

(No Model.)

A. S. SPAULDING.
FLEXIBLE DOOR.

No. 550,652.

Patented Dec. 3, 1895.

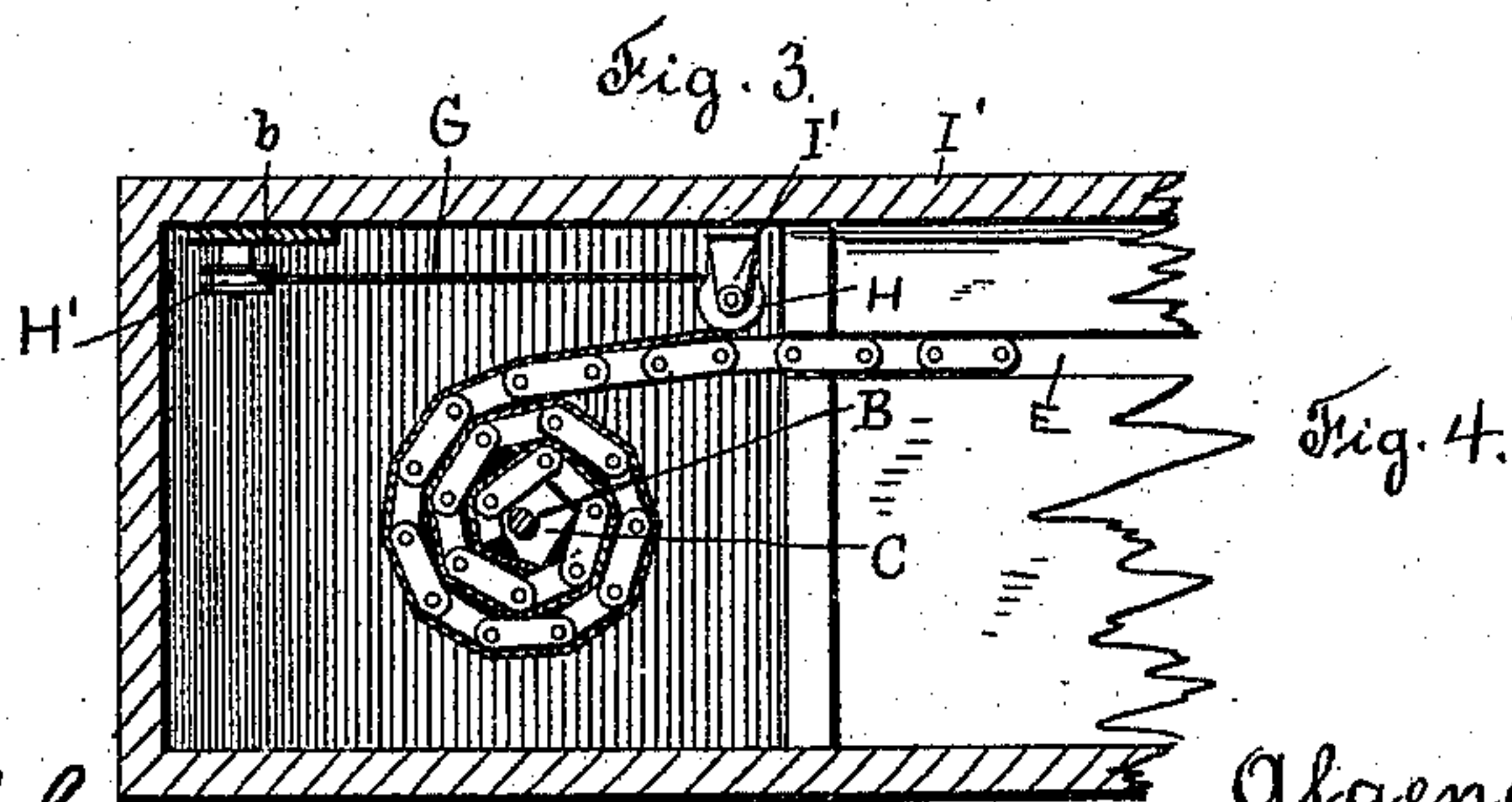
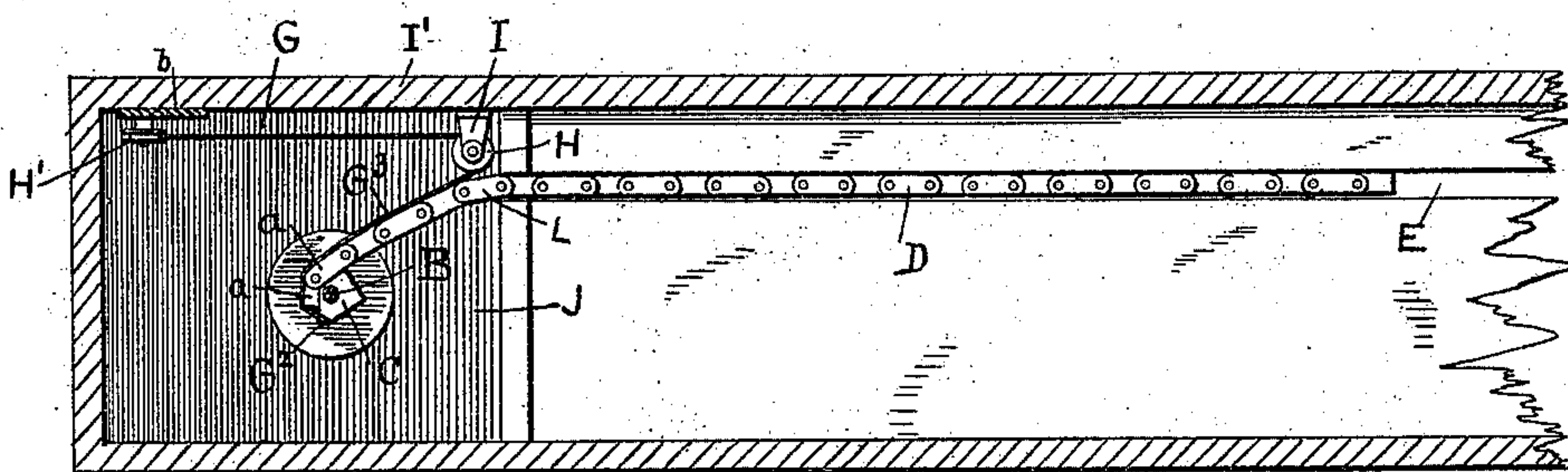
