

No. 816,080.

PATENTED MAR. 27, 1906.

B. C. DONNELLY.
FIRE SHUTTER.

APPLICATION FILED MAR. 7, 1905.

2 SHEETS—SHEET 1.

Fig. 2.

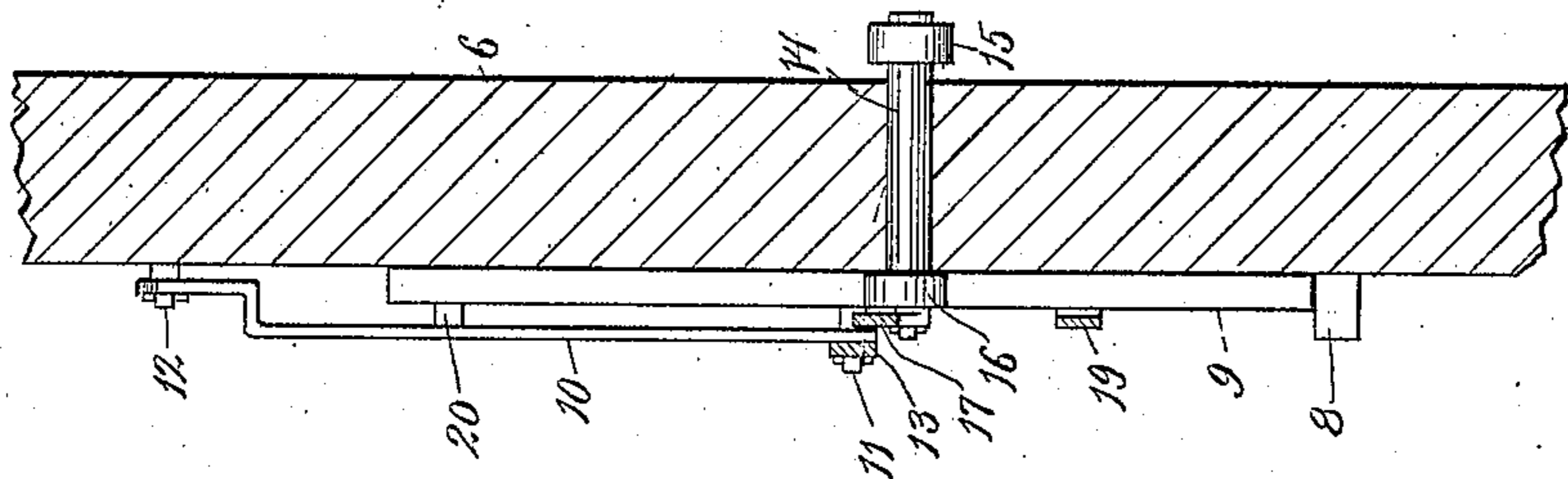


Fig. 1.

