

March 6, 1951

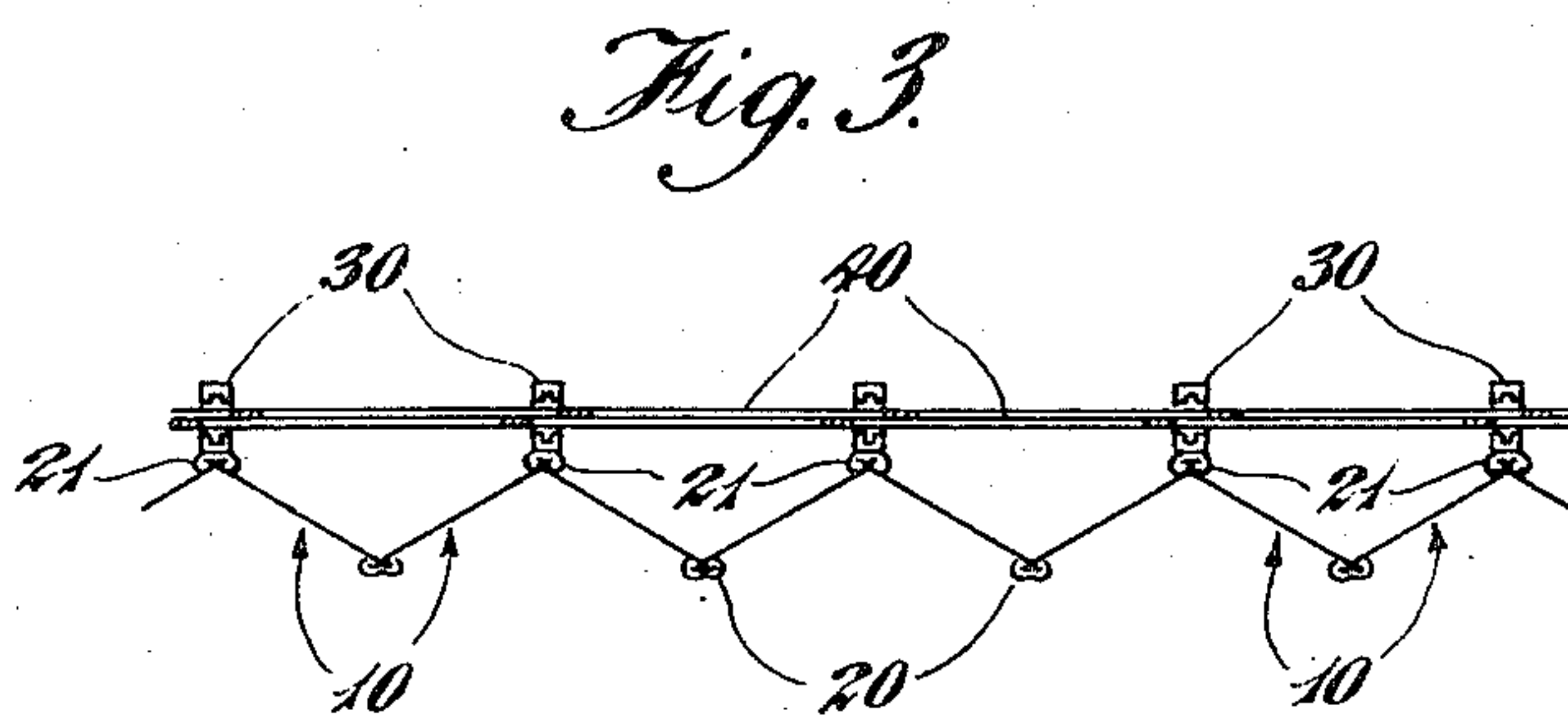
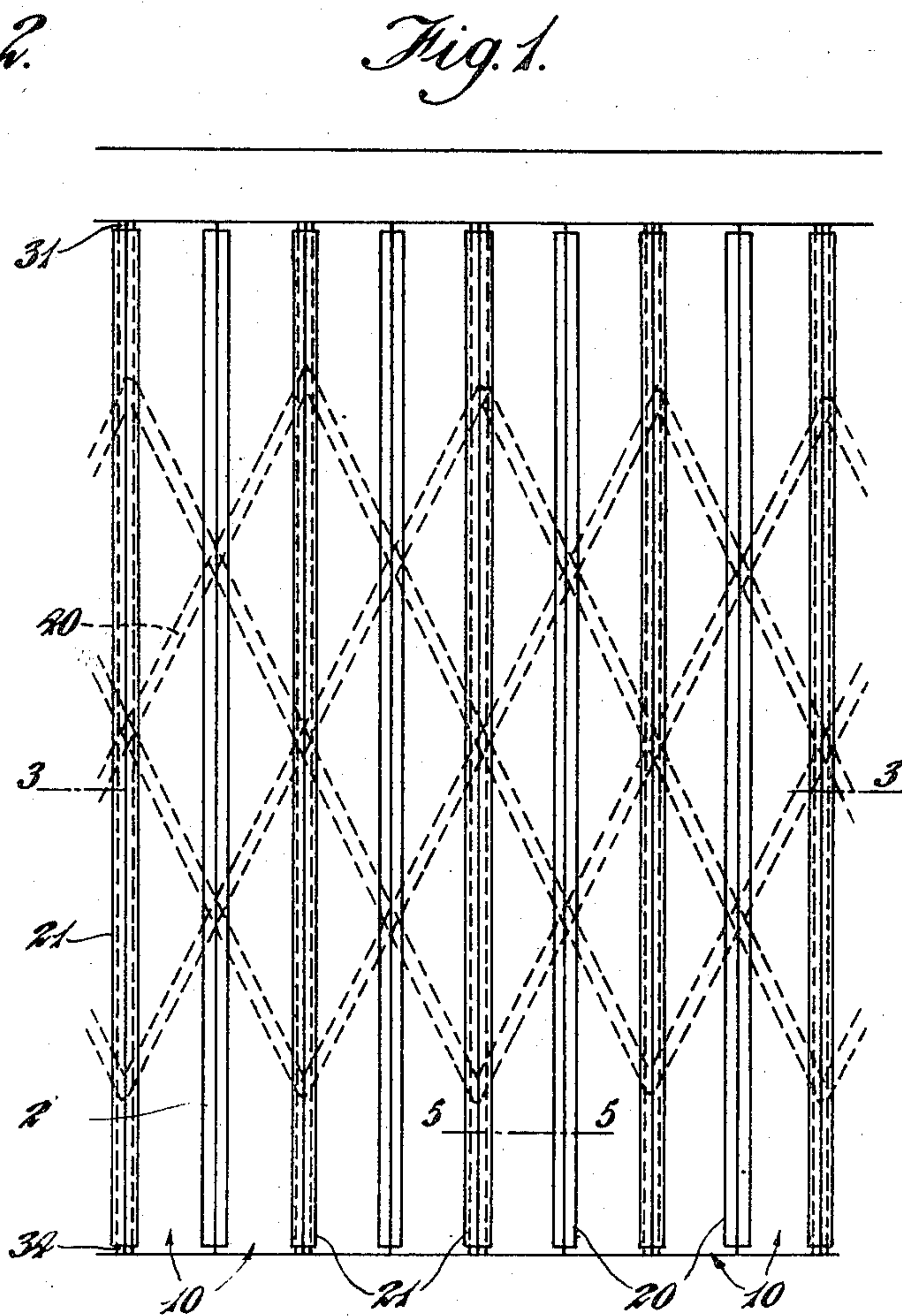
