No. 847,497. PATENTED MAR. 19, 1907.

F. G. NICOLAUS.

REGISTER AND VENTILATOR.

APPLICATION FILED MAR. 2, 1906.

Fig. 1.

3 SHEETS—SHEET 1.

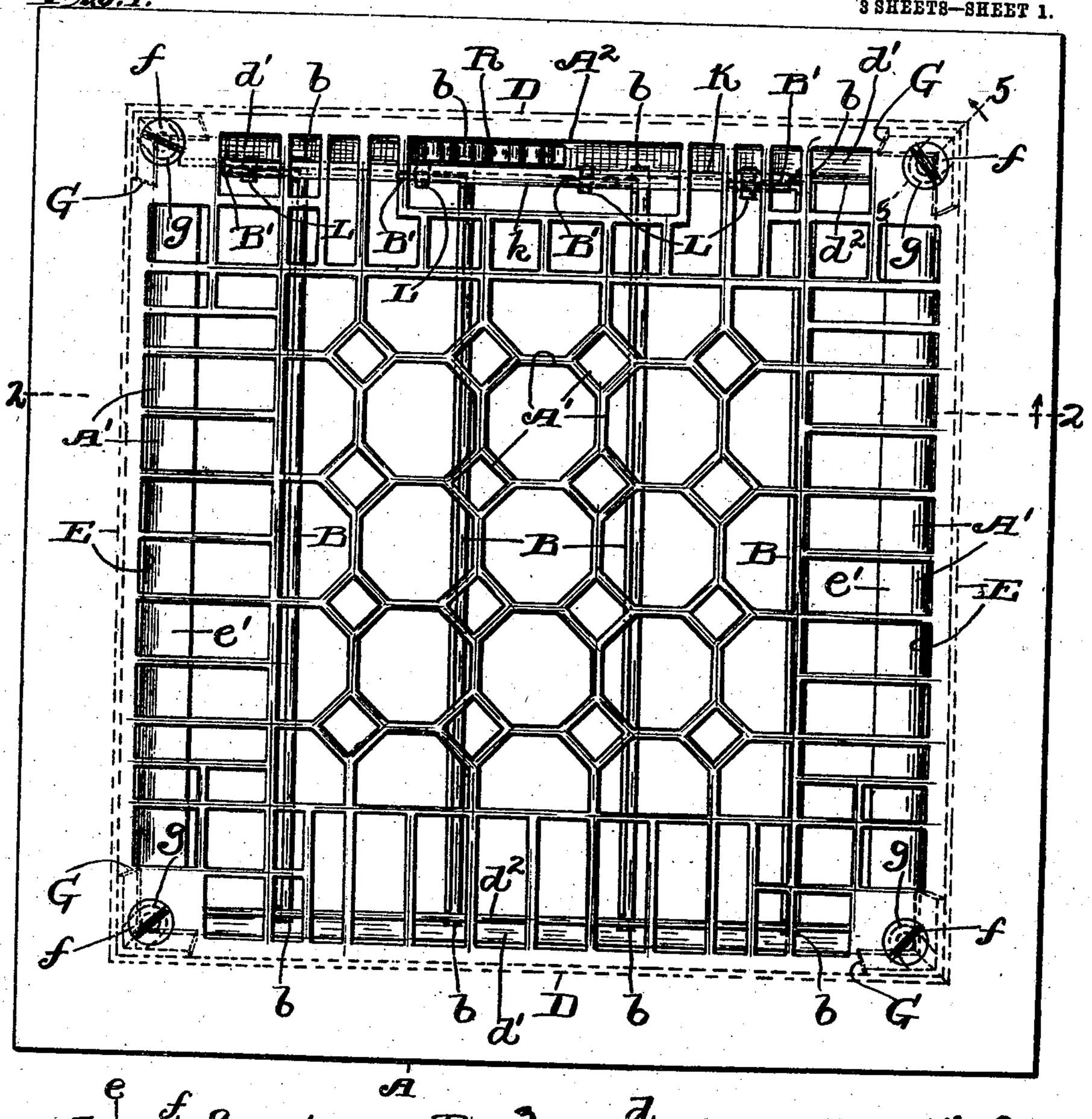
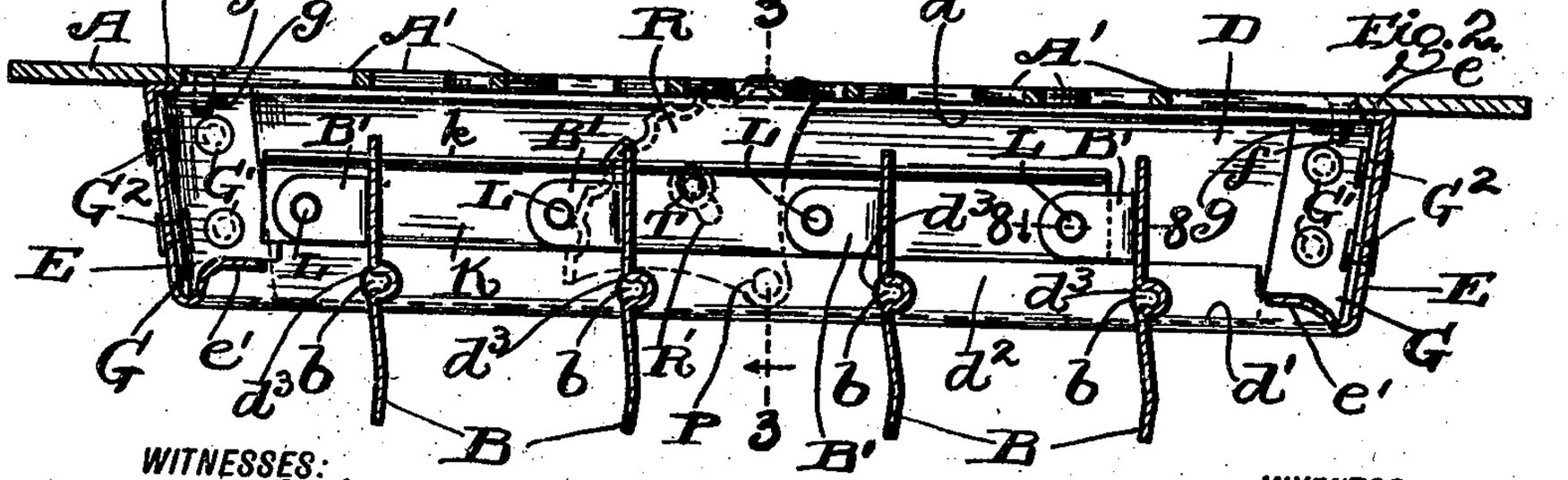


