

J. KRESS.  
SYSTEM FOR VENTILATING TUNNELS.

(Application filed Dec. 4, 1901.)

(No Model.)

2 Sheets—Sheet 1.

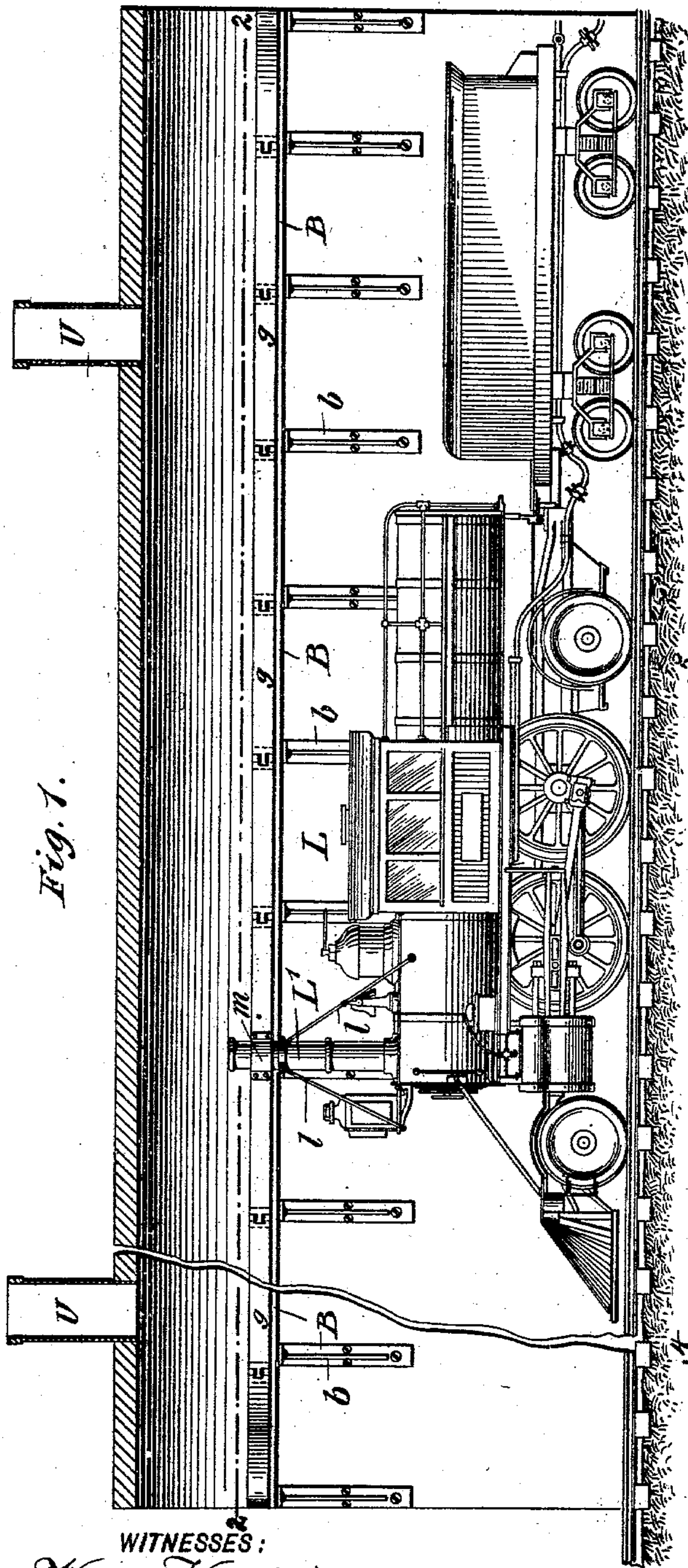


Fig. 1.