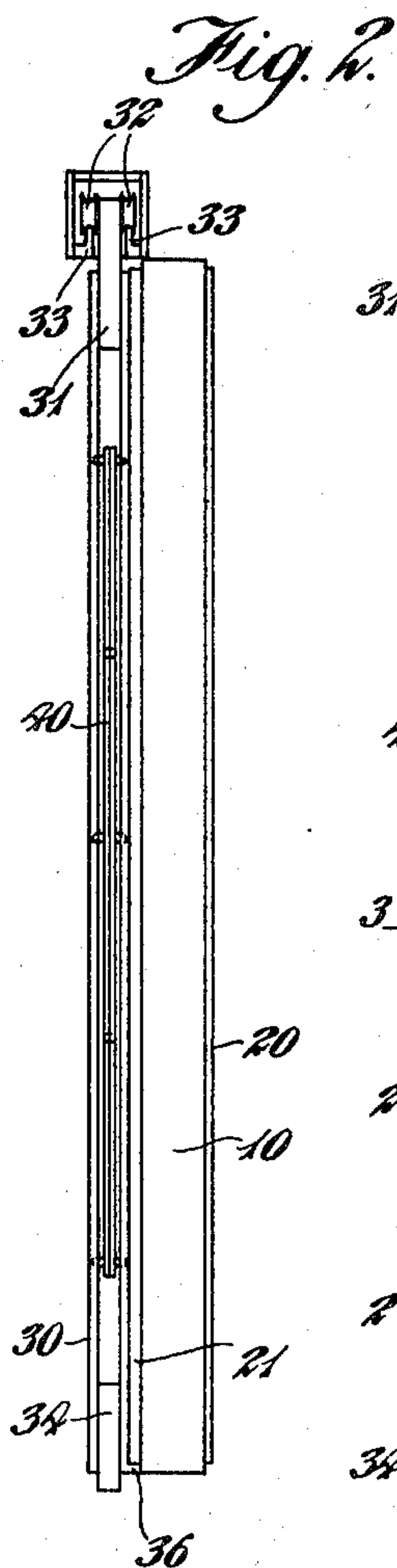
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2,544,008