Fig. 2.



WITNESSES:

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B. C. Brown.

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3 SHEETS—SHEET 2.

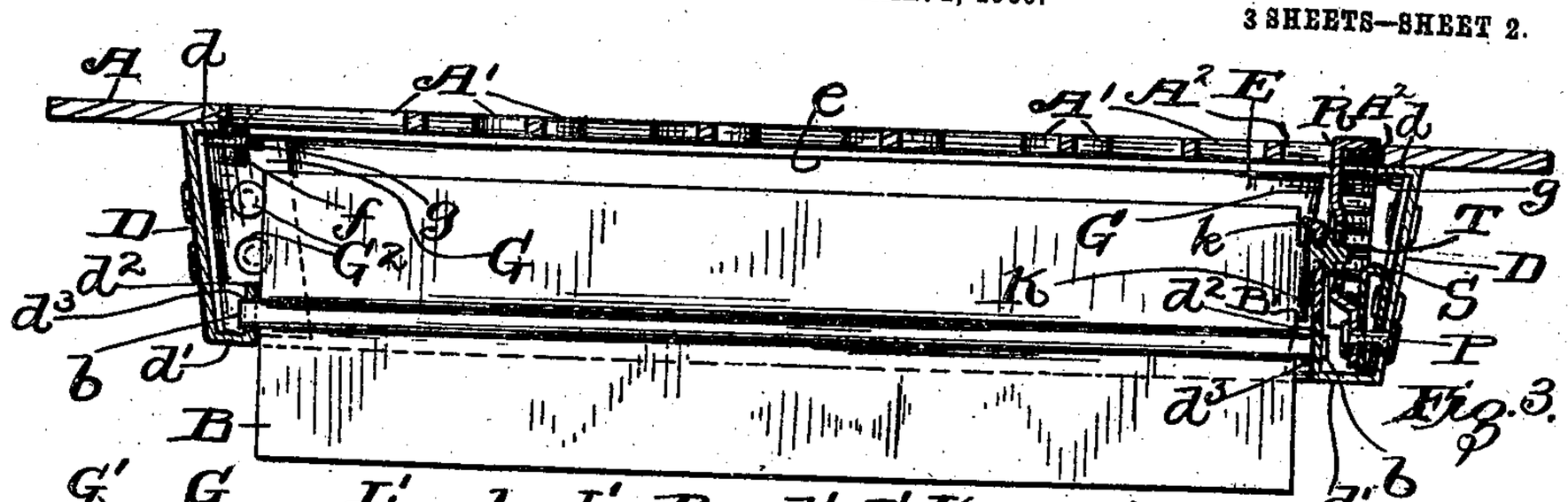

Fig. 3.

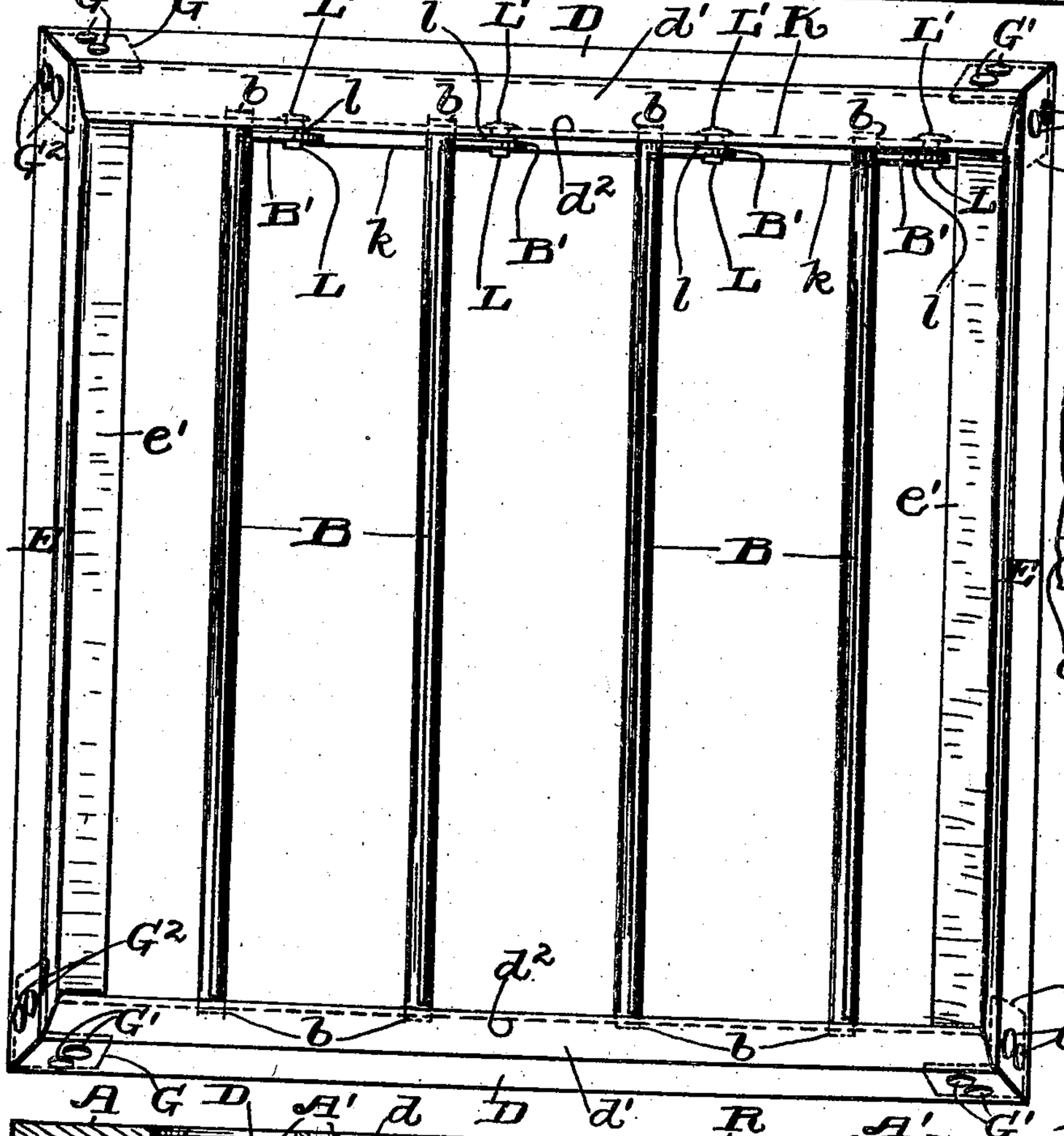

Fig. 4.