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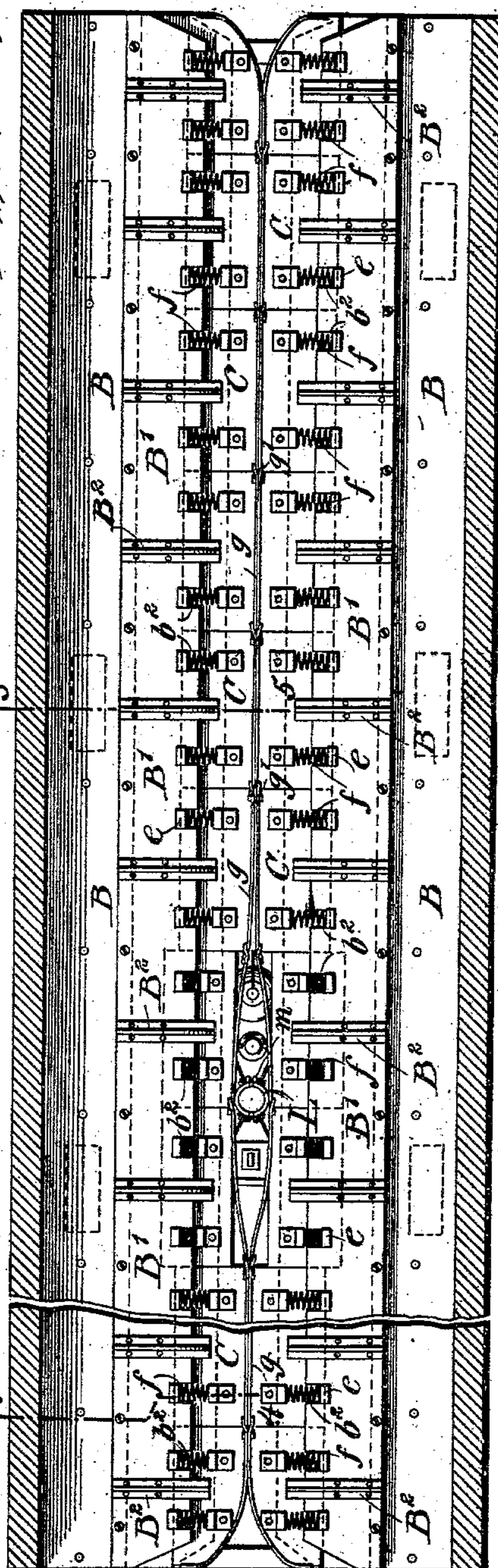


Fig. 2.

