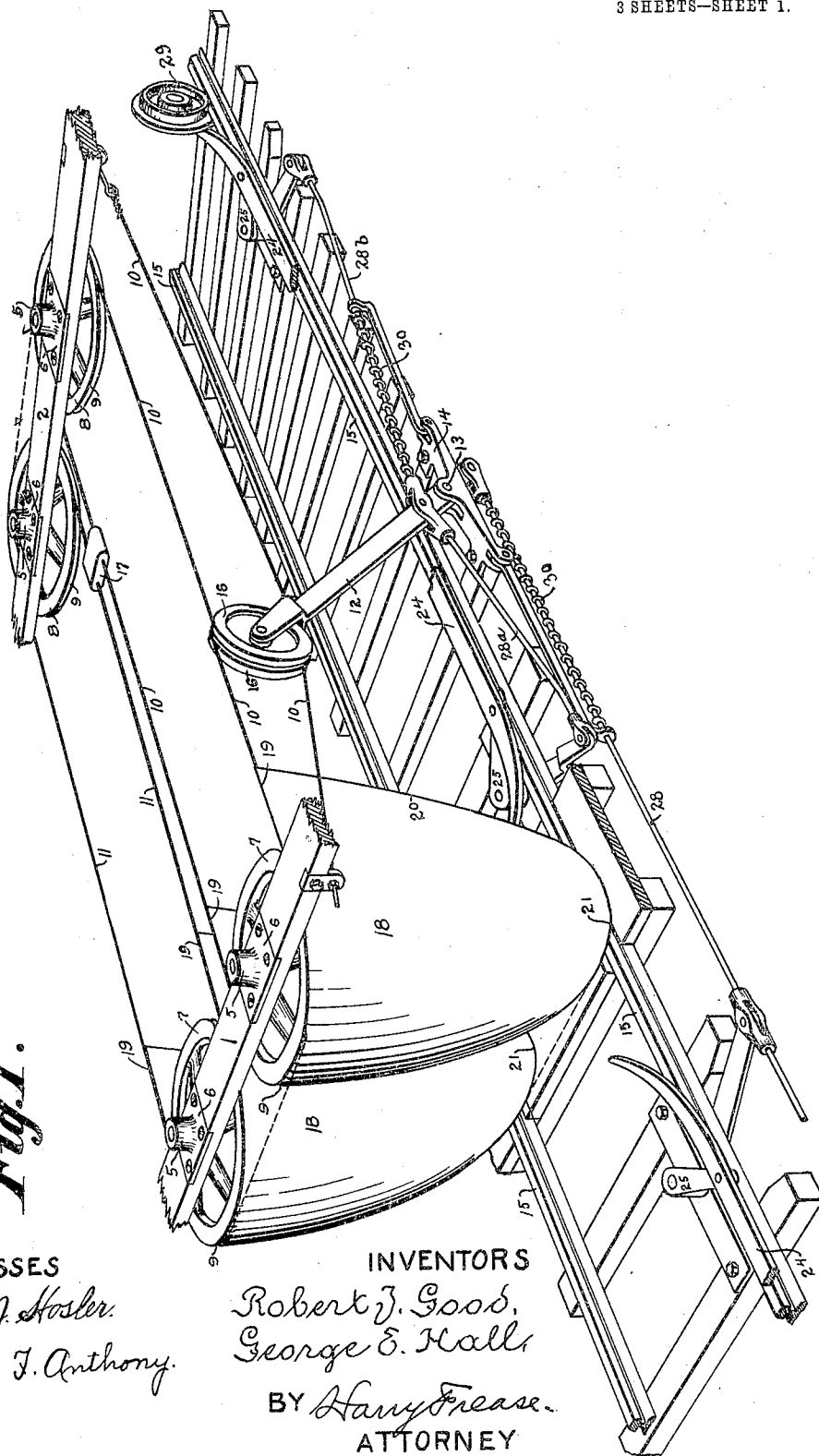
INVENTORS

Robert J. Good,

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ATTORNEY



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3 SHEETS—SHEET 2.