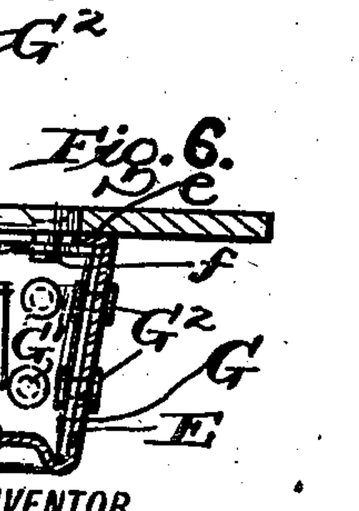

Fig. 5.

Fig. 6.

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3 SHEETS—SHEET 3.

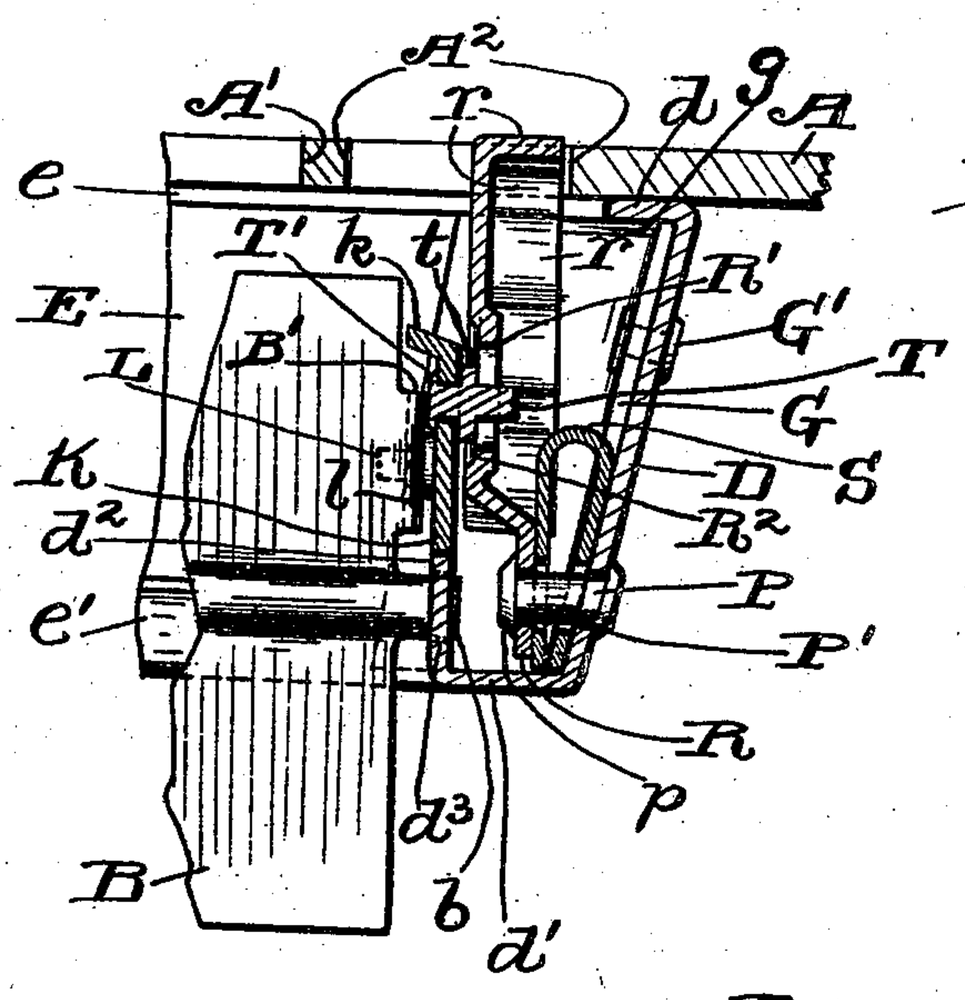

Fig. 7.

