

No. 679,583.

Patented July 30, 1901.

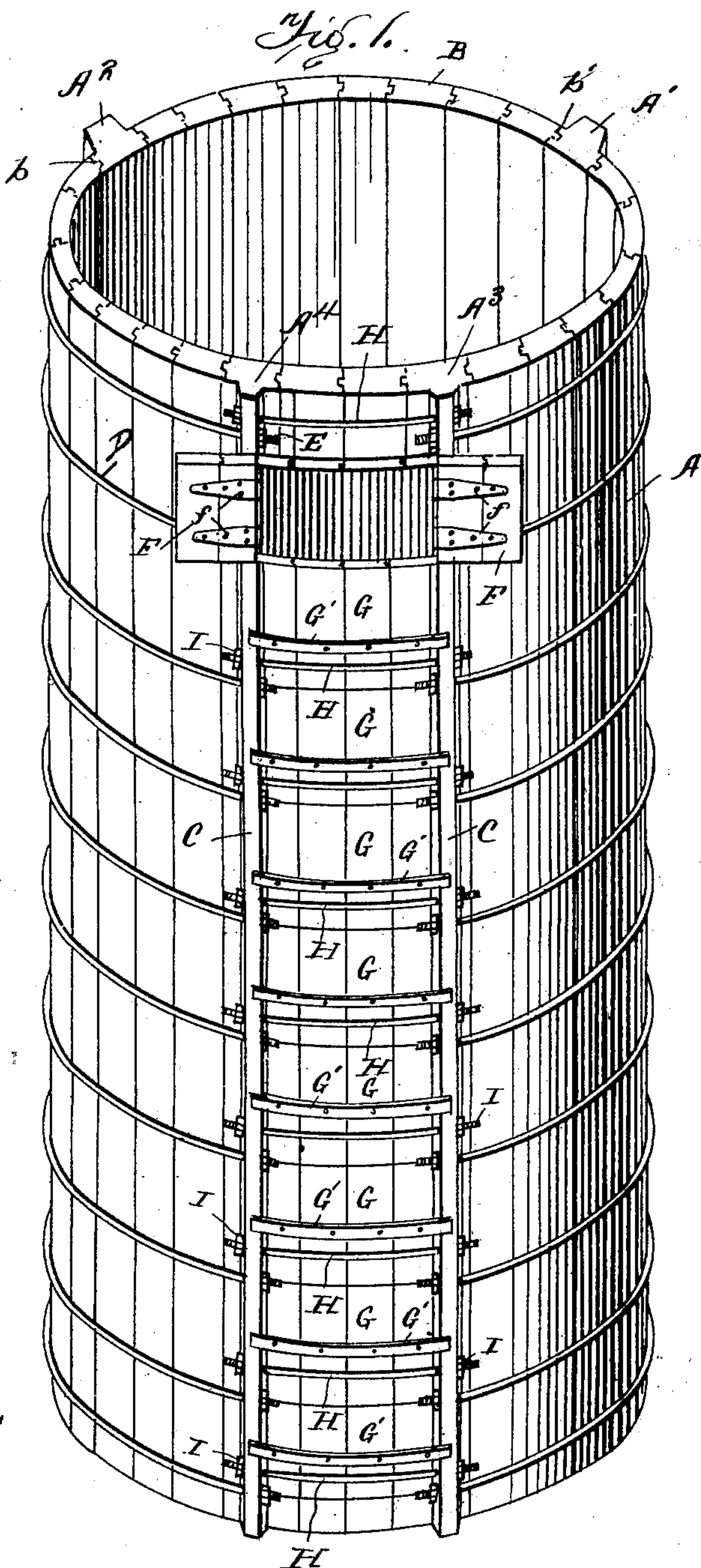