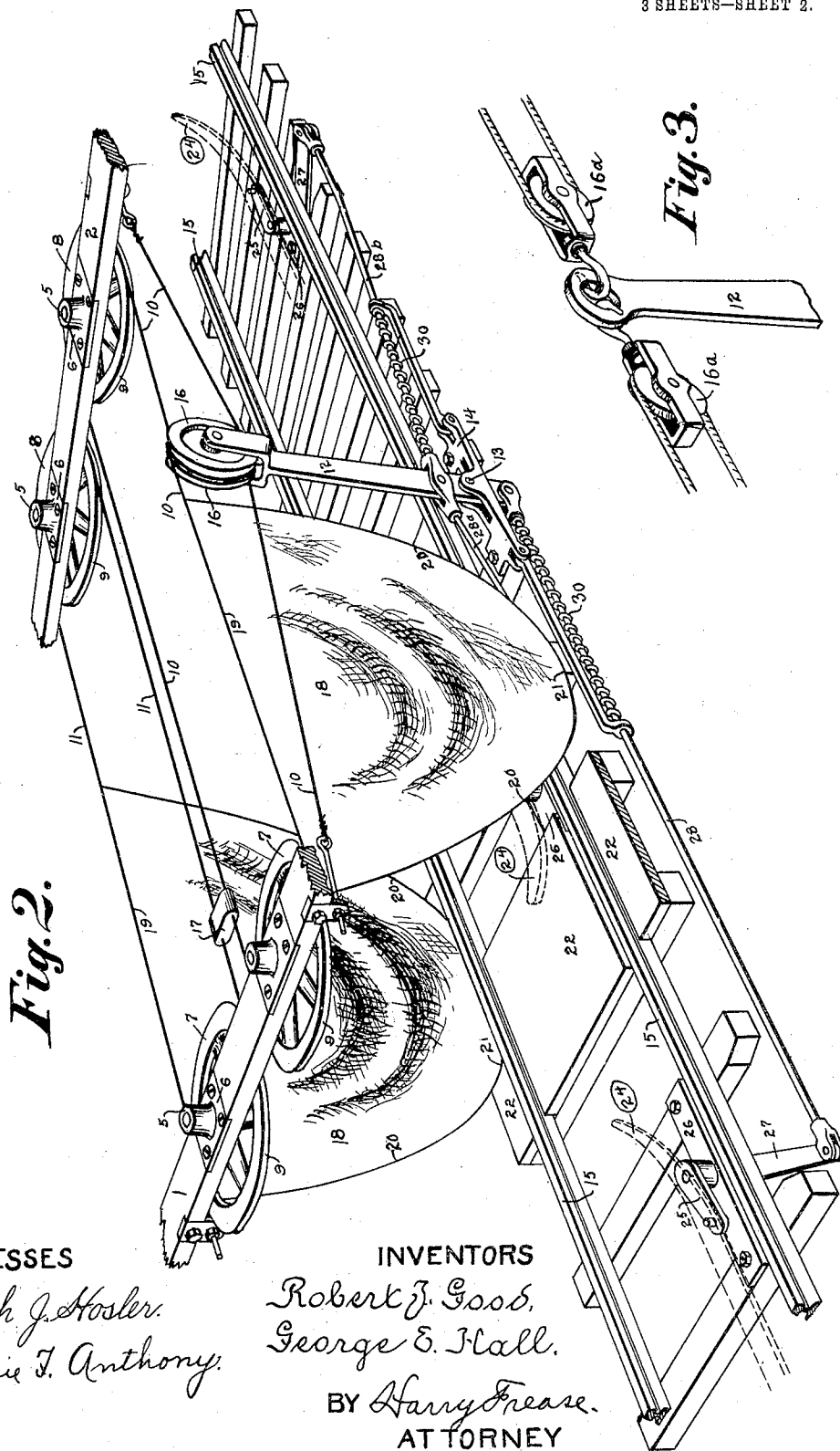


Fig. 2.

Fig. 3.

WITNESSES

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3 SHEETS—SHEET 3.