INVENTOR

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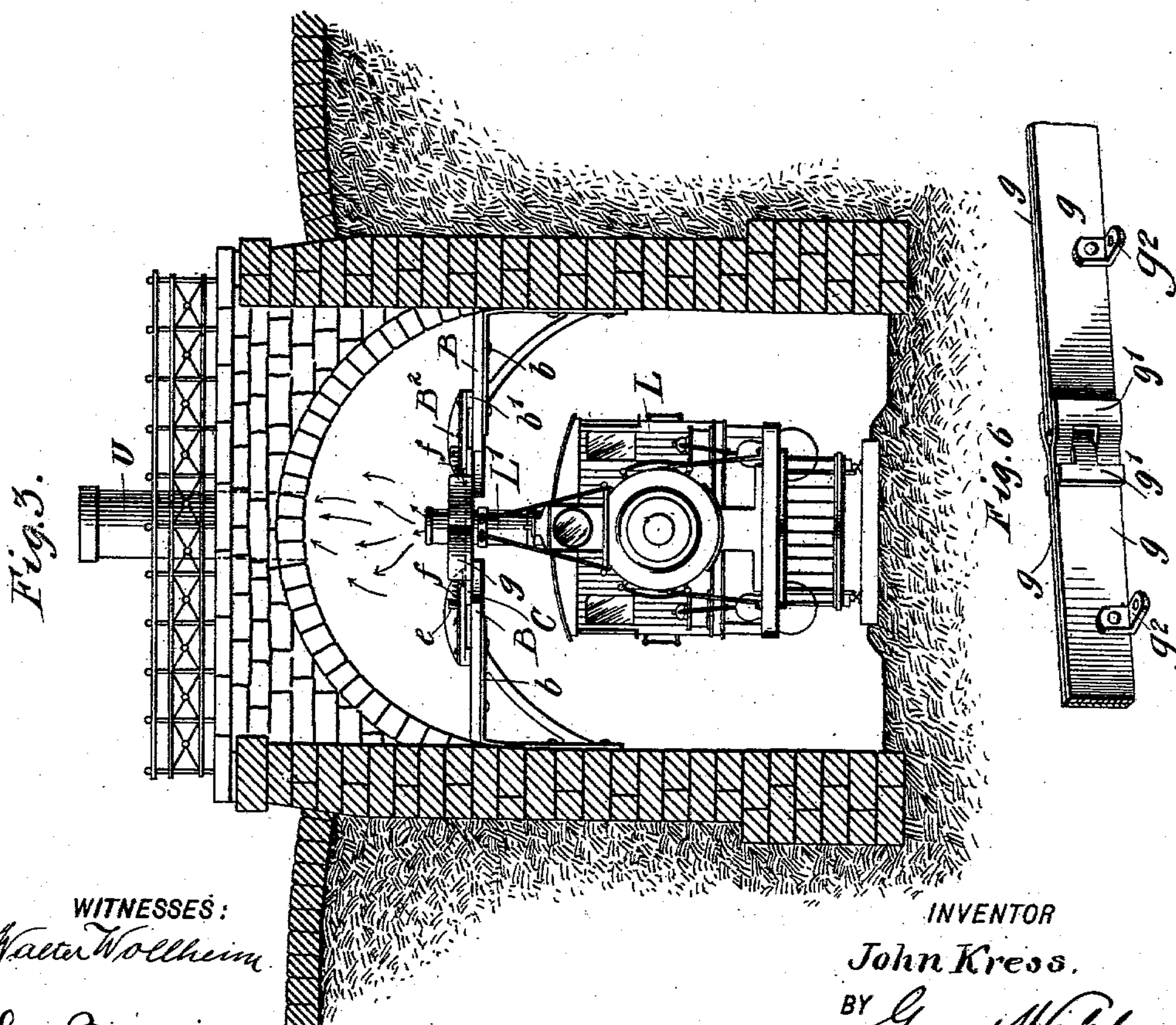