COLLAPSIBLE GATE, DOOR, AND THE LIKE

Filed April 7, 1947

2 Sheets-Sheet 1



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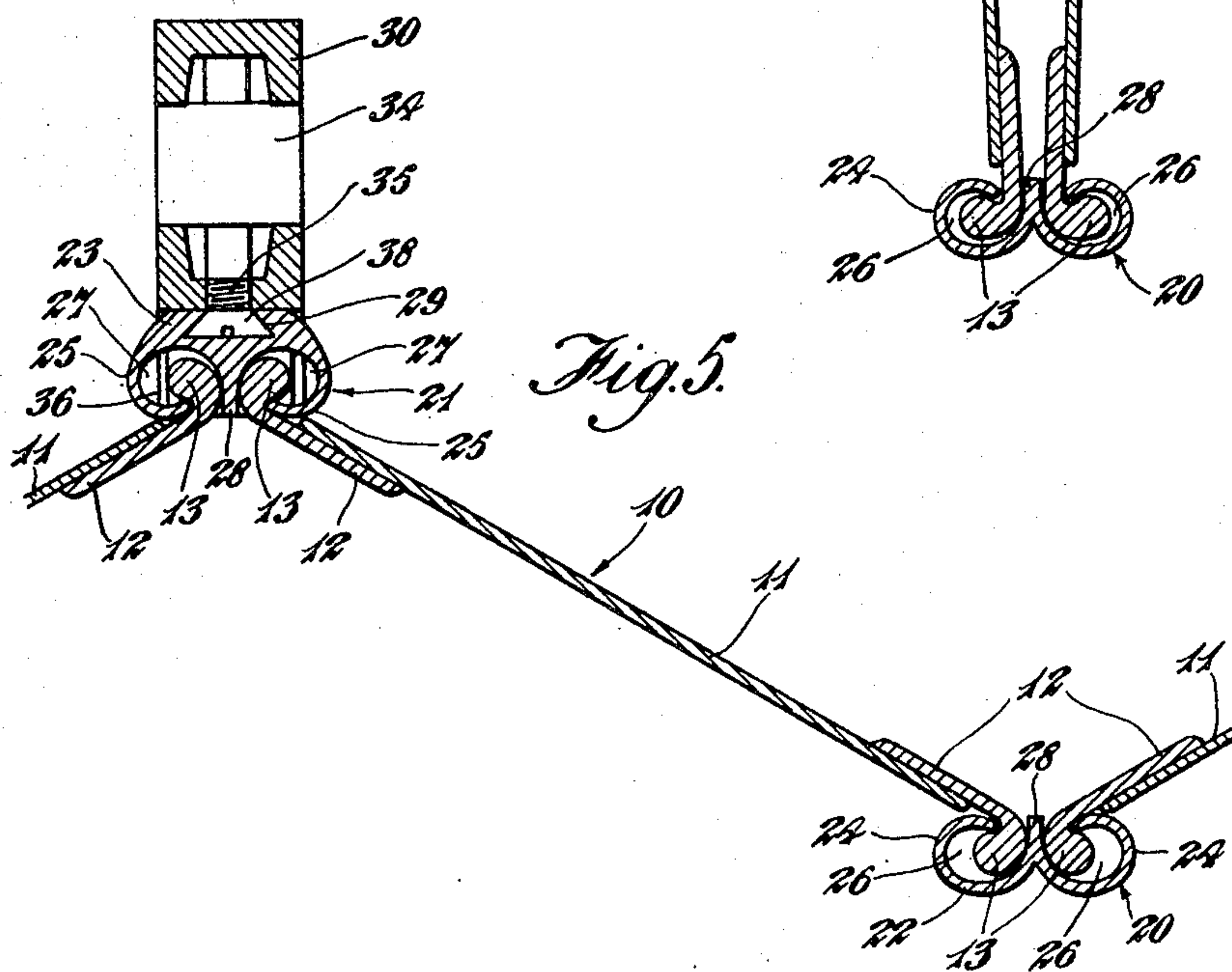
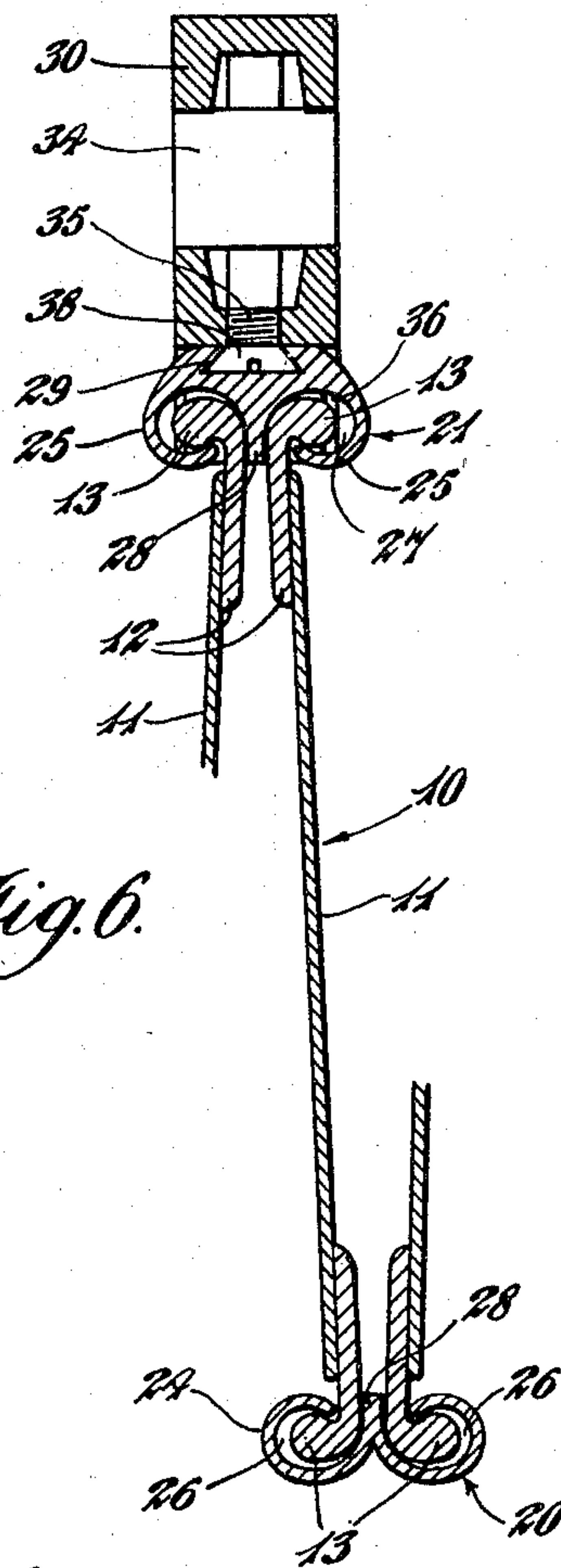