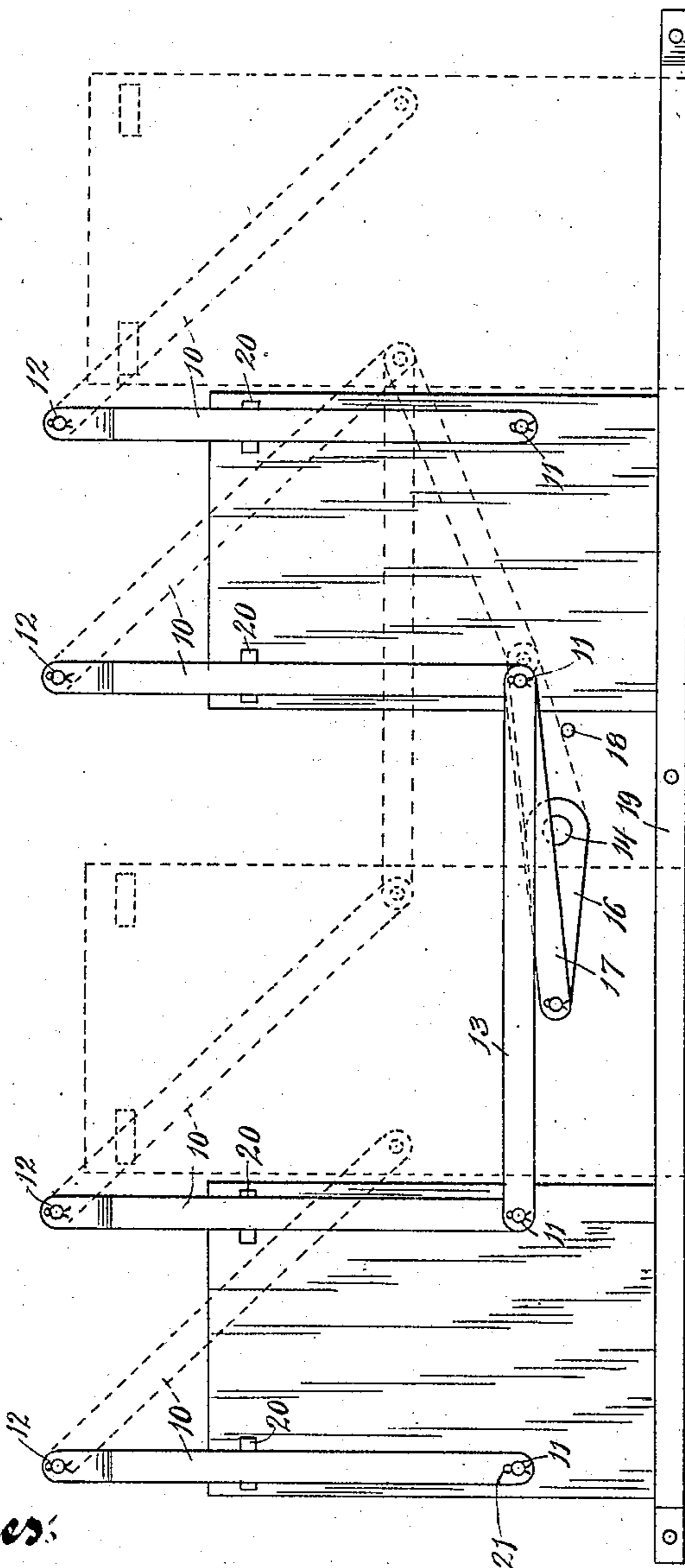
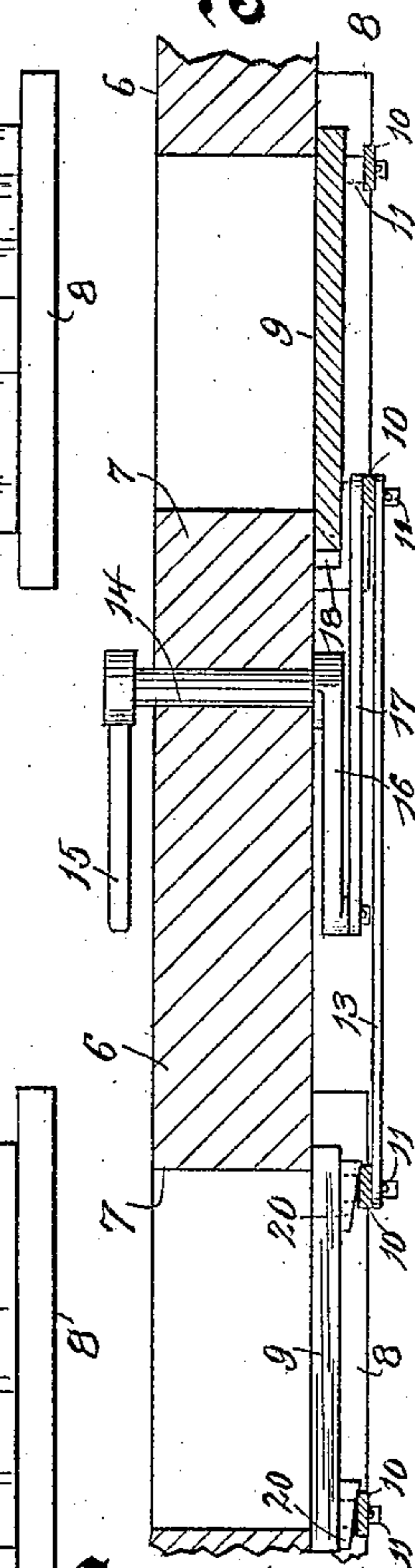


Fig. 3.



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2 SHEETS—SHEET 2.