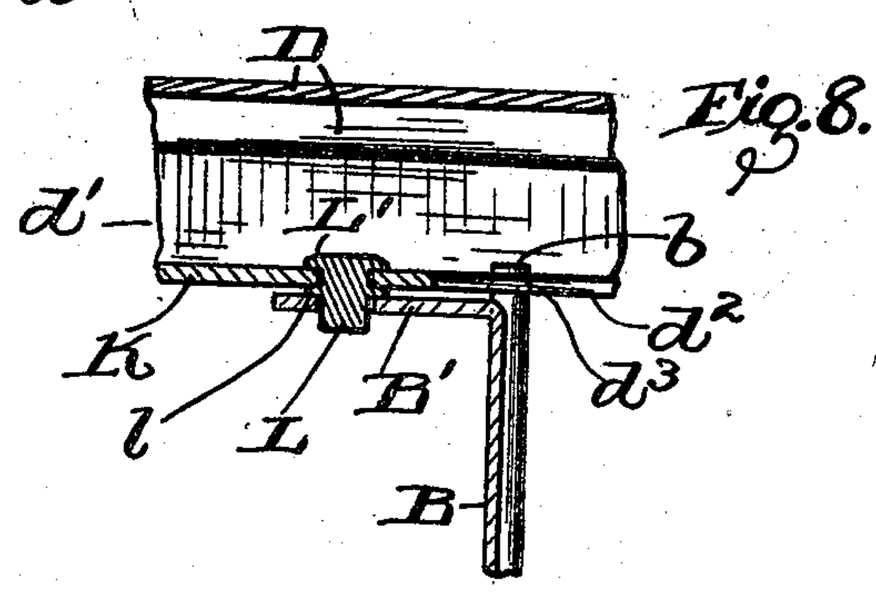

Fig. 8.

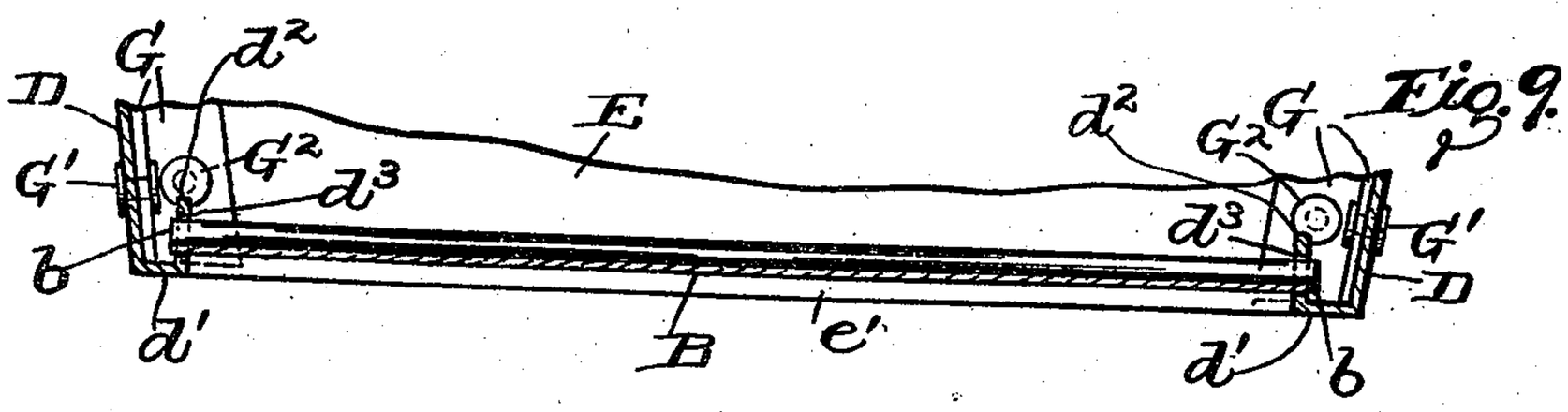

Fig. 9.

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UNITED STATES PATENT OFFICE.

FREDERIC G. NICOLAUS, OF CLEVELAND, OHIO, ASSIGNOR TO THE WALWORTH RUN FOUNDRY COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

REGISTER AND VENTILATOR.