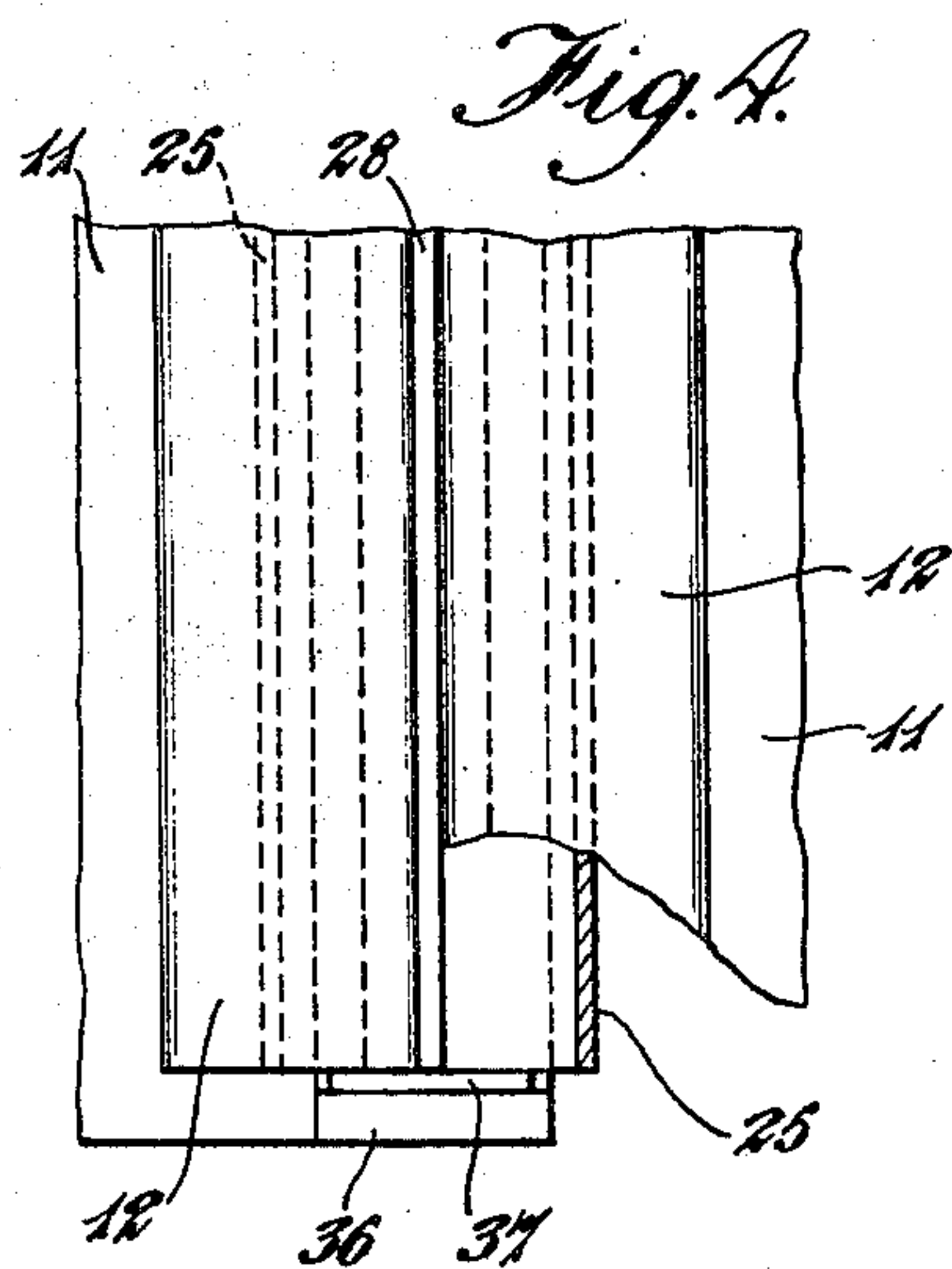
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COLLAPSIBLE GATE, DOOR, AND THE LIKE