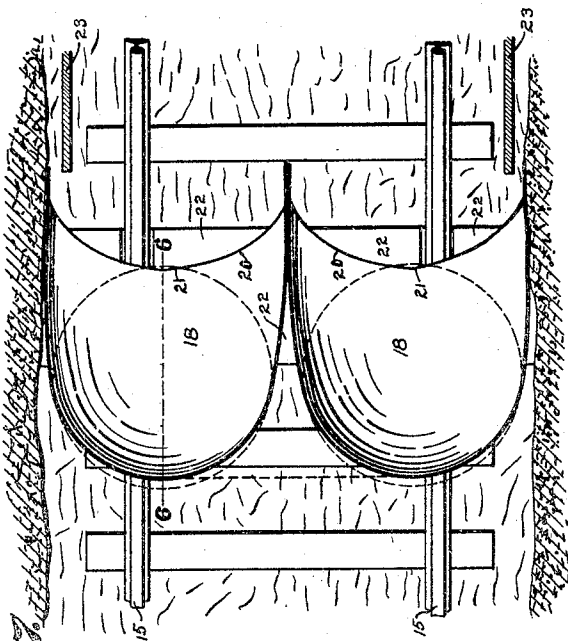


Fig. 2.

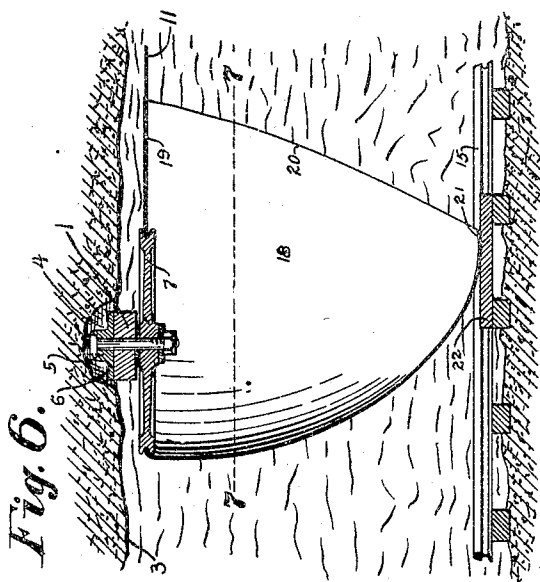


Fig. 6.

WITNESSES

Joseph J. Hooper.
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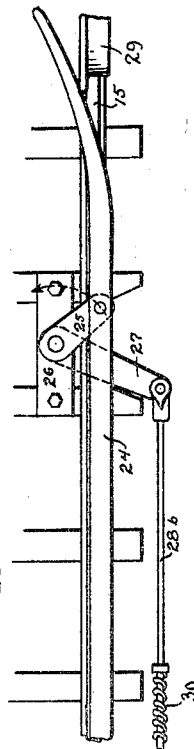
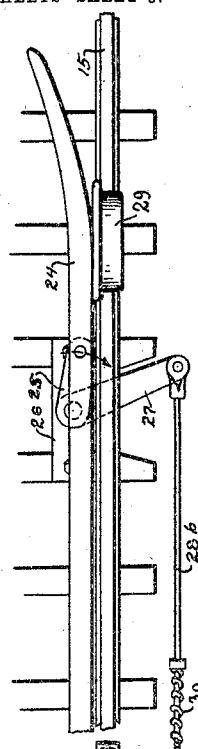


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

ROBERT J. GOOD AND GEORGE E. HALL, OF CANTON, OHIO.

MINE-CURTAIN.

SPECIFICATION forming part of Letters Patent No. 792,893, dated June 20, 1905.

Application filed April 29, 1904. Serial No. 205,488.

To all whom it may concern:

Be it known that we, ROBERT J. GOOD and GEORGE E. HALL, citizens of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Mine-Curtains, of which the following is a specification.

In the ventilation of mines it is usually necessary to partition the entries at various places for controlling and properly directing the air-currents. In entries which are little traveled this may be done by building a wooden partition with an ordinary door swinging on hinges; but in passage-ways which are much used, and particularly those along which mine-cars are hauled, such a door is very cumbersome to operate and is also quite dangerous when not opened promptly and surely on the approach of a car.

To meet some of the objections and dangers of a hinged door, a curtain made of textile material has been used across the entry, either by hanging on a roller, by the rotation of which it is raised and lowered, or by suspending in a frame and lifting it from below by various kinds of mechanism; but there is such a stiffness required in a partition of this character to withstand the current and pressure of the air on account of which it is used that transverse strips or bars must be applied to it, and these make the curtain heavy and cumbersome and difficult to operate without considerable power and almost, if not quite, as dangerous as a solid door. Furthermore, such doors and curtains have usually been operated by means of depressible rails or platforms located in the entry each way from the partition, on which the wheels of the cars or the mine mules are adapted to tread; but such a mechanism is exceedingly liable to be rendered inoperative by reason of the lodgment of the usual mine refuse under and about it, and it is otherwise objectionable because of the limited amount of movement practically found possible to make with it.