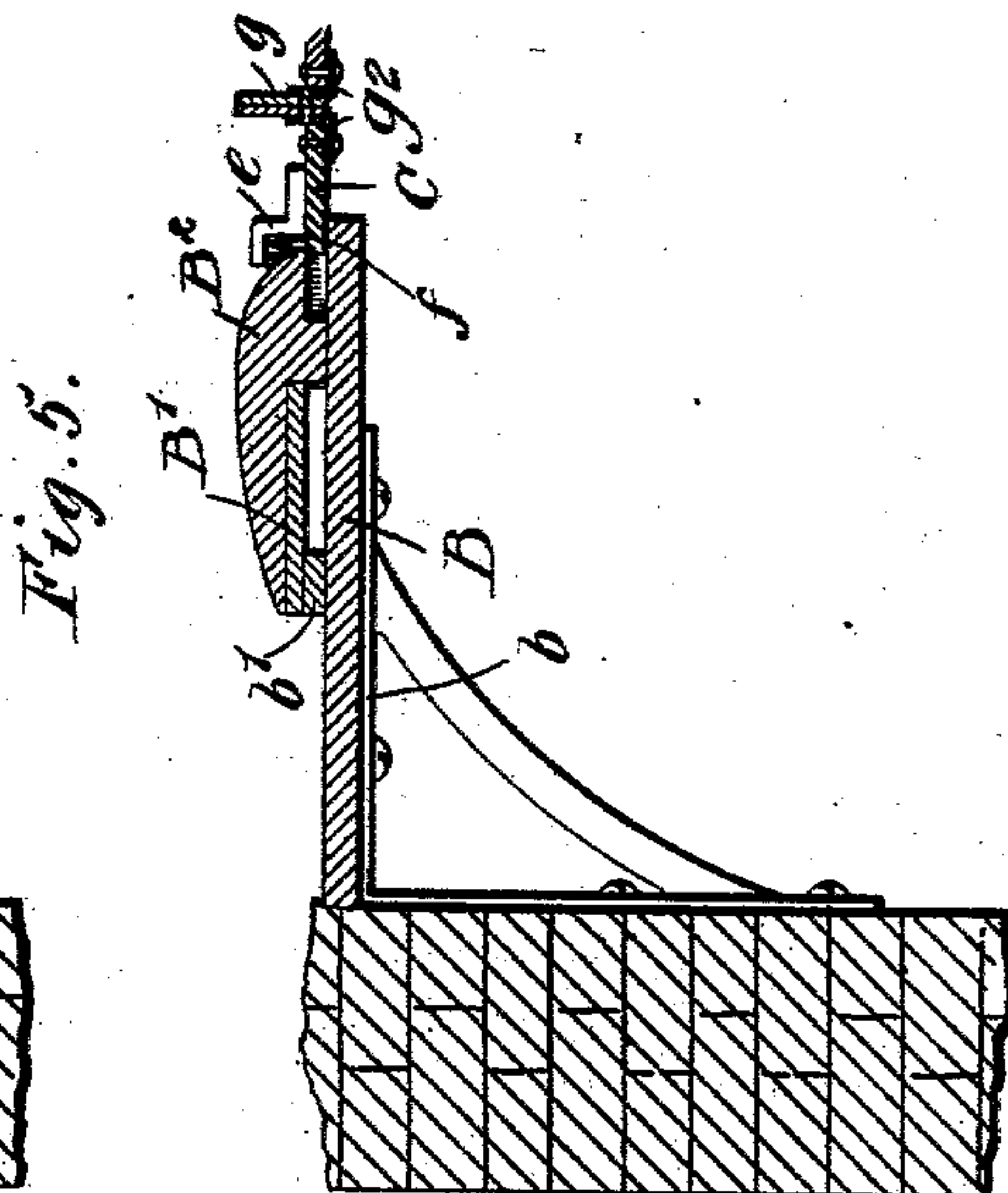
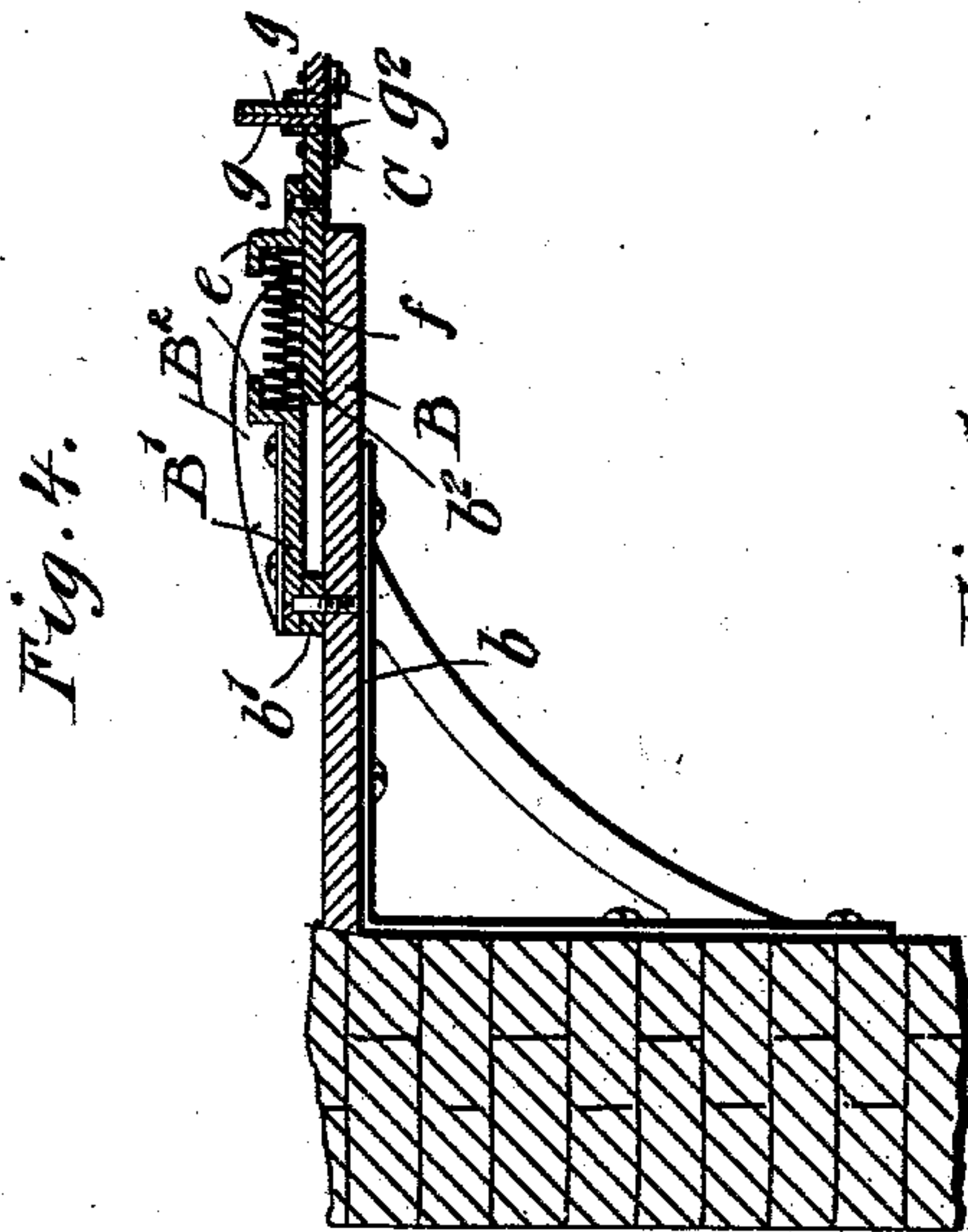