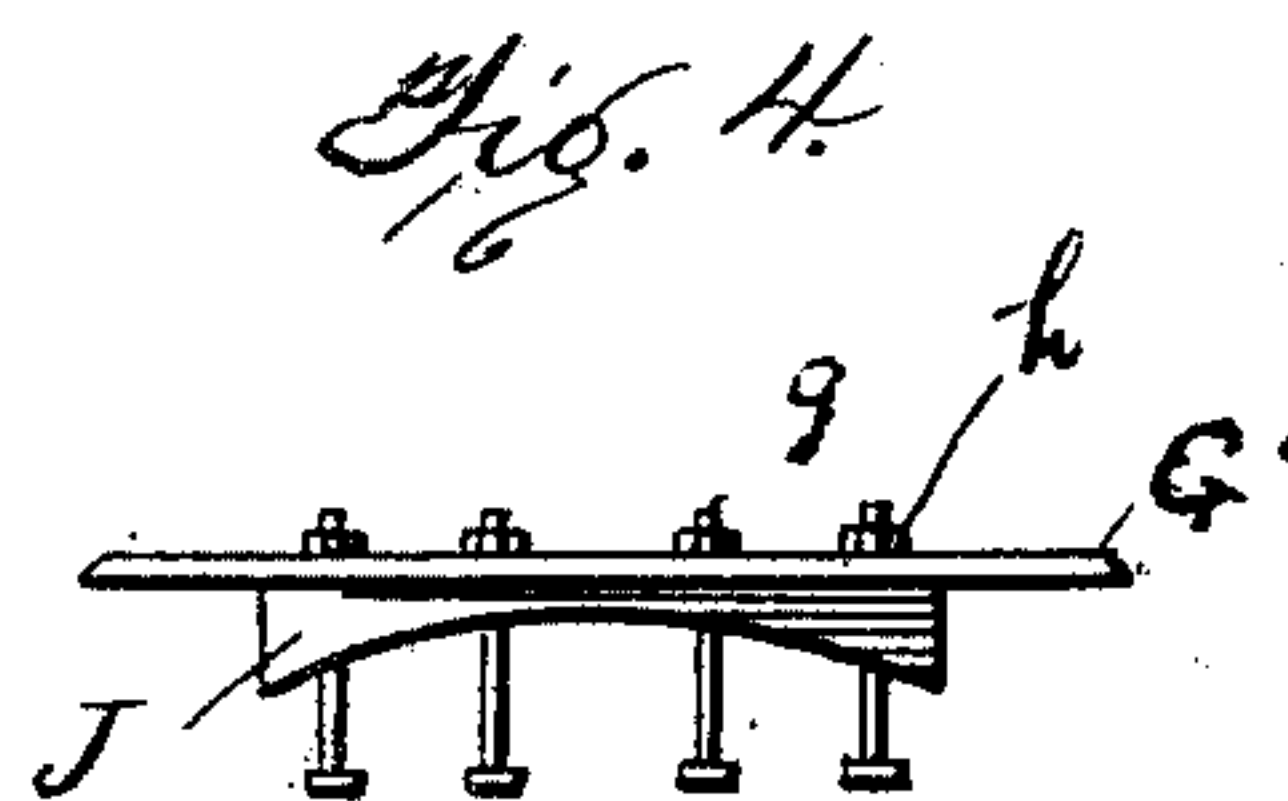
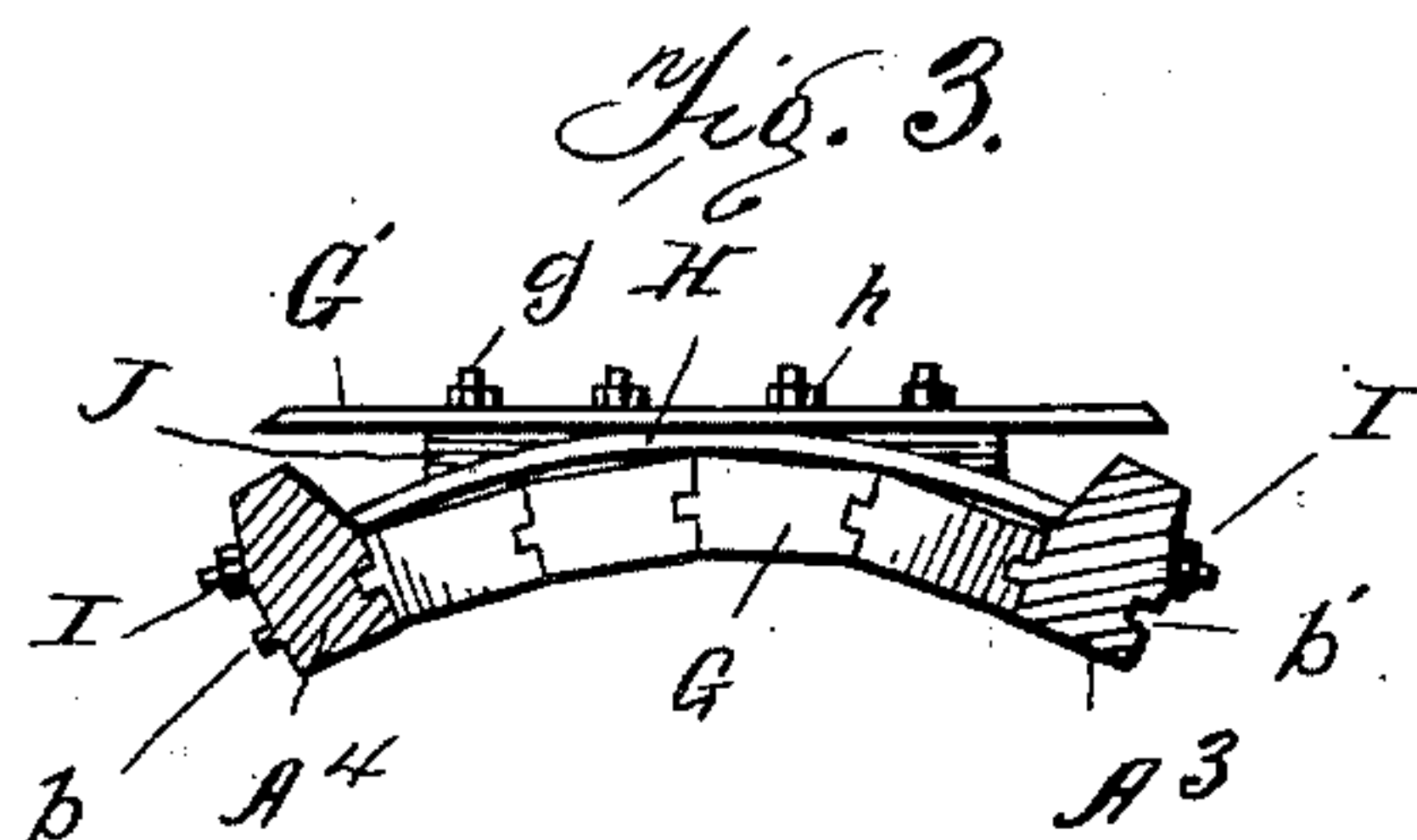