No. 847,497. Specification of Letters Patent. Patented March 19, 1907.

Application filed March 2, 1906. Serial No. 303,832.

To all whom it may concern.

Be it known that I, FREDERIC G. NICOLAUS, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Registers and Ventilators; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in registers or ventilators.

One object of this invention is to improve the construction of the slat-bearing frame of the register or ventilator, to render the construction simple, strong, and durable, and to render the frame light in weight and more especially strong at the corners.

Another object is to improve the slat-operating mechanism, to render the said mechanism simple and durable in construction and light in weight, and to avoid rattling of the parts of the said mechanism and connected slats during their operation.

Another object is to construct the slat-bearing frame, the slats, and slat-operating mechanism in the main of sheet-metal parts and to provide the sheet-metal frame with a suitably-attached cast-metal face-plate.

With these objects in view and to the end of realizing other advantages hereinafter appearing this invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a front view of a register or ventilator embodying my invention with the rotary slats of the device in their open position. Fig. 2 is a section on line 2 2, Fig. 1, looking in the direction indicated by the arrow. Fig. 3 is a section on line 3 3, Fig. 2, looking in the direction indicated by the arrow. Fig. 4 is a rear or inner side view of the register or ventilator, with the face-plate removed. Fig. 5 is a section on line 5 5, Fig. 1, looking in the direction indicated by the arrow. Fig. 6 is a section corresponding with Fig. 2, except that in Fig. 6 the slats are shown in their closed position. Fig. 7 is an enlarged view of a portion of Fig. 3 and is illustrative of the slat-operating mechanism. Fig. 8 is an enlarged horizontal section in detail and on line 8 8, Fig. 2, illustrating the operative connection between one of the rotary slats and the slat-operating bar. Fig. 9 is a section on line 9 9, Fig. 6, looking in the direction indicated by the arrow.

Referring to the drawings, A indicates the perforated or apertured cast-metal face-plate of the register or ventilator. The said face-plate is provided in the usual manner with openings A′ for accommodating the passage of air therethrough. The face-plate A is quadrangular in plan and extends over the outer side of the space surrounded by the slat-bearing frame, which is provided with rotary parallel slats B and consists in the main of sheet-metal channel-bars D and E. A slat-bearing frame made of sheet-metal parts possesses greater strength and durability than a frame which is composed in the main of cast-metal parts and a cast-metal face-plate, not being yieldable as a stamped steel or sheet-metal face-plate, is not liable to have its japanned surfaces cracked or injured when stepped upon or knocked against, whereas the inward yielding of a stamped steel or sheet-metal face-plate will invariably in the course of a short time result in the cracking or mutilation of the japanned surfaces of the face-plate. Each slat B is provided centrally of each end thereof with a trunnion *b*, with the trunnions of both ends of the slats arranged in line endwise. The space in which the slats B are adapted to operate is surrounded by the quadrangular slat-bearing frame of my improved register or ventilator, which frame comprises two sheet-metal channel-bars D, arranged at opposite ends, respectively, of and supporting the slats. The bars D are arranged at or approximately at a right angle to the slats B. The slat-bearing frame also comprises two other sheet-metal channel-bars E, which are arranged at opposite ends, respectively, of the slat-supporting bars D and parallel or approximately parallel with the slats.

The slat-bearing frame is reinforced at the corners and interiorly by angle-plates G—that is, an angle-plate G is arranged at each interior corner formed between the adjacent ends of adjacent bars of the slat-bearing

frame with one of the wings of the said angle-plate riveted, as at G′, to one of the said bars and with the other wing of the said angle-plate riveted, as at G², to the other of the said bars. Each angle-plate G is provided at its outer end—that is, at the outer side of the space surrounded by the slat-bearing frame—with a laterally and inwardly projecting ear *g*, which has a screw-threaded hole *g′*, (see Fig. 5,) and the face-plate A is provided in registry with the said hole *g′* with a hole *a*, which is countersunk to receive the head of a screw *f*. The screws *f* extend through the face-plate and engage the correspondingly-threaded holes *g′* formed in the ears *g* of the angle-plates G. The face-plate is therefore removably secured to each angle-plate G at the outer end of the angle-plate.

Each channel-bar D is provided at its inner side with two laterally and inwardly projecting flanges *d* and *d′*, arranged at the outer side and inner side, respectively, of the space surrounded by the slat-bearing frame, which flanges extend longitudinally of the bar.