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

2,544,008

## COLLAPSIBLE GATE, DOOR, AND THE LIKE

Frederick George Coleman, West Wickham,  
EnglandApplication April 7, 1947, Serial No. 739,778  
In Great Britain April 18, 1946

4 Claims. (Cl. 160—229)

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This invention relates to collapsible gates, doors, shutters and the like (hereinafter referred to as gates in the following description and the claims appended thereto) of the kind comprising shutter plates or panels which are rotatably secured together at their adjacent longitudinal edges so that the shutter plates may be extended to closed position and may be collapsed therefrom to open position by folding the shutter plates together alternately back to back and face to face, accordion-wise, and the invention refers to collapsible gates of the kind above specified wherein the adjacent longitudinal edge portions of the shutter plates, in section, have a rounded contour and are rotatably housed in the channels of longitudinally-extending channelled connecting members, alternate connecting members being secured to pickets or uprights.

The principal object of the present invention is to provide a collapsible gate as set forth above having an improved construction. A more specific object of the invention is to provide such a collapsible gate wherein friction between adjacent shutter plates is obviated. Another object of the invention is to provide a collapsible gate wherein wear at the bottom of the rounded edges of the shutter plates may be readily compensated for. A further object of the invention is the provision of a collapsible gate as set forth above wherein the rounded edges of the shutter plates may be provided in a strong and robust form and may be made of any desired material different from that from which the main part of the shutter plates is constructed. A still further object of my invention is to provide improved connecting means enabling the connecting members to be readily secured to the pickets and detached therefrom.

Further objects and advantages of the present invention will be apparent from the following description of one form of collapsible gate in accordance with my invention read in conjunction with the accompanying drawings, in which

Fig. 1 is a partial front elevational view of the gate in the extended or closed position;

Fig. 2 is a side view of the gate, looking from the left in Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is a front elevational view, partly in section, of part of the lower portion of the gate shown in Fig. 1, drawn to an enlarged scale;

Fig. 5 is a section taken on the line 5—5 of Fig. 1, drawn to an enlarged scale, and

Fig. 6 is a view similar to Fig. 5 but showing the shutter plates folded together.

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The gate shown in the drawing comprises a plurality of shutter plates generally designated 10 which are rotatably secured together at their adjacent longitudinal edges by means of longitudinally-extending channelled connecting members 20, 21, the alternate connecting members 21 being secured to pickets 30. Some or all of the pickets 30 have secured to their upper ends upwardly projecting bars 31 which rotatably carry rollers 32 running on track bars 33, and also have secured to their lower ends downwardly projecting bars 34 which run in a channel (not shown) in the floor. These shutter plates can be collapsed together from the extended or closed position shown in Fig. 1 to open position in known manner by folding the shutter plates together alternately face to face and back to back, as shown in Fig. 6. A lazy-tongs device 40 is preferably secured to the pickets, such device helping to maintain the pickets evenly spaced during opening and closing of the gate.

The shutter plates 10 are each formed of a longitudinally-extending intermediate section 11 (Figs. 5 and 6) and outer longitudinally-extending sections 12 which are riveted or otherwise secured to the intermediate section and which have outer longitudinal edge portions that, in section, have a rounded contour or profile. Such rounded edge portions may be provided by curled edge portions of the sections 12 but are preferably in the form of solid bulbous beads 13, as shown in Figs. 5 and 6. These beads are arranged to project on opposite sides of each shutter plate, as shown in the drawing. It is preferred that the bulbous edge sections 12 be formed separately from the intermediate sections 11 as disclosed, not only for ready replacement when necessary and to permit a selection of materials of construction, but also for the reason that it is easier to roll or extrude the narrower edge sections than to form the entire shutter plates or panels in one piece.

The connecting members 20, 21 comprise a base 22, 23 respectively having convexly curved side portions 24, 25 respectively which are partially returned, and provide two round channels 26, 27 respectively on each connecting member. Adjacent beads on the shutter plates are rotatably housed within the channels of each connecting member, the channels 26, 27 in effect forming loose bearings for the beaded edges or shaft portions of the shutter plates. In accordance with an important feature of my invention I provide the connecting members 20, 21 with a wall 28 which extends centrally of and normally to the base 22 or 23. This wall separates the two chan-



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nels and not only allows the adjacent end sections 12 of the shutter plates to move freely without coming into frictional contact but also functions to confine movement of the shutter plates within predetermined limits, as will be clearly seen from Figs. 5 and 6. The free ends of the curved sides 24, 25 of the connecting members 20, 21 are spaced from the wall 28 a distance less than the maximum cross-sectional dimension of the beaded edges 13 of the shutter plates 10 so that such edges are secured in the channels 26, 27 against lateral withdrawal therefrom.