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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

JOHN KRESS, OF NEW ROCHELLE, NEW YORK.

## SYSTEM FOR VENTILATING TUNNELS.

SPECIFICATION forming part of Letters Patent No. 704,808, dated July 15, 1902.

Application filed December 4, 1901. Serial No. 84,692. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN KRESS, of New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Systems of Ventilating Tunnels, of which the following is a specification.

This invention is intended to supply a reliable and effective means of ventilating tunnels, so as to remove the noxious gases given off from the locomotive, and thereby keep the air in the tunnel wholesome and unvitiated, at the same time doing away with the necessity of keeping the windows and doors of the cars closed while the train passes through the tunnel; and for this purpose the invention consists of a system of ventilating tunnels which comprises a horizontal partition formed of stationary guide-plates supported on brackets attached to the walls of the tunnel, spring-cushioned slide-plates arranged on said guide-plates and provided with contact plates or flanges at adjacent longitudinal edges, keepers for the spring-cushioned slide-plates, an extension-stack for the smoke-stack of the locomotive, said stack being provided with suitable protecting-plates where it enters between the contact plates or flanges of the spring-cushioned slide-plates when the train is passing through the tunnel, the spring-cushioned slide-plates at the ingoing and outgoing ends of the tunnel having adjacent corners curved outwardly, so as to permit the entrance of the extension-stack, and said spring-cushioned slide-plates being of suitable length in order to open and close quickly, so that the smoke and noxious gases which are collected in the upper section of the tunnel cannot escape into the lower part as the extension-stack passes between them.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of a tunnel, showing a locomotive in the same, so as to illustrate my improved system of ventilation. Fig. 2 is a horizontal section of the tunnel on line 2 2, Fig. 1. Fig. 3 is an end elevation of the tunnel at the left-hand side of Fig. 1. Figs. 4 and 5 are vertical transverse sections, respectively, on lines 4 4 and 5 5, Fig. 2, showing in part the horizontal parti-