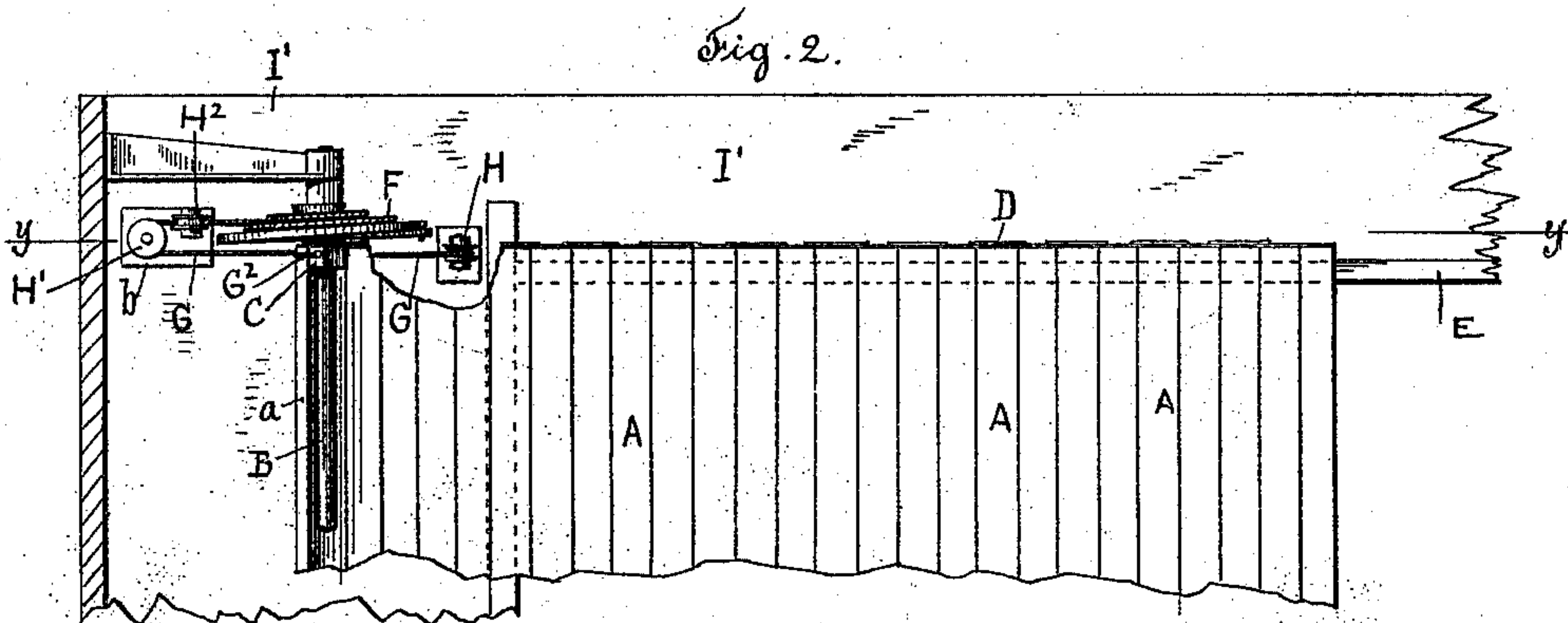
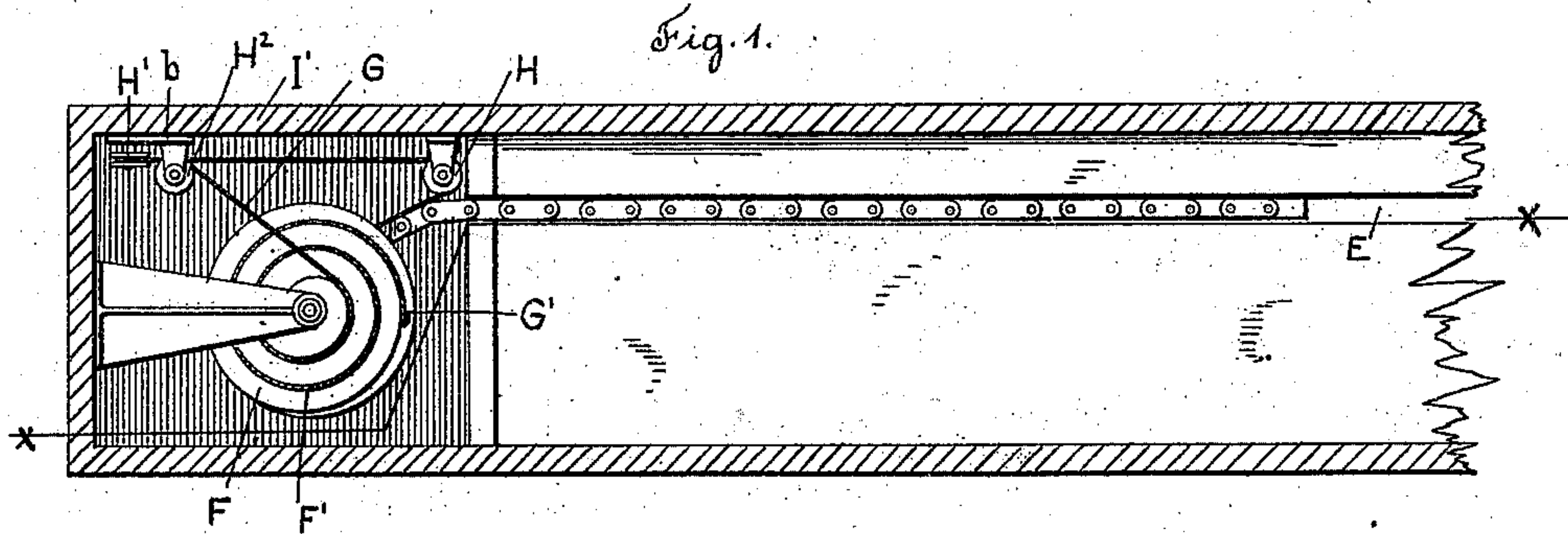