Each channel-bar E is provided at its inner side with two laterally and inwardly projecting flanges *e* and *e′*, arranged at the outer side and inner side, respectively, of the space surrounded by the slat-bearing frame and extending longitudinally of the bar.

The flanges *d* and *e* of the bars D and E, respectively, are arranged next adjacent to the inner side of the face-plate A, which consequently abuts against the outer sides of the said flanges.

Each angle-plate G extends from the outer flanges *d* and *e* to the inner flanges *d′* and *e′* of the adjacent bars D and E, respectively, being arranged between the outer and inner flanges of each of the said bars, and the ear formed upon the said angle-plate is arranged next adjacent to and overlapped at its outer side by the said outer flanges *d* and *e*, which consequently extend over the outer side of the said ear and are snugly interposed between the said ear and the face-plate A. The outer flanges *d* and *e* of the bars D and E obviously, therefore, afford bearing to the inner side of the face-plate and also afford bearing to the outer sides of the ears of the angle-plates.

The inner flanges *d′* of the slat-supporting bars D project first laterally and inwardly and then outwardly, as at *d²*, in the direction of the outer side of the space surrounded by the slat-bearing frame, with the outwardly-projecting portions *d²* of the said flanges affording bearing to the trunnions *b* of the slats B, and the last-mentioned and trunnion-bearing portions of the flanges *d′* of both slat-supporting bars D possess enough springiness to render them capable of yielding laterally independently of the remaining portions of the said bars by pressure exerted against the inner sides of the said flanges, so as to accommodate the springing of the slat-bearing bars into position between the said trunnion-bearing portions of the said flanges during the assemblage of the parts, and thereby bring the said trunnions into engagement with the circular trunnion-receiving holes *d³* formed in the said yielding members *d²*, which are arranged at a right angle to the trunnions. Obviously a slat can be readily removed, if necessary for any reason, by spreading apart the yielding portion *d²* of the flanges *d′* of the slat-supporting bars by pressure exerted against the opposing sides of the said flanges. It will be observed that the surrounding wall of each hole *d³* surrounds the engaging trunnions *b*, as shown in Fig. 9, and that the portions *d²* of the bars D prevent displacement of the trunnions outwardly toward the face-plate.

I would here remark that the thickness of the sheet-metal parts of my improved register or ventilator is shown exaggerated in the drawings.

The inner flanges *e′* of the bars E (see Fig. 6) form stops arranged to limit the turning of the slats in actuating them from their open into their closed position.

A sheet-metal slat-actuating bar K is arranged between the trunnion-bearing portion *d²* of the flange *d′* of one of the slat-supporting bars D and the face-plate A and extends longitudinally of the said flange. The slat-actuating bar K is consequently arranged at the inner side of and extends longitudinally of the adjacent slat-supporting bar D and extends across the outer sides of the arms B′, formed upon the adjacent ends of the slats B. The arms B′ of all the slats B are arranged in line edgewise and project laterally in the same direction, and the slat-actuating bar K is provided with a laterally and inwardly projecting flange *k*, which extends longitudinally of the bar and is arranged to overlap the adjacent edges of the slat-arms, which flange materially stiffens and reinforces the said bar and forms a guard, affording protection to the said arms.

The slats B are pivotally or operatively connected to the slat-actuating bar K, as already indicated, and the pivotal or operative connection between each slat and the said bar (see Figs. 4, 6, and 8) comprises a pin L, which extends through the slat-actuating bar and loosely through the arm B′ of the said slat and is provided between the said arm and bar with an annular shoulder or diametrical enlargement *l*, which pin is upset, as at L′, at the outer side of the slat-actuating bar. The pins L, establishing operative connection between the slats and the slat-actuating bar, are of course parallel with the trunnions or axes of the said bars.

A sheet-metal oscillatory segment R, in-

strumental in the operation of the slat-actuating bar K, (see Fig. 7,) is arranged between the said bar and the adjacent slat-supporting bar D and located centrally between the ends of the last-mentioned bar, to which the said segment is pivoted above, but in close proximity to the flange d' of the said bar, with the pivotal connection between the said segment and the said bar D formed by a pin P', which is arranged parallel with the slat-trunnions b and extends loosely through the segment and through the said bar D. The pin P has a head p overlapping the inner side of the segment K, which pin is upset, as at P', at the outer side of the segment-supporting bar D.