This invention relates to a curtain or a pair of curtains hung or suspended across the entry and adapted to be opened by being moved laterally and along the side of the entry and when closed to utilize the air current or pres-

sure to force the free edges against the sides of the entry and when a pair of curtains are used to force the adjoining edges together and also to a mechanism for operating the curtains adapted to be actuated by the wheels of the mine-car coming against the curved or inclined ends of laterally-movable bars located immediately above the rails of the track. These objects are attained by the mechanism, construction, and arrangement illustrated in the accompanying drawings, in which a pair of curtains opening each way from the middle line is shown, and in which—

Figure 1 is a perspective view of a section of track with the curtains closed and the corresponding position of the operating mechanism, but not showing any part of the mine-entry; Fig. 2, a similar view showing the curtains drawn open and the corresponding position of the operating mechanism; Fig. 3, a detached perspective view showing an alternate arrangement of the initial pulleys; Fig. 4, a plan view of a fragment of track, showing the position of one operating-bar where the curtains are closed; Fig. 5, a similar view showing the position of the operating-bar when the curtains are drawn open; Fig. 6, a vertical longitudinal section of an entry on the axis of one of the curtain-wheels; and Fig. 7, a horizontal longitudinal section on line 7 7, Fig. 6.

Similar numerals refer to similar parts throughout the drawings.

The supporting-plates 1 and 2 are transversely mounted in the upper part of the entry, preferably against the roof 3 thereof, and when so located recesses, as 4, are cut in the roof to receive the hubs 5 of the bearings 6 of the curtain-wheels 7 and idle wheels 8, as shown for the former in Fig. 6. The curtain-wheels and the idle wheels are horizontally located in lateral pairs immediately below the supporting-plates and are provided with the peripheral grooves 9, which are adapted to guide the primary and secondary cords or cables 10 and 11.

The operating-lever 12 is fulcrumed on the transverse pivot 13 in the bracket 14, located at one side of the track 15 about midway between the supporting-plates, and on the upper end of the lever are mounted the inde-

pendently-rotating initial pulleys 16. One end of the primary cable 10 is attached to the curtain-wheel-supporting plate. Thence it is passed in succession around one of the initial pulleys, the adjacent curtain-wheel and idle-wheel and the other initial pulley, and thence to the idle-wheel plate, where its other end is attached. The secondary cable 11 forms a continuous loop around the other curtain-wheel and idle wheel, and the adjacent parts of the two cables are tied together by means of the clamp 17, so that they are caused to operate in unison in opposite directions around the respective wheels on each side. The curtains 18 are made of canvas or other flexible material and are cut with the upper edges 19 straight and the side edges 20 inclined toward each other to the curved bottom edges 21, and the lower edges are then gathered, so as to make the curtain, and especially the lower part thereof, full and baggy. The curtains 18 are attached by their upper edges 19 to the respective cables, by which they are closed by being drawn inward around the curtain-wheels and opened by being drawn outward and thence along the sides of the entry. The cables constitute a transversely-positioned U-shaped support for the curtains when they are closed, with the substantially straight arms directed forward in the face of the air-current. The sides of the curtains hang directly down from the arms of the support, along which the upper edges are extended for some distance, and the side edges 20 are inclined downward and rearward, so as to bring the lower edges 21 across and adjacent to the bottom of the entry below a point intermediate the ends of the support. The bodies of the curtains are made quite full, so they hang first directly downward from the curved part of the support and thence curve inward and forward to the lower edge, as shown in Fig. 6. This arrangement gives the curtains a bag-like shape, with the open side directed forward in the face of the air-current, the pressure of which acts to bulge each body out to somewhat the shape of the segment of the mantle of an inverted dome, with the upper edge around the curved part of the support as the base and the lower edge abutting and pressing against the track or bottom of the entry as the apex, as shown in Fig. 1. The same pressure acts to force the outer side edges firmly against the sides of the entry and the inner side edges against each other, thereby completely closing the entry against the passage of air. The extension of the upper edges of the curtains along the straight sides of the support serves to brace and sustain the lower part of the curtains against the air-pressure.

