

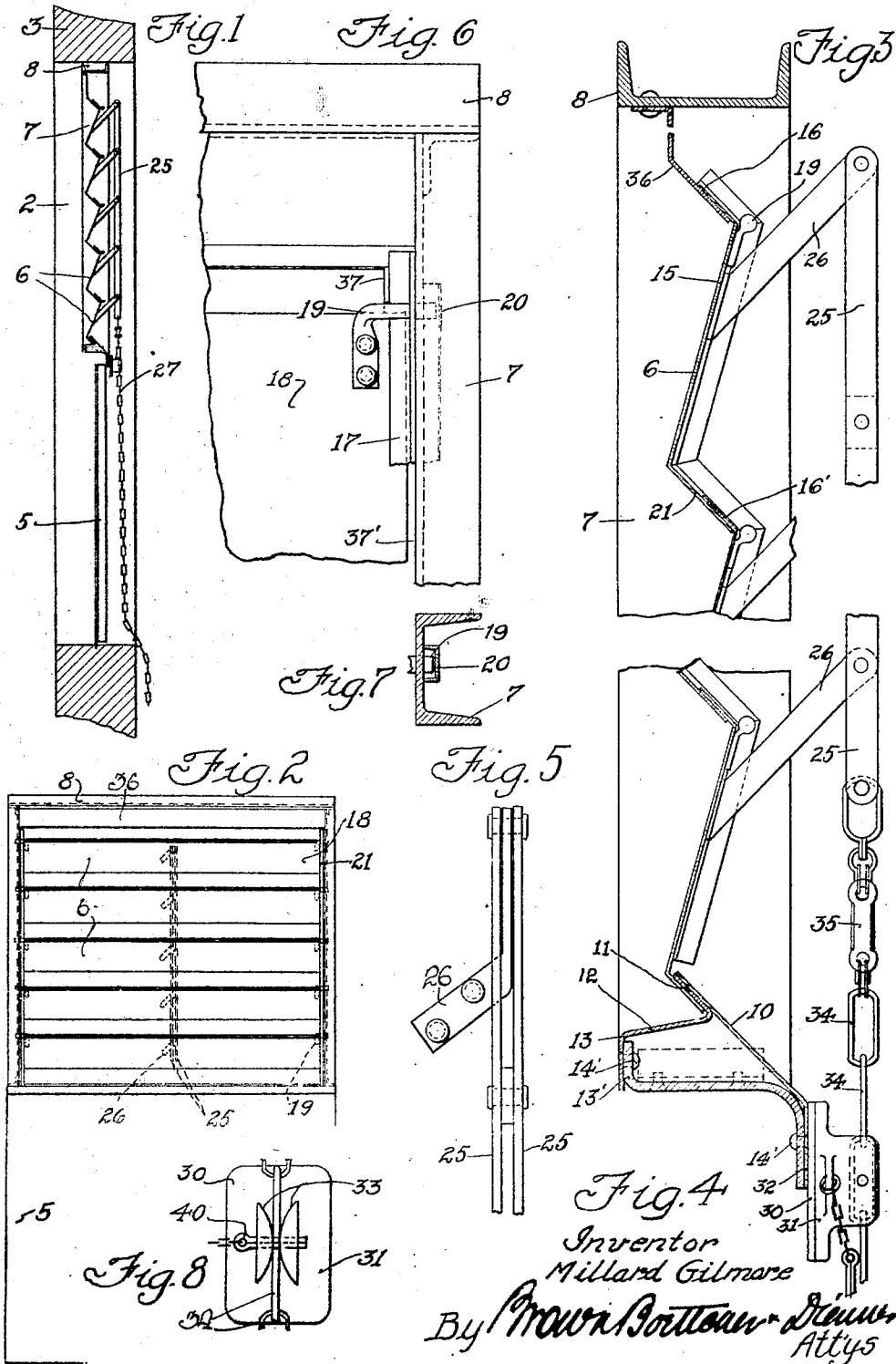
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M. GILMORE

LOUVER

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UNITED STATES PATENT OFFICE.