A spring S is mounted and confined upon the pin P between the segment and the adjacent or inner side of the segment-supporting slat-bearing bar D. The spring S maintains the segment in frictional contact with the head p of the pin P, and consequently there is enough frictional engagement between the head of the segment and the said pin to deter the segment from accidentally turning on the said pin. The spring S consists, preferably, of a sheet-metal piece arched or bowed centrally between its ends and having both end portions converging toward their free extremities and loosely embracing the pin P, so as to cause the said sheet-metal piece not only to operate as a spring, but to be positively retained in place between the segment R and the segment-supporting slat-bearing bar D. The segment R is offset inwardly above the pin P, and the inwardly-offset or upper portion of the segment extends upwardly into an aperture or opening A^2, with which the face-plate A is provided to accommodate the operation of the said segment. The segment R is provided within the opening A^2 (see Fig. 7) with a laterally and outwardly projecting flange r, which is arranged concentrically of the axis of the segment, which flange is corrugated transversely to render it capable of being readily operated by the application of the foot of the operator.

The segment R is operatively connected with the slat-operating bar K, and the operative connection between the said bar and the said segment preferably comprises a pin T, which loosely engages a slot R', formed centrally in and arranged radially of the inwardly-offset portion of the segment. The pin T extends through the slat-actuating bar K and is provided between the said bar and the segment with an annular shoulder or diametrical enlargement t, and the inwardly-offset portion of the segment is preferably indented inwardly, as at R^2, around the pin T, to accommodate the reception of the said shoulder or enlargement of the said pin almost or approximately flush with the inner surface of the inwardly-offset portion of the segment. The pin T is upset at its inner end, as at T', at the inner side of the slat-actuating bar K.

By the construction hereinbefore described it will be observed that there is no liability of the slat-actuating bar becoming disconnected from the arms B' of the slats, nor is there any liability of the segment R becoming disconnected from the slat-actuating bar.

The construction is simple, strong, and durable, and the number of parts required to support and retain the slats is reduced to a minimum.

What I claim is—

1. A register or ventilator comprising a plurality of parallel slats provided with trunnions at the ends; a frame surrounding the space in which the slats are located and comprising two sheet-metal bars which are arranged at opposite ends respectively of the slats and have flanges which project first laterally and inwardly and then outwardly in the direction of the outer side of the aforesaid space, with the outwardly-projecting portions of the flanges provided with circular holes engaged by the aforesaid trunnions, and with the last-mentioned and trunnion-bearing portions of the flanges of both bars possessing enough springiness to render them capable of yielding laterally independently of the remaining portions of the bars.

2. A register or ventilator comprising a slat-bearing frame composed of four sheet-metal channel-bars arranged as required to form a quadrangular frame, with each bar provided at the inner side with two flanges projecting laterally and inwardly from the bar at the outer side and inner side respectively of the space surrounded by the frame, which flanges extend longitudinally of the bar; angle-plates arranged at the interior corners formed by the bars, with each angle-plate having its wings overlapping the inner sides of and secured to the two adjacent bars, said angle-plate extending between the flanges of each of the last-mentioned bars and provided with a laterally and inwardly projecting ear which is arranged at the outer side of the aforesaid space and at the inner sides of the flanges formed on the last-mentioned bars at the outer side of the said space, and a face-plate extending over the outer sides of the outer flanges of the bars and secured to the ears of the angle-plates.

3. A register or ventilator comprising a slat-bearing frame composed of four sheet-metal channel-bars arranged as required to form a quadrangular frame, with each bar provided at the inner side with two flanges projecting laterally and inwardly from the bar at the outer side and inner side respec-

tively of the space surrounded by the frame, which flanges extend longitudinally of the bar; angle-plates arranged at the interior corners formed by the bars, with each angle-plate having its wings overlapping the inner sides of and secured to the two adjacent bars, said angle-plate extending between the flanges of each of the last-mentioned bars, and a face-plate extending over the outer sides of the outer flanges of the bars and secured to the angle-plates.

In testimony whereof I sign the foregoing specification in the presence of two witnesses.

FREDERIC G. NICOLAUS.

Witnesses:
C. H. DORER,
B. C. BROWN.