Fig. 4.

Witnesses

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FLEXIBLE DOOR.

SPECIFICATION forming part of Letters Patent No. 550,652, dated December 3, 1895.

Application filed February 27, 1891. Serial No. 383,027. (No model.)

To all whom it may concern:

Be it known that I, ALGENON S. SPAULDING, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Flexible Doors, of which the following is a specification, reference being had to the accompanying drawings, in which—

10 Figure 1 represents a top view of a flexible door embodying my invention. Fig. 2 represents an elevation of a portion of the door, on line X X, Fig. 1, the casing having been removed in order to clearly disclose the operating mechanism; and Fig. 3 represents a top
15 view of the door, a portion of the operating mechanism having been removed, on line Y Y, Fig. 2. Fig. 4 represents a top view of the door wound up, with a portion of the operating mechanism removed, on line Y Y, Fig. 2.

Similar letters refer to similar parts in the several figures.

25 My present invention relates to certain improvements in the connected operating mechanism by which a flexible door is wound upon a shaft or roll within a pocket at the side of the door-opening; and it consists in the construction and arrangement of the several
30 parts, as hereinafter described, and specifically set forth in the annexed claims.

The operating mechanism forming the subject of my invention is designed to be used in connection with those flexible doors which
35 are moved in a horizontal plane in the operation of opening and closing and when closed are coiled or wound into a roll at the side of the door-opening.

40 My invention does not relate to the construction of the body of the flexible door, which may be made in any known method, either by attached parallel bars or strips A upon one or both sides of a sheet of canvas or other flexible material, or it may be made
45 by hinging parallel bars or strips together at their edges, so as to form a flexible curtain.

50 Journaled at the side of the door-opening is a vertical shaft B, to which collars are attached, one of which is shown at C, Figs. 2 and 3. To these collars I attach one edge of the door, which is represented in the draw-

ings as being composed of a series of parallel bars or strips A, connected at their edges in any suitable manner by which a hinged joint is secured, and also preferably connected at
55 their ends by means of a chain D, whose individual links are hinged together and attached to the ends of the bars or strips A.

In the accompanying drawings the door is shown as being opened or extended with its
60 free edge moving in and guided by a slot E in the lintel of the door. Attached to the vertical shaft B, above the upper collar C, is a winding-drum F, provided with a helical groove F' to receive a cord G. The cord G
65 has one end attached at G' to the drum F and its opposite end attached at G² to the collar C.

From the collar C the cord G passes along the side of the door to a small guide-pulley H, from the guide-pulley H to the guide-
70 pulley H', and from the guide-pulley H' to the guide-pulley H² and thence to the drum F. The guide-pulley H is supported by a bracket I, attached to the casing I', and is placed in a horizontal plane a short distance
75 below the upper ends of the bars or strips A and contiguous to the body of the door as it passes from the slot E into the pocket J, causing that portion of the cord G between the collar C and guide-pulley H to be held against
80 the side of the door, as represented at G³, Fig. 3.

Whenever a force is applied to the free edge of the door to push the door into the pocket J, the door is crowded against the section G³
85 of the cord G, which prevents the bending of the door between the guide-pulley H and the collar C, causing the door and cord G to be moved toward the collar C, drawing the opposite end of the cord off from the drum F,
90 and thereby causing the spindle B to be rotated and the door to be wound thereon. As the door is wound around the shaft B, the coil will increase in diameter at each revolution of the spindle B, and the helical groove
95 F' is so proportioned that its diameter will increase at each revolution of the spindle B in the same ratio, causing the cord G to be delivered from the drum F as fast as it is taken up by the door as it is being wound
100 around the spindle B.