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LOUVER.

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To all whom it may concern:

Be it known that I, MILLARD GILMORE, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Louvers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to louver construction.

In many types of buildings, such as grain elevators, and other industrial constructions, fire shutters known as louvers are commonly employed for closing openings, particularly ventilator openings. In many places, modern fire ordinances requires the installation of such louvers. These louvers are commonly pivoted so that they will swing outwardly to provide the desired ventilation and are controlled by a single operating member for locking them in open and in closed positions.

The matter of controlling the ventilator opening to prevent a driving rain, fire, dirt and the like from striking therethrough has presented a practical and difficult problem. Not only is it necessary to mount the louvers so that they prevent foreign matter from entering the building, but it is also important that this mounting will allow the louvers to open under internal pressure, such for instance, as would be engendered by an explosion of dust or the like within the elevator. That is to say, it often becomes necessary that they serve as a safety valve, opening up when the pressure on the inside becomes great enough, and then dropping back by gravity to closed position after the pressure is relieved. The ventilator openings are never of standard size. The louver construction, including the sash members, are built to fit the openings.

An object of my invention is the provision of a louver construction having a "take-up iron" or baffle plate to compensate for any space of the ventilator opening less than that covered by a single louver. This permits the various parts of the louver construction to be made in standard sizes, and facilitates the assembly thereof inasmuch as the

baffle plate may be readily cut at the place, if desired, in order to allow for any slight variation not previously accounted for.

A further object is to construct the louvers with inwardly extending edges so that those of the adjacent louvers serve as effective baffles to keep out a driving rain when open or closed, or to prevent a draft between the edges when closed.

A still further object is to provide a louver mounting for carrying each louver so that an internal pressure will open them momentarily to afford relief, and an external pressure will increase the engagement of the louvers when in closed position.

A further object is to provide a novel form of construction embodying means for safeguarding against the passage of fire between the louvers, or for closing the louvers when the temperature becomes excessive, either on the inside or on the outside of the building.

A further object is to design this louver construction dust proof on the inside to prevent a charge of dust from accumulating and causing an explosion capable of setting larger charges of dust elsewhere in the building into action. This dust shedding feature results from sloping the inside surfaces so that the dust may not lodge upon any part of the construction.

A further object is to provide a louver that will remain closed normally, but which must be locked to remain in open position.

A further object is to provide for expansion of the parts, so that in case of fire the louvers will remain closed and prevent the passage of flames therebetween.

A further object is the provision of an improved, compact and effective device of simple and inexpensive construction.

In order to apprise those skilled in the art how to construct and practice my invention, I shall now describe a preferred embodiment thereof in connection with the accompanying drawings; in which:

Figure 1 is a vertical section through a wall of a building having my improved louver construction embodied in a ventilator opening;

Fig. 2 is an elevation of the louver construction;

Fig. 3 is a fragmentary enlarged detail view illustrating the interlapping relation of the inwardly extending edges of the adjacent louvers, and also the manner of mounting the "take-up" iron;

Fig. 4 is a similar view, but of the sill construction;

Fig. 5 is a fragmentary enlarged detail view of the operating members;

Fig. 6 is a fragmentary enlarged elevation illustrating a pivot pin mounted at the ends of each louver;

Fig. 7 is a detail view illustrating the cover for the ends of the louver pivot pins; and

Fig. 8 is a front view of the lock plate.

Referring to the drawings, the preferred embodiment of my invention is illustrated as mounted in an opening 2 of a wall 3. In this disclosure the opening is considerably larger than the louver construction, and a steel sash 5 receiving a door or the like is provided directly below the same to close off the remaining part of the opening. However, it is to be understood that the louver construction is independent of the sash 5.