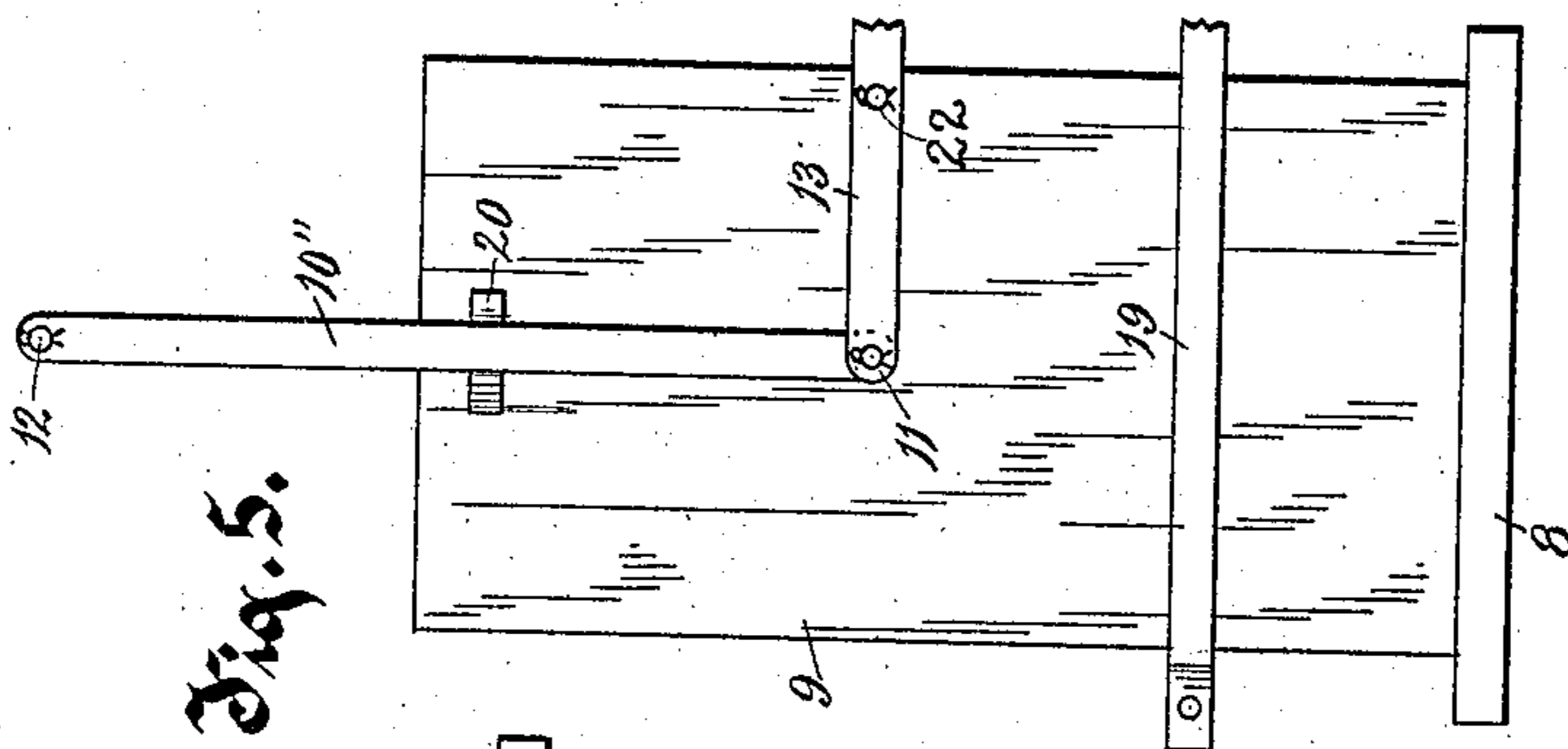


Fig. 5.

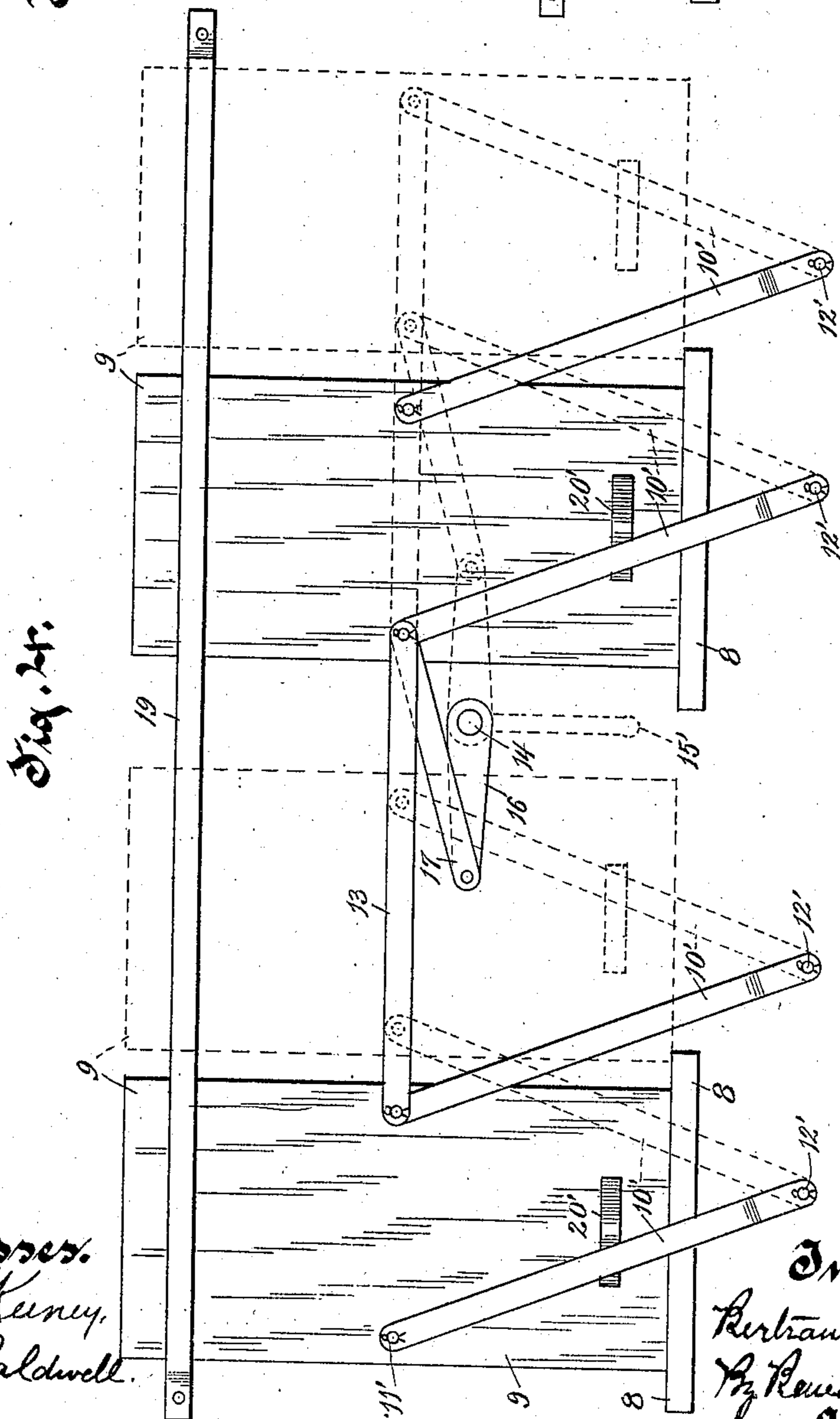


Fig. 24.

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UNITED STATES PATENT OFFICE.

BERTRAM C. DONNELLY, OF ST. JOSEPH, MISSOURI.

FIRE-SHUTTER.

No. 816,080.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed March 7, 1905. Serial No. 248,823.

To all whom it may concern:

Be it known that I, BERTRAM C. DONNELLY, residing in St. Joseph, in the county of Buchanan and State of Missouri, have invented new and useful Improvements in Fire-Shutters, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to fire-shutters, and has for its object to provide a fireproof covering for windows and the like which may be readily operated to cover the window-openings and effectively prevent fire communication from one building to another through the windows.

An object of this invention is to provide means for automatically tightening the fire-shutter against the window-opening when closed, and thus prevent the passage of air, which would tend to increase the draft on a fire within the building.

Another object of this invention is to provide suitable means for simultaneously operating the fire-shutters of two or more windows by a mechanism which will be simple in its construction and easy to operate.

With the above and other objects in view the invention consists in the devices, their parts, and combinations of parts, as herein set forth, and the equivalents thereof.

Referring to the accompanying drawings, in which like characters of reference indicate similar parts in the several views, Figure 1 is a front elevation of fire-shutters for a pair of windows, forming one embodiment of this invention. Fig. 2 is a vertical sectional view thereof on a plane through the crank-shaft. Fig. 3 is a horizontal sectional view thereof on a plane through the crank-shaft, one of the shutters being shown in plan. Fig. 4 is a front elevation of a modified form of fire-shutters for a pair of windows, forming another embodiment of this invention; and Fig. 5 is a front elevation of a fire-shutter for a single window, constituting a still further modification of this invention.

In the drawings, 6 represents the wall of a building with window or other openings therethrough, and 8 represents the projecting sills of the windows.

In the embodiment of the invention illustrated in Figs. 1, 2, and 3 each window-opening is provided with a shutter 9, formed of a rectangular shield or screen of fireproof mate-

rial, such as sheet metal, which is suspended, by means of a pair of parallel links 10, from the wall of the building. The links 10 are pivoted to the shutter at about its middle portion and near its side edges upon pivotal pins 11, projecting therefrom, and hang from suitable projecting pivotal pins 12, secured to the wall of the building above the window-opening. The parallel links 10 are of the same length or have their pivotal connections at the same distance apart, so that the shutter 9 will remain in a vertical position at all times when swung thereon. The links are given an angular bend near their upper ends to offset said upper ends and provide a space between the main portion of the links and the wall 6, through which the shutter 9 may pass in swinging to one side of the window-opening, as shown in dotted lines in Fig. 1.

The nearest pivotal pins 11 of the two adjacent shutters are connected together by means of a connecting-bar 13, pivotally mounted thereon, which serves to couple the two shutters together, so that a movement of one will impart a corresponding movement to the other and therefore require them to move in unison.

A crank-shaft 14 is journaled through the wall 6 and is provided on its inner end inside of the wall with an operating-handle 15 and on its outer end outside of the wall with a crank 16. Crank 16 has its outer end pivotally connected by a link 17 with some portion of the coupled shutters, preferably with one of the pivotal pins 11, on which the connecting-bar 13 is mounted.

The turning of the handle 15 within the building causes the crank 16 to swing the coupled shutters 9 upon their supporting-links 10 from the position shown in firm lines in Fig. 1, where they close the window-openings, to the position shown in dotted lines, where they are located alongside of the window-openings slightly higher up. In thus swinging the shutters open the crank 16 and the link 17 pass beyond the line joining their outer ends, or what might be termed the "dead-center," so that the weight of the shutters tends to press the crank downwardly against a stop-pin 18, provided therefor in the wall 6, to keep them suspended in their open position. (Shown in dotted lines.)

A guide-rail 19 extends entirely across both window-openings and is bent out from the wall 6, to which it is connected, to form a

guide for the shutters and prevent their moving away from the building. This guide-rail is above the window-sills a sufficient distance to retain its relation with the shutters 9 when
5 they are raised to their open position and serves to guide them in their movements from one position to the other.

Each shutter 9 is provided near its upper end with a pair of wedge-blocks 20, which are
10 tapering in form to engage the links 10 with a cam action as the shutters approach their closed position. By pressing the upper end of the shutter away from the supporting-links 10 they serve to force said shutter tightly
15 against the window-opening and as far as possible prevent the passage of air therebetween.

All of the pivotal connections above mentioned are preferably made secure against disengagement by means of cotter-pins 21, as
20 shown.

In operation the shutters are normally left in their raised or open positions, as shown in dotted lines in Fig. 1, where they are entirely free from the window-openings and are located
25 alongside of them at a slightly-higher elevation, with the crank 16 held tightly against the stop-lug 18 to prevent their swinging down into their closed position. When it is desired to close the shutters in
30 event of fire or at other times, it is only necessary to swing the handle 15 over from one side to the other and so swing the crank 16, which will allow the pair of shutters to swing downwardly upon their supporting-links 10 by
35 their own weight until one shutter strikes against the bend of the guide-rail 9. In this position the shutters hang naturally from their swinging support and effectively close the window-openings, being jammed there-
40 against by the cam action of the wedge-blocks 20. It is obvious that the reverse operation of the crank-handle 15 will restore the shutters to their open position, the two of them always moving in unison with their
45 parts and connections in parallelism.

In the embodiment illustrated in Fig. 4 the shutters 9 are similarly mounted upon pairs of parallel links 10', but instead of being suspended from above these links have their
50 connections with the wall 6 located below the window-openings. The operation of the shutters in this construction is practically the same as the operation of the construction above described; but their movement is more
55 nearly horizontal, and their final open position is alongside of the window-openings on the same level therewith. In this construction the two shutters are coupled by the connecting-bar 13, as before, and the connecting-
60 link 17 similarly connects them with crank 16 on the shaft 14; but here the handle 15' preferably extends downwardly in the closed position of the shutters and is swung to an upwardly-extending position in opening the
65 shutters. No stop-lug is required for the

crank 16 in this construction, since the shutters may rest upon the sills 8 in their open as well as in their closed positions, or the engagement of one shutter with the bend of the guide-rail 19, which is here located near the
70 upper ends of the windows, may be relied on to prevent the shutters moving beyond their open position. (Shown in dotted lines in Fig. 4.) A single wedge-block 20' is located
75 on each shutter for engaging one of the links 10 to tighten the shutter against the window opening when closed, and this is located near the bottom of the shutter at the middle thereof.

In Fig. 5 is shown a single shutter, which
80 is suspended from above by a single link 10'', connected near the central point of the shutter and slightly thereabove instead of by the pair of parallel links, as shown in Fig. 1. In this form of fire-shutter the wedge-block 20
85 and the guide-rail 19 are provided, as in the other constructions; but the operating-rod 13' is bolted to the edge of the shutter 9 at 22 to keep said shutter in its upright position. It is obvious that the shutter may also be sup-
90 ported by a single link from below in the same manner.

The invention provides a simple and efficient fire-shutter which will be cheap to construct and install, which will be durable and
95 not liable to get out of order, and which may be quickly and easily operated by any one to effectively close one or more windows in case of fire and prevent the fire passing through the windows from one building to another or
100 from one portion of a building to another. This fire-shutter also securely seals the window against the passage therethrough of a considerable draft, which might increase the intensity of a blaze within the building. It
105 is obvious that the rock-shaft 14 may be operated from the outside of the building when convenient access may be had thereto.

What I claim as my invention is—

1. A fire-shutter for buildings, comprising
110 a pair of shutters, links connecting the shutters with the building upon which links the shutters may be swung from one position to another to open and close window-openings, a connecting-bar coupling the shutters to-
115 gether, a crank-shaft mounted on the wall of the building and having connection with the coupled shutters by which the shutters may be swung, and a guide-rail secured to the building and extending at a slight distance
120 therefrom to guide the shutters in their movements.

2. A fire-shutter for buildings, comprising a pair of shutters, links connecting the shutters with the building upon which links the
125 shutters may swing from one position to another to open and close window-openings, a connecting-bar coupling the shutters together so that they move in unison, a crank-shaft mounted on the wall of the building
130

and having connection with the coupled shutters, and means for tightening the shutters against the wall of the building as the shutters close the window-openings.

5 3. A fire-shutter for buildings, comprising a pair of shutters, links pivotally connected to the shutters and to the building by which the shutters may be swung from one position to another to open and close window-openings, a connecting-bar coupling the shutters together so that they move in unison, a crank-shaft mounted on the wall of the building and having connection with the coupled shutters by which they may be moved from 10 one position to another, and wedge-blocks on the shutters to be engaged by the links as the shutters swing to their closed positions and thereby force the shutters tightly against the wall of the building around the window-openings. 20

4. A fire-shutter for buildings, comprising a pair of shutters, parallel links connecting the shutters with the building on which links the shutters may be swung from one position to another to open and close window-openings, a connecting-bar coupling the shutters together, a crank-shaft journaled through the wall of the building, a crank on the crank-shaft, a link connecting the crank to the coupled shutters, a handle on the crank-shaft inside the wall of the building, and a stop-lug on the wall of the building for engaging the crank after the crank and its link have passed their dead-center and the shutters are in their 30 open position. 35

5. A fire-shutter for buildings having window-openings, comprising a pair of shutters, a pair of parallel links connecting each shutter with the wall of the building above the window-openings on which links the shutters may be swung from one position to another to open and close the window-openings, a connecting-bar coupling the shutters together, a crank-shaft journaled through the wall of the building, a crank on the crank-shaft, a link connecting the crank with the connecting-bar, a stop-lug on the wall of the building for limiting the movement of the crank, an operating-handle on the crank-shaft inside of the wall of the building, wedge-blocks on the shutters engaging the supporting-links as the shutters close to force the shutters away from the supporting-links against the wall around the window-openings, and a guide-rail extending across the window-openings at a distance from the wall to guide the shutters in their movements. 45 50 55

6. A fire-shutter for buildings, comprising a shutter, parallel links connecting the shutter with the wall of the building on which links the shutter may be swung from one position to another to open and close a window-opening, a crank-shaft journaled through the wall of the building, a crank on the crank-shaft, a link connecting the crank with the 60 shutter, a stop for limiting the movement of the crank, and a handle on the crank-shaft inside of the wall of the building. 65

shutter, a stop for limiting the movement of the crank, and a handle on the crank-shaft inside of the wall of the building.

7. A fire-shutter for buildings, comprising a shutter, a pair of links connecting the shutter with the wall of the building on which links the shutter may be moved from one position to another to open and close a window-opening, a crank-shaft journaled through the wall of the building, a crank on the crank-shaft, a link connecting the crank with the shutter, a stop-lug for limiting the movement of the crank, means for operating the crank-shaft, and wedge-blocks on the shutter for engaging the supporting-links as the shutter is closed and forcing the shutter to bear tightly against the wall around the window-opening. 70 75 80

8. A fire-shutter for buildings, comprising a shutter, a link connecting the shutter with the wall of the building above a window-opening on which link the shutter may be swung from one position to another to open and close the window-opening, means for swinging the shutter, and a wedge-block on the shutter engaging the link as the shutter closes for forcing the shutter tightly against the wall of the building around the window-opening. 85 90

9. A fire-shutter for buildings, comprising a shutter, a link connecting the shutter with the wall of the building on which link the shutter may be swung from one position to another to open and close the window-opening, a bar for swinging the shutter mounted on the connection between the link and the shutter, a wedge-block on the shutter engaging the link as the shutter closes for forcing the shutter tightly against the wall of the building around the window-opening, and a guard-rail mounted on the wall of the building and extending a slight distance therefrom to form a guide for the shutter. 95 100 105

10. A fire-shutter for buildings, comprising a shutter member, links connecting the shutter member with the building upon which links the shutter member may be swung from one position to another to open and close a window-opening, means for swinging the shutter member on the links from one position to the other, and a guide-rail secured to the building and extending a slight distance therefrom to guide the shutter member in its movements. 110 115

11. A fire-shutter for buildings, comprising a shutter member, links connecting the shutter member with the building upon which links the shutter member may swing from one position to another to open and close a window-opening, means for swinging the shutter member, and means for tightening the shutter member against the wall of the building as it closes the window-opening. 120 125

12. A fire-shutter for buildings, comprising a shutter member, links pivotally connected 130

to the shutter member and to the building
by which the shutter member may be swung
from one position to another to open and
close a window-opening, means for swinging
5 the shutter member, and wedge-blocks on the
shutter member to be engaged by the links
as the shutter member swings to its closed po-
sition and thereby force the shutter member
tightly against the wall of the building around
10 the window-opening.

13. A fire-shutter for buildings, comprising
a shutter member, parallel links connecting
the shutter member with the building on
which links the shutter member may be
15 swung from one position to another to open

and close a window-opening, a crank-shaft
journaled through the wall of the building, a
crank on the crank-shaft, a link connecting
the crank with the shutter member, a handle
on the crank-shaft inside the wall of the 20
building, and a stop on the wall of the build-
ing for engaging the crank after it has passed
its dead-center and the shutter is in its open
position.

In testimony whereof I affix my signature 25
in presence of two witnesses.

BERTRAM C. DONNELLY.

Witnesses:

DANIEL SPOERNDLI,

LOUIS KNAPP.