When the door is opened, the spindle B is

rotated by the direct pull upon the free edge of the door, and the cord G is rewound upon the drum F as fast as it is released by the unwinding of the door. The pulleys H, H', and H² serve to change the direction of the cord between its attached ends G' G², and the pulley H also serves the purpose of maintaining the section G³ of the cord in proper position to be held against the side of the door between the collar C and the groove E. The spindle B is placed in such position with relation to the groove E that when the winding up of the door is completed, as shown in Fig. 4, the groove E will coincide with and tangent of the coil K. This position of the spindle B with relation to the groove E causes the door to form an angle at L as it enters the pocket J, and a force applied to the free edge of the door when the same is extended or opened, as shown in Fig. 3, would cause the door to bend between the angle L and the collar C were it not pushed against and held by the tension of that portion G³ of the cord G in contact with the door. As the door is wound into the coil K the cord G is wound up with the door, causing the successive coils to be separated from each other by the interposition of the cord between the upper ends of the bars or strips A. This prevents the contact of the coils with each other and the abrasion of the surface of the bars A, and it also, by preventing the contact of the strips or bars A, serves to deaden the noise of the door A in the process of winding.

By the above-described method of connecting the operating-cord G with the flexible door I am able to inclose the entire operating mechanism within the pocket J, and I also leave the free edge of the door entirely disengaged from the operating mechanism, which is of great advantage in many cases where the flexible door or curtain is employed to form partitions which may be varied in their position, requiring that the free edge of the door be capable of being extended and moved about upon the floor in any desired position. When the door is used for that purpose, the groove E is omitted, the coiled door being inclosed within a casing at the side of the room and the door drawn into the room through a vertical slot in the casing, leaving the body of the door free to be moved laterally into any desired partition.

This construction of the flexible door allows it to be used as a curved partition in the corners of rooms by placing the body of the door in a curved position as it is extended. The end G² of the cord G is represented as being attached directly to the collar C; but it will be evident that the cord might be attached to the attached edge *a* of the door. The pulleys H' and H² are supported upon brackets projecting from a common plate *b*, attached to the casing I'.

In place of the cord G a metallic chain or flexible metallic band can be used; but I deem

a cord preferable, for the reason that it serves to cushion the door as it is being wound and prevent the abrasion of the surface of the door and also to deaden the sound.

The cord used may consist of a band of any textile material or of a braided cord similar to a sash-cord.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a flexible door and a vertical shaft around which said door is wound of a helical drum attached to said shaft and a cord having one end attached to said drum and the opposite end attached to that edge of the door which is connected with the winding shaft and guide pulleys by which the direction of said cord is changed, substantially as described.

2. The combination with a rotating shaft and a flexible door having one edge attached to said shaft, a helical drum attached to said shaft, a cord having one end attached to said helical drum and having its opposite end connected with the edge of said door which is attached to said rotating shaft, and guide pulleys over which said cord passes, whereby it is held in position to be unwound from said drum and wound between the coils of said door as it is being wound upon said shaft, substantially as described.

3. The combination with a rotating shaft and a flexible door having one edge attached to said shaft, of a helical drum attached to said shaft, a cord having one end attached to said helical drum, and having its opposite end connected with the edge of the door, which is attached to said shaft and guide pulleys by which said cord is held in position between said drum and said door, one of said guide pulleys being arranged contiguous to said door, whereby a portion of said cord is held against said door as it approaches said shaft in being wound thereon, substantially as described.

4. The combination with a rotating shaft and a flexible door arranged to be wound around said shaft of a cord G, operatively connected with said door and said shaft and having a section G³, held in contact with said door as it approaches said shaft and serving as a guide for said door as it is being wound, substantially as described.

5. The combination with a rotating shaft and a winding drum attached thereto of a flexible door arranged to be wound around said shaft and a cord operatively connected at its opposite ends with said drum and said door having one end so attached to said door as to cause the cord to be wound with the door as the door is being wound, substantially as described.

Dated this 9th day of February, 1891.

ALGENON S. SPAULDING.

Witnesses:

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