The louvers 6 are carried in a frame comprising the vertical channels 7 and the upper horizontal channel 8, which are suitably secured in the opening 2 of the wall 3. The sill member 9 of this frame is formed with a downwardly sloping inner plate 10, to which is secured a chain lock plate 30 to be later described. Connecting to the upper end of the inner plate 10, as by welding, or the like, is a ledge member 12 having a face 11 slightly turned outwardly for receiving the lower edge of the lowermost louver 6. A base plate 14 connects the ledge member 12 with the inner plate 10 by suitable fastening means, such as rivets 14'. An overhanging flange 13 on the ledge 12 lies flat against an upstanding flange 13' on the base plate 14, and one of the rivets 14' passes therethrough. The inner plate 10 likewise has a flange 10' for engaging a flange 29 on the base plate 14 so that the other rivet 14' may connect these members together. Thus the sill is made rainproof. This construction may vary each time, according to the requirements of the particular opening in which the louvers are mounted.

The louvers, commonly known as slats 6, are divided into three portions each, the middle portion constituting the greater part of the louver, while the end portions turn in opposite directions in order to overlap with the ends of the adjoining louvers. In Fig. 3, I have shown an enlarged slat in cross section, having the middle portion 15 slanting slightly inwardly. The upper end 16 is turned outwardly while the lower end 21 is turned inwardly to overlap with the upper end 16' of the next louver. Where the

upper end 16 joins the middle portion 15, a trunnion or pivot pin 19 is suitably secured, which pivot pin 19 projects past the edge of the louver and journals in the vertical channel 7. A cover 20 is furnished for the end of the pivot pin 19 to protect it from interference by objects accumulating within the channel 7; or dirt or other substances affecting its journaled relation. It is to be noted that the cover 20 is substantially the entire length of the louver opening and serves to protect the pivot pins 19 journaled in either one of the channels 7.

Louvers 6 are mounted to have parallel movement. The lower end 21 engages with the upper end of the louver below, against the outside face, so that the latter serves as a stop for the former and permits an external pressure to increase the engagement to eliminate any possible drafts, or the admission of dirt, or a driving rain. The pivot pin 19 is disposed above the center of gravity of each louver in order that the lower end thereof will tend to swing downwardly to closed position automatically. The proportion of the various divisions of the louvers is to be particularly noted, as it uniquely permits the louvers to unbalance and obtain a suitable interlocking engagement with each other. This locking engagement cannot be destroyed by an external force inasmuch as the lower ends 21 push inwardly and the upper ends 16 are pushed outwardly against each other, and the vertical edges of each louver strike against the angle irons 17 carried on the side channels 7. The upper end of each louver is cut away as shown at 37 in Fig. 6 in order that it may clear the angle irons 17. The irons 17 provide a tight closure at the sides when the louvers are closed. A space 37' is provided between the slats 18 and the side angle irons 17, so that bodily expansion of the slats, due to fire or other unusual heat, will not interfere with their operation.

Substantially intermediate the sides of the louvers are a pair of parallel connecting members 25, connected to carry, in pivotal relation, a plurality of links 26 which suitably connect with the louvers 6. Each link 26 is bent at its lower end, so that it lies parallel to and flatly against the connecting louver. It will thus be seen that vertical movement of the connecting members 25 will pivotally swing the louvers either inwardly of upwardly to close or open the opening 2. To swing them outwardly, the connecting members 25 are pulled downwardly by means of the chain 27 adapted to be manually operated. A chain lock is provided to hold the louvers 6 in open position by locking the connecting members 25 in lower position. This lock comprises a plate 30 secured to the inner sill plate 10 and a second plate 31 preferably attached to the

plate 30 by a rivet 32. The plate 31 is provided with a pair of lugs 33 spaced apart substantially the thickness of the links 34 of chain 27 extending from the lower end of connecting members 25. The louvers may be held open in any position within a limited range by changing the link engaged between the lugs 33. A key pin 40 is loosely hung from the plate 30 as shown in Fig. 4, for passing thru the lugs 33 and link, so that the chain 27 will not accidentally slip from between the lugs.

Upon an occurrence of a fire or a predetermined rise in temperature, the pivoted louvers 6 are released from their open position, by melting of the fusible member 35. The louvers fall into closed position by gravity and are substantially interlocked so that the fire cannot creep between the edges of the louvers. It is to be noted that each louver is arranged to expand in all directions in order to prevent distortion by fire.