Whereas the external contour of the connecting members 20 may be omega-shaped as shown or of any other desired ornamental form, the connecting members 21 preferably have a base 23 providing a plane surface for anti-rocking engagement with the front plane face of the pickets 30, and in accordance with a further feature of my invention the base 23 of each connecting member 21 is provided with a longitudinally-extending recess or keyway and the front face of each picket 30 is provided with projections or keys adapted to slide in the said recess or keyway and to secure the picket to the connecting member against lateral separation. Thus, as shown in the drawing the base of each connecting member may have a channel 29 with undercut sides and the pickets 30 may have a plurality of screws or bolts 35 screwed into the front face of the pickets with their heads 38 projecting from the face of the pickets and dovetailed to correspond in shape to the channels 29 in the connecting members 21. In this manner, not only can the beaded edges of the shutter plates be slid lengthwise into the channels in the connecting members but the pickets can also be slid lengthwise into engagement with the connecting members, both the shutter plates and the pickets being readily detached from the connecting members when desired.

In accordance with a still further feature of my invention I support the shutter plates on bearing blocks fitted at the lower end of the connecting members 21, and also, if desired, at the lower end of the connecting members 20. In the preferred arrangement illustrated in the drawing, the lower end of each picket has a wall 36 which extends normally to the picket in spaced relationship to the lower end of the connecting member 21 secured to the picket so as to form a recess in which a bearing block 37 is housed. In an alternative arrangement, not shown, the bearing blocks are supported by the connecting members. The bearing blocks 37, which are made of hardened steel or other suitable material, readily allow adjustments to be made to compensate for wear at the ends of the shaped sections 12 of the shutter plates, it being merely necessary, for example, to insert shims of steel or the like beneath the shaped sections, which can be readily raised to allow the shims to be inserted.

The collapsible gate just described has numerous advantages of which the following may be noted. The rounded longitudinal edges of the shutter plates are strong and robust and may be made of any desired material which may be different from that of which the intermediate sections of the shutter plates is made. Such intermediate sections, moreover, may be made of sheet material of any desired gauge. The connecting members, whilst allowing the shutter plates freely to rotate relatively thereto, prevent the shutter plates from coming into frictional contact and

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act as stops to confine the movement of the shutter plates within definite limits. The weight of the shutter plates is taken by bearing blocks which allow wear at the ends of the rear shaped sections readily to be compensated for as by the insertion of shims or new bearing blocks. Since not only the shutter plates but also the pickets are slidably secured to the connecting members, the various parts of the gate are readily assembled together and may readily be given a relative longitudinal movement for the purposes of adjustment.

I claim:

1. A collapsible gate of the kind specified, comprising shutter plates whose longitudinal edge portions have, in section, a rounded enlarged bulbous contour, longitudinally-extending connecting members each providing channels in which adjacent longitudinal edge portions of the plates are rotatably secured, whereby the shutter plates are rotatably secured together at their adjacent longitudinal edges, pickets to which alternate connecting members are attached, and a wall on each connecting member extending completely between the adjacent bulbous edge portions of adjoining shutter plates separating the channels therein and being the sole means for maintaining out of contact the bulbous edge portions of the plates secured in the channels, said channels and the separating wall therefor cooperating to embrace and prevent lateral withdrawal from said channels of the edge portions of said plates.

2. A collapsible gate as claimed in claim 1, wherein each connecting member comprises a base, a wall upstanding centrally therefrom and upstanding sides having inwardly extending portions, the said base, wall and sides forming two channels of substantially circular cross-section, within which said bulbous edge portions are loosely rotatably retained.

3. A collapsible gate as claimed in claim 2, wherein the rounded longitudinal edge portions of the shutter plates are in the form of solid bulbous beads and are provided by separate end plate sections secured to an intermediate plate section, whereby a selection of materials for forming said shutter plate portions may be had and the production of the shaped edge portions facilitated.

4. A collapsible gate as claimed in claim 3, wherein the base of each connecting member secured to a picket has a longitudinally-extending undercut recess and each picket has at least one projection corresponding in transverse section to and housed in the recess of its connecting member whereby the connecting members are slidably secured to the pickets.

FREDERICK GEORGE COLEMAN.

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