tion with the supporting-brackets, the guide-plates, and the slide-plates, by which the upper part of the tunnel is shut off from the lower part; and Fig. 6 is a detail perspective view showing the connection of the contact-flanges of two adjacent slide-plates.

Similar letters of reference indicate corresponding parts.

In my improved system of ventilating tunnels, so as to prevent the inconveniences arising from the smoke and gases delivered from the locomotive, I divide the tunnel by means of a horizontal partition-wall into a larger lower section and a smaller upper section. This horizontal partition-wall is sufficiently high to permit the free passage of cars through the tunnel. The horizontal partition-wall is formed of two symmetrical sections which are supported by brackets that are attached at suitable distances from each other to the side walls of the tunnel. Each section of the horizontal partition-wall consists of a stationary guide-plate B, which is preferably sheet metal, attached by screws, rivets, or otherwise to the horizontal arms of the brackets *b*. On the horizontal guide-plates *b* are guided spring-cushioned slide-plates C, which are held in position by means of auxiliary guide-plates B', that are made, like the stationary guide-plates B, of sheet metal and are supported on longitudinal ledges *b'*, that are firmly secured to the stationary guide-plates B. The auxiliary guide-plates B' are provided at suitable distances from each other with forwardly-projecting keepers B<sup>2</sup>, which extend over the spring-cushioned slide-plates, so as to prevent the raising of the same when they are in forward position, said keepers being made in the form of ribs, by which the strength of the auxiliary guide-plates is increased. The transverse edges of adjacent spring-cushioned slide-plates interlock with each other, permitting at the same time, however, the free lateral movement of the same. Between the keepers are arranged on the spring-cushioned slide-plates and the auxiliary guide-plates the lugs *e*, between which and in suitable recesses *b<sup>2</sup>* in the edges of the auxiliary guide-plates B' (shown in Fig. 2) are arranged helical cushion-springs *f*, that serve to return



the slide-plates C into their normal position after they have been moved inwardly into the space between the stationary and auxiliary guide-plates. The lugs *e* and the cushion-  
 5 springs *f* are preferably arranged near the ends of the slide-plates C, so as to impart a uniform pressure on the same. To the adjacent longitudinal edges of the spring-cushioned slide-plates C are provided upright contact plates  
 10 or flanges *g*, that are pivotally secured to the slide-plates by the centrally-arranged angle-brackets *g*<sup>2</sup> on the contact-plates, and the ends of the contact-plates are connected by the interlocking joints *g*<sup>1</sup>, as shown in Fig. 6,  
 15 so that when a pair of slide-plates is moved in lateral direction the jointed ends of the adjacent slide-plates follow the motion of the first slide-plates until direct pressure is exerted on the contact-flanges of the second  
 20 pair of slide-plates. The slide-plates and their contact-flanges at the ingoing and outgoing ends of the tunnels are rounded off, as shown in Fig. 2, so as to facilitate the entrance of the smoke-stack of the locomotive.  
 25 The locomotive L is provided, in addition to the ordinary smoke-stack, with an extension-piece L', which is secured in position by suitable braces *l*, the upper ends of which are attached to a ring-shaped band on the  
 30 extension-piece L', while the lower ends are attached in any suitable manner to the frame of the boiler. The extension-piece L' of the smoke-stack is preferably provided at both sides with shoes or plates *m*, which serve to  
 35 receive the wear incident to the friction of the flanges *g*, as the extension-stack passes between them. These plates or shoes *m* are preferably bolted together at the front and rear of the extension-piece L' and can be re-  
 40 placed from time to time as they are worn out by use.