As before mentioned, the openings 2 vary in size, in many instances, which requires that the number of louvers 6 be varied. However, quite frequently, it happens that a space is left which is less than the height of a louver, such an instance being shown in Fig. 3. To provide for this contingency, a take-up iron or baffle plate in form of a Z bar 36 is furnished. This bar 36 is suitably bolted, or otherwise secured, to the upper member so that its lower end extends downwardly to engage with the upper end 16 of the uppermost louver 6. Thus the louvers may be assembled by beginning with the lowermost one and building upwardly until the last one is put in place. If any space is left, the baffle plate may be then employed to close this space and provide a complete closure for the opening 2. The particular shape of the baffle plate 36 permits it to be readily adaptable to the space above the uppermost louver. By being vertical, the leg 36' not only allows a maximum space to be taken up by the baffle plate, but also presents a dust shedding surface.

When the louvers are in closed position, the connecting members 25 will loosely hang from the links 26. The louvers close under their own weight about their unbalanced mounting as soon as the chain 27 is released from between the lugs 33, the ends of each louver serving as an effective baffle to prevent the entry of a driving rain. It is to be noted that the louvers are free to swing outwardly by an internal pressure, which is caused, quite frequently, by an explosion of dust in grain elevators. As soon as the pressure is relieved, the louvers drop back automatically to closed position. This arrangement notably causes the engagement of the louvers to increase when any pressure comes against them in the opposite direction, that is, from on the outside of the building.

Fire striking through the louvers, when opened, will fuse the link 35 and the chain 27 being caught between the lugs 33 when the louvers are in this position will immediately release the connecting members 25 and allow the louvers to drop to lower position.

One particular advantage will be noted in the fact that upper ends 16 and lower ends 21 of the adjacent louvers are bent at such an angle that when the louvers are opened, the edges of these ends are in overlying relation, that is in planes which overlie each other. Consequently, a driving rain or snow can not pass between the louvers.

I do not intend to be limited to the particular details shown, as it will be apparent that various modifications may be made without departing from the scope of the invention. For instance, the louvers may be of different sizes in lieu of the louvers shown, or the take-up iron may be disposed at a different point in the opening 2.

I claim:

1. In combination, a wall having an opening, a plurality of shutters extending across and adapted for closing said opening, the upper and lower ends of said shutters being turned in opposite directions and the upper ends of each adapted for overlapping the lower ends of adjacent shutters, a pivot for each shutter disposed above the center of the vertical dimensions thereof and adjacent the bases of the upper turned out ends on the side of the shutter opposite that toward which the adjacent end of the shutter is turned, and means attached to the upper ends of the shutters adjacent said pivots for swinging the shutters open.

2. In combination, a wall having an opening, a plurality of shutters extending across and adapted for closing said opening, the upper and lower ends of said shutters being turned in opposite directions, and the upper ends of each adapted for overlapping the lower ends of adjacent shutters, a pivot for each shutter disposed above the center of the vertical dimensions thereof and adjacent the bases of the upper turned out ends on the side of the shutter opposite that toward which the adjacent end of the shutter is turned, and closure members vertically along opposite ends of the shutters, the length of the upper turned out shutter ends in the direction of the distance between said closure members being less than said distance to permit swinging of the upper turned out ends therpast.

3. In combination, a wall having an opening, a plurality of shutters each having stationary pivotal support and adapted for closing said opening, the pivots for the shutters being disposed adjacent the upper ends thereof and the shutters being unbalanced to close by gravity, means for opening the shutters, said means comprising an operat-

ing link, a plurality of links connected between said first link and the upper ends of each shutter adjacent their pivotal mountings, a flexible element extending from said first link for operating same, means cooperating with said flexible element for holding the shutters closed and a fusible link connected between the locked portion of said flexible element and said first operating link and fusible to release the operating means and permit the shutters to close. 10

In witness whereof, I hereunto subscribe my name this 7th day of July, 1922.

MILLARD GILMORE.