The mine-track is preferably planked, as at 22, so as to present a smooth surface for the lower edges of the curtains to bear against, and the shields 23 may be provided adjacent to the sides of the entry, behind which the

curtains may be drawn when opened to prevent any interference with a passing car.

Separately-mounted pulleys, as 16^a, can as well be attached on the end of the operating-lever, as shown in Fig. 3, instead of the arrangement of initial pulleys described above, and when a single curtain is used the cable on which it is hung is passed around the outer sides of all the curtain and idle wheels, as shown by broken lines in Fig. 1. The advantage, however, of a pair of curtains is that being smaller and lighter they are more convenient to operate and control, and the division between them provides a suitable place for passing a trolley-wire above and a traction-cable below.

The operating-bars 24 are pivoted on the upper cranks 25, which in turn are vertically pivoted in the brackets 26, which are mounted on the track inside the rail, and the cranks 25 are adapted to rotate outwardly immediately above the rail. The lower cranks 27 are joined with the upper cranks and are adapted to operate under the rail, and these lower cranks are coupled with the operating-lever at suitable points above and below its fulcrum-point by means of the connecting-bars 28, 28^a, and 28^b.

The normal position of the operating-bars—that is to say, their position when the curtains are closed—is over the outer side of the rail, and the ends of the bars are curved or inclined inward far enough to extend inside of the wheels 29 of the mine-cars, as shown in Figs. 1 and 4. As a car approaches, the inner or flange edge of the wheel strikes the inclined end of the bar and forces or wedges it laterally inward, which rotates the cranks, as indicated by arrows in Fig. 4, which rotation operating through the connecting-bars and operating-lever serves to throw the initial pulleys away from the curtain-wheels, which is the required movement for drawing the curtains open. The spiral springs 30 are provided on the respective connecting-bars and are adapted to act against the inward movement of the operating-bars, so that when the car-wheels have cleared the farther end of the bar these springs throw the operating-bar outward to its normal position and at the same time throw the initial pulleys toward the curtain-wheels, which is the required movement for closing the curtains. It is preferred to use two operating-bars, as illustrated, one on each side of the curtain and with the space between their adjacent ends less than the length of the wheel-base of the mine-car, so that the curtain will be held open until the car passes both bars.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a mine-entry, two pairs of horizontal wheels mounted transversely near the roof, cables around the wheels of each side with means for operating the same in reverse direc-

tions, full-bodied curtains hung on the cables around the wheels of one pair having their outer side edges adjacent to the sides of the entry and their inner side edges adjacent to each other and the lower edges across and adjacent to the bottom of the entry.

2. In a mine-entry, a transversely-positioned U-shaped support near the roof thereof, a full-bodied curtain hung on the support having its lower edge across and adjacent to the bottom of the entry below a point intermediate the ends of the support, from which edge the body of the curtain is curved rearward and upward and the side edges are inclined upward and forward to the support, and means for laterally moving the curtain on the support.

3. In a mine-entry, a transversely-positioned U-shaped support near the roof thereof, a full-bodied curtain hung on the support having its lower edge across and adjacent to the bottom of the entry below a point intermediate the ends of the support, from which edge the body of the curtain is curved rearward and upward and the side edges are inclined forward and upward to the support.

4. In a mine-entry, a movable partition, a track-rail, vertically-pivoted cranks adjacent thereto, spring-resisted operative connection between the cranks and the partition, and a bar pivoted on the cranks and arranged to rotate over the rail and having laterally-inclined ends, the bar being normally located in the path of the wheel of a car so as to be operated by the same.

5. In a mine-entry, a movable partition, a track-rail, vertically-pivoted cranks adjacent thereto, spring-resisted operative connections between the cranks and the partition, and a bar pivoted on the cranks and arranged to rotate over the rail and having inwardly-inclined ends, the bar being normally located in the path of the flange of a car-wheel so as to be operated by the same.

In testimony whereof we have hereunto signed our names to this specification in the presence of two subscribing witnesses.

ROBERT J. GOOD.
GEORGE E. HALL.

Witnesses:

HARRY FREASE,
MINNIE F. ANTHONY.