The tunnel is provided at suitable intervals with uptakes U, through which the circulation of air is established from the upper  
 45 section of the tunnel, so as to conduct off the smoke and gases that are delivered into said upper chamber from the smoke-stack of the locomotive.

When the train is entering the tunnel, the  
 50 extension-piece L' of the smoke-stack enters between the rounded-off ends of the slide-plates C, forces them aside, and then passes through between the contact-flanges of the slide-plates. The slide-plates being spring-  
 55 cushioned they close up immediately as soon as the extension-piece has passed one pair of slide-plates. In this manner the extension-pieces leave only a small elongated opening in front or in back of the extension-stack,  
 60 according to its position relative to slide-plates, as shown in Fig. 2, so that comparatively little smoke and gas can pass into the larger portion of the tunnel below the horizontal partition. By the ventilation estab-  
 65 lished in the upper arched chamber of the tunnel by means of open ends and the up-

takes arranged at suitable distances the smoke and gases are gradually carried off, while the cinders are collected on the upper part of the horizontal partition, from which  
 70 they can be removed from time to time by means of openings formed by removable horizontal plates at certain distances from each other, as shown in dotted lines in Fig. 2.

By the arrangement described the tunnel  
 75 can be ventilated in such a manner that the serious annoyance which is at present experienced by passengers owing to the obnoxious air in the tunnels is entirely obviated, and likewise the necessity of closing the win-  
 80 dows and doors, by which a circulation of the atmosphere is obtained, especially in hot weather, is also dispensed with.

My improved system of ventilation can be readily applied to the tunnels at present in  
 85 use and forms thereby a comparatively inexpensive means of removing the objectionable features of the same. The horizontal partition acts at the same time as a noise-muffler, by which the annoyance caused by the rum-  
 90 bling noise of the engine passing through the tunnel is diminished.

Having thus described my invention, I claim as new and desire to secure by Letters  
 Patent—

1. The combination, with a tunnel, of a horizontal partition formed of stationary guide-plates supported on the side walls of the tunnel, auxiliary guide-plates, spring-cushioned  
 100 slide-plates provided with upright contact plates or flanges at their adjacent longitudinal edges, and keepers for said slide-plates, substantially as set forth.

2. The combination, with a tunnel, of a horizontal partition located on the upper part of  
 105 the same and composed of two longitudinal sections which are formed of stationary guide-plates, auxiliary guide-plates, spring-cushioned slide-plates guided by said auxiliary guide-plates, said slide-plates being provided  
 110 with upright contact flanges or plates at their adjacent longitudinal edges, and keepers projecting from the upper auxiliary guide-plates over the spring-cushioned slide-plates, substantially as set forth.

3. The combination, with a tunnel provided with uptakes at a suitable distance from each other, of a horizontal partition formed of two longitudinal sections provided with guide-plates and spring-cushioned slide-plates, said  
 120 slide-plates having upright contact plates or flanges at their adjacent longitudinal edges, and interlocking joints connecting the ends of said contact-plates, substantially as set forth.

4. In a system of ventilating tunnels, the combination, with brackets attached to the side walls of the tunnel, of horizontal main guide-plates attached to said brackets, auxiliary guide-plates supported on said main  
 130 guide-plates and provided with inwardly-projecting slide-plates, and spring-cushioned



slide-plates guided between the main and auxiliary guide-plates, the adjacent edges of the slide-plates being provided with upright contact flanges or plates, and interlocking joints  
5 at the adjacent ends of said contact-flanges, substantially as set forth.

In testimony that I claim the foregoing as

my invention I have signed my name in presence of two subscribing witnesses.

JOHN KRESS.

Witnesses:

PAUL GOEPEL,  
C. BRADWAY.