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A. SHUMAN.
FIRE CURTAIN FOR WINDOWS.
APPLICATION FILED MAY 28, 1908.

Patented Jan. 3, 1911.

2 SHEETS-SHEET 2.

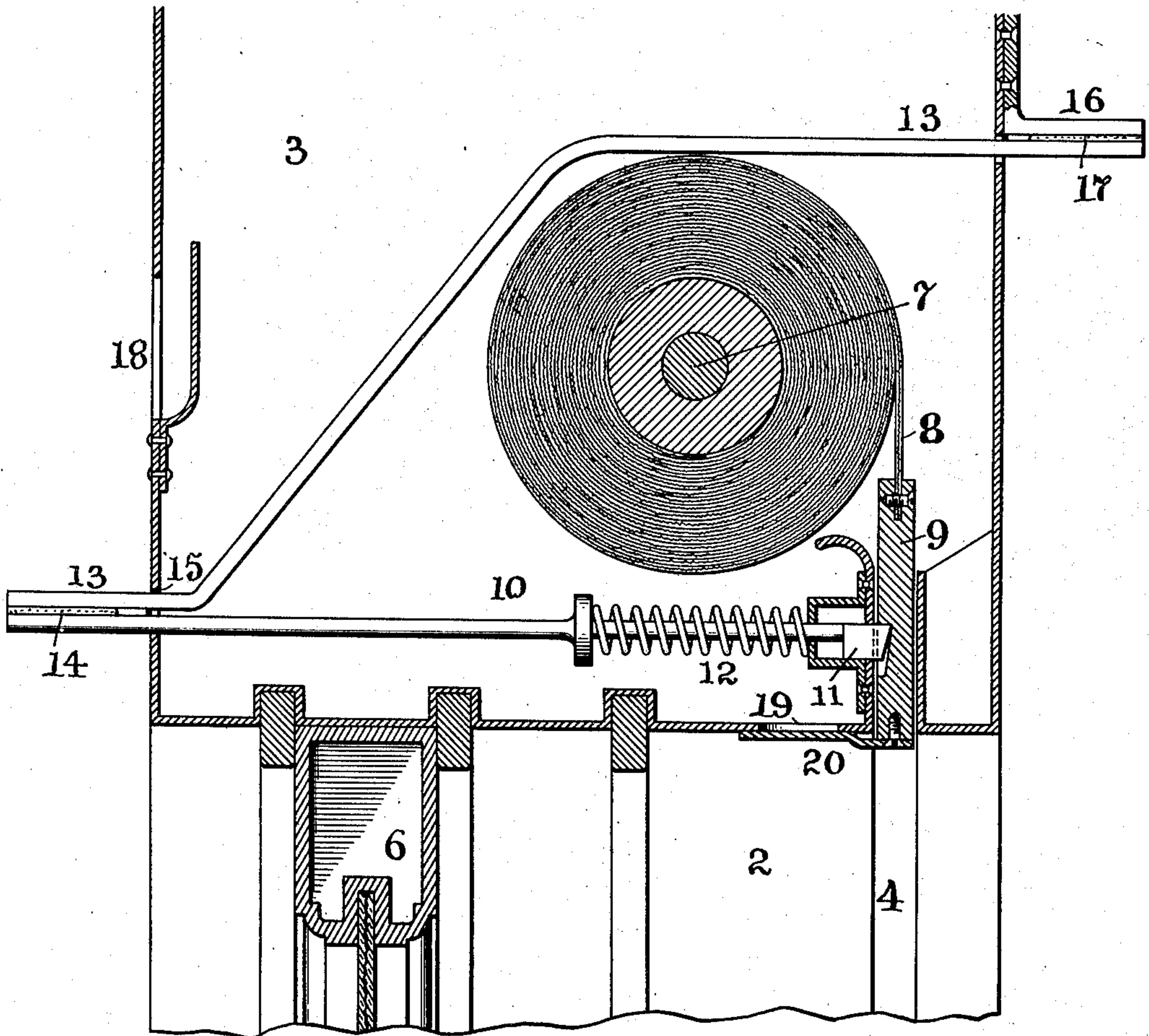
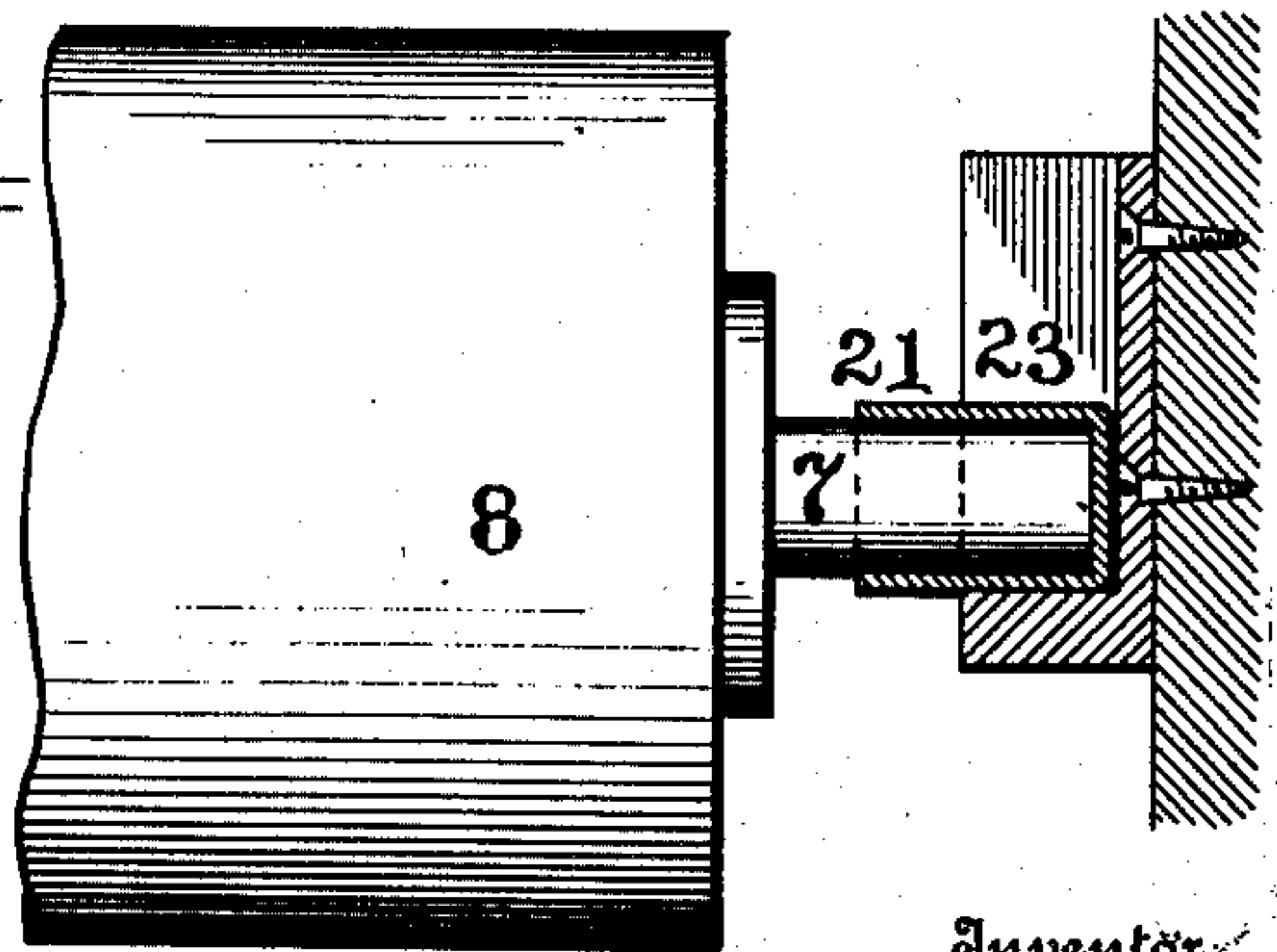


Fig. 3

Fig. 4



Inventor

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[Signature]

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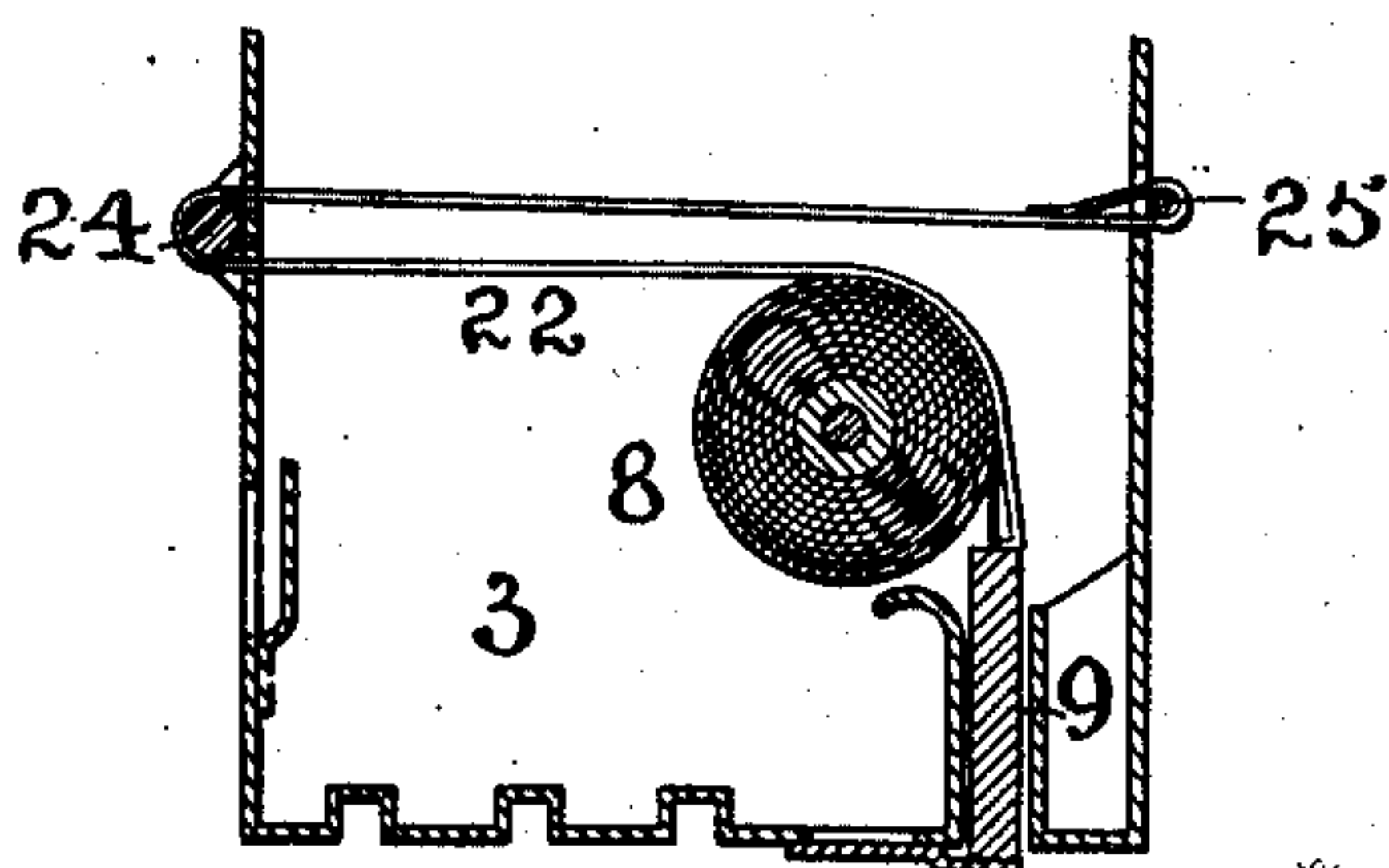


Fig. 5

Witnesses

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UNITED STATES PATENT OFFICE.

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FIRE-CURTAIN FOR WINDOWS.

980,443.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed May 28, 1908. Serial No. 435,402.

To all whom it may concern:

Be it known that I, ARNO SHUMAN, a citizen of the United States, and a resident of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Fire-Curtains for Windows, of which the following is a specification.

My invention has reference to fire curtains for windows and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

The object of my invention is to provide means to protect the interior of buildings and their contents from fire by radiant heat from the outside of the building where the windows become cracked or melted from the external heat, such for example as would occur where a fire of considerable magnitude existed across a narrow street or alley from adjacent buildings.

My object is also to provide protection against abnormal drafts in cases where the fire occurs within the building itself and under the influence of which the glass of the windows has become broken or melted.

More specifically my object is to provide an automatically controlled fire curtain or shielding device which will close or substantially close the area of the window and act as a screen against the passage of heat and flame.

My invention consists of a window frame, combined with heat resisting means to close the same, and thermally operated means for releasing the heat resisting means, whereby it automatically closes the window frame in case of excessive heat adjacent thereto.

More specifically, my invention comprises a window frame, combined with a fire curtain adapted to automatically close or substantially close the window frame, a latch device for normally holding the curtain out of shielding or sealing position, and thermally controlled means for automatically releasing the latch in case of excessive temperature adjacent to the window frame.

My invention also comprises details of construction which, together with the features above specified, will be better understood by reference to the drawings in which:

Figure 1 is a front elevation of a window embodying my invention; Fig. 2 is a vertical sectional elevation of the same; Fig. 3 is an enlarged view of the upper portion of Fig.

2; Fig. 4 is a sectional elevation showing the bearing for the curtain roller; and Fig. 5 is a cross sectional view of the upper part of the window frame and the fire curtain and showing a modified form of releasing device.

2 is the window frame and is provided at the bottom with the sill 5 and at the top with a head 3, the latter being made hollow and adapted to contain the fire curtain 8 when rolled up upon a shaft 7. The window frame is preferably made of metal, but may be of wood or made in any suitable manner, as is well known in the art.

6 represents the glazed window sashes, and these may be furnished with ordinary glass or with wire glass, as indicated, the latter being extensively employed in large buildings at the present time.

The fire curtain 8 may be made of any suitable material and in any convenient manner so long as it is heat resisting; the material which is most suitable for the purpose is an asbestos curtain having a wire center. One end of the curtain is secured to the roller of the shaft 7 and the other end is secured to a weighted end bar 9 which is guided in the vertical grooves 4 on each side of the window frame and located in the interior of the building and at some distance from the glazed sash. Both the weight 9 and the curtain 8 are sufficiently wide to extend into these grooves 4 at each side, whereby when the curtain is down, the lateral edges are shielded in the grooves and offer obstruction to the passage of heat and gases. If the roller and its curtain are freed, the weighted bar 9 will unwind the curtain and cause it to descend to close the window frame in front of the glazed sash, and the descent will continue until the bottom of the weighted bar 9 reaches the bottom of the grooves 4 at a short distance above the sill 5. When in this position, there will be a slight passage for air to pass under the curtain, thence upward between the curtain and the glazed sash, thence through the aperture 19 in the head frame 3 and finally out by the aperture 18 to the outside of the building. This current of air will tend to keep the glazed sash, as well as the curtain, cool when the fire is outside of the building. When the curtain is in its raised condition, namely, wound upon the roller as indicated in Figs. 2 and 3, a plate 20 on the bottom of the weighted bar 9 closes the orifice 19, so that at times when there is no fire the heated air of the building

will not escape. These apertures 19 may be in the form of holes similar to the apertures 18, so as not to weaken the metal of the head frame of the window frame too much. It is immaterial to my invention what means are employed for closing the apertures 19, but that shown is convenient and inexpensive and excellently suited to the purpose.

To hold the curtain from unwinding under normal conditions, I provide a suitable latch 10 consisting of a bolt 11 which normally engages a recess in the weighted bar 9, as shown in Fig. 3. This prevents the curtain and its bar from falling, but the bolt may be withdrawn automatically by the coil spring 12 to release the latch from its retaining position and permit the fall of the curtain. Normally the latch is held in its engaging position, as shown, by means of a fusible solder 14 securing the end of the latch to the bar 13 on the outside of the window frame, said bar 13 and the end of the bolt extending through the aperture 15 in the head 3 of the window frame. In this manner, the fusible solder is exposed on the outside of the building and in position to be subjected to heat from fire in an adjacent building across the street or alley, so that the fire curtain may be automatically released and closed upon the presence of excessive heat upon the outside of the window. The bar 13 is also extended through the window frame into the interior part of the building and is secured by fusible solder to a fixed bracket 16. It will now be seen that, if there was excessive heat upon the inside of the building, the fusible solder 17 would melt instead of the fusible solder 14, and under the action of the spring 12 the bolt 11 would release the curtain and its bar 9. It is evident, therefore, that the fire curtain will be automatically lowered whether the excessive temperature is upon the inside or the outside of the window, but it will be understood also that while this double capacity is desirable, it is not essential to the use of my invention. Broadly considered, it will suffice that the fire curtain be released by excessive temperature from the inside alone or from the outside alone or from both sides of the window frame.

To prevent any possibility of the journals of the roller rod 7 from rusting in their bearings and thereby preventing, by long inactivity of the curtain, its unrolling by the weight 9, I prefer to provide the ends of the iron rod 7 with caps or sleeves 21 of aluminum, copper, brass, or other normally non-oxidizable metal and which may be employed in connection with bearings 23 of similar or other materials. By this means long inactivity will not produce binding by rust, with liability to render the fire curtain inoperative at a critical moment.

In place of the release means shown in

Fig. 3 to permit the latch to release the fire curtain and bar, I employ any other suitable means such for example as is shown in Fig. 5. This comprises a strip 22 of fusible metal attached at one end to the bar 9 and extending over the roller and outward through the window frame head, thence around a bar 24 on the outside of the window frame, thence back through the window frame head and around a bar 25 on the inside of the window frame. In this case excessive heat outside of the building will rupture the fusible metal strip 22 adjacent to the bar 24 and permit the curtain to fall. On the other hand, if the excessive heat is upon the inside of the building, the fusible metal strip 22 will melt adjacent to the rod 25 and may then be drawn over the rod 24 as the weighted part 9 of the curtain falls. The operation of the device in Fig. 5 is similar in all material respects, in regard to results, as occurs with the structure shown in Fig. 3. Any other suitable means may be employed which will either liberate the curtain by excessive heat from the outside of the building alone, or by excessive heat upon the inside of the building alone, or which is adapted to operate upon the presence of excessive heat upon either the inside or the outside or both inside and outside of the building.

I have shown the curtain as adapted to be retained in its lowered position, slightly above the sill 5 to permit a current of air to pass under it and upward between the curtain and the window sash, but this is not essential and, if desired, the grooves 4 may extend down to the window sill so that the window frame is completely closed. The same result would be obtained by properly shaping the bottom of the weighted bar 9 to conform to the shape of the sill and its relation to the side frames.

I have shown the means for closing the window frame in the form of a flexible, fire-proof curtain, and while this is the most satisfactory construction for the purpose, I do not restrict myself to any particular means for closing or sealing the window frame to prevent the action of the heat from the outside to the interior of the building, or the creation of drafts from heat on the interior, as any means which may be adapted for the purpose may be employed in lieu of the means shown, without departing from the spirit of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination of a window frame and its sashes, of a movable curtain weighted to automatically close the window frame, thermally controlled means extending to the outside of the window frame for holding the weighted curtain normally in an open posi-

tion and releasing it in case of excessive heat, and means providing passages for permitting a current of air to flow from the inside to the outside of the window frame and
5 between the window sashes and the curtain when lowered.

2. The combination of a window frame having side guides and having a passage for air through its upper part to the outside of
10 the building, a curtain roller in the upper part of the window frame, a fire curtain secured to the roller and adapted to automatically close the window frame nearly to the bottom when released, and thermally
15 controlled means for holding the curtain in its elevated condition and to release same in case of excessive heat.

3. The combination of a window frame having side guides and having a passage for

air through its upper part to the outside of 20 the building, a curtain roller in the upper part of the window frame, a fire curtain secured to the roller and adapted to automatically close the window frame nearly to the bottom when released, thermally controlled 25 means for holding the curtain in its elevated condition and to release same in case of excessive heat, and means to control the air passages to prevent the escape of air from the interior of the building when the curtain 30 is fully raised.

In testimony of which invention, I have hereunto set my hand.

ARNO SHUMAN.

Witnesses:

B. W. POORD,
R. M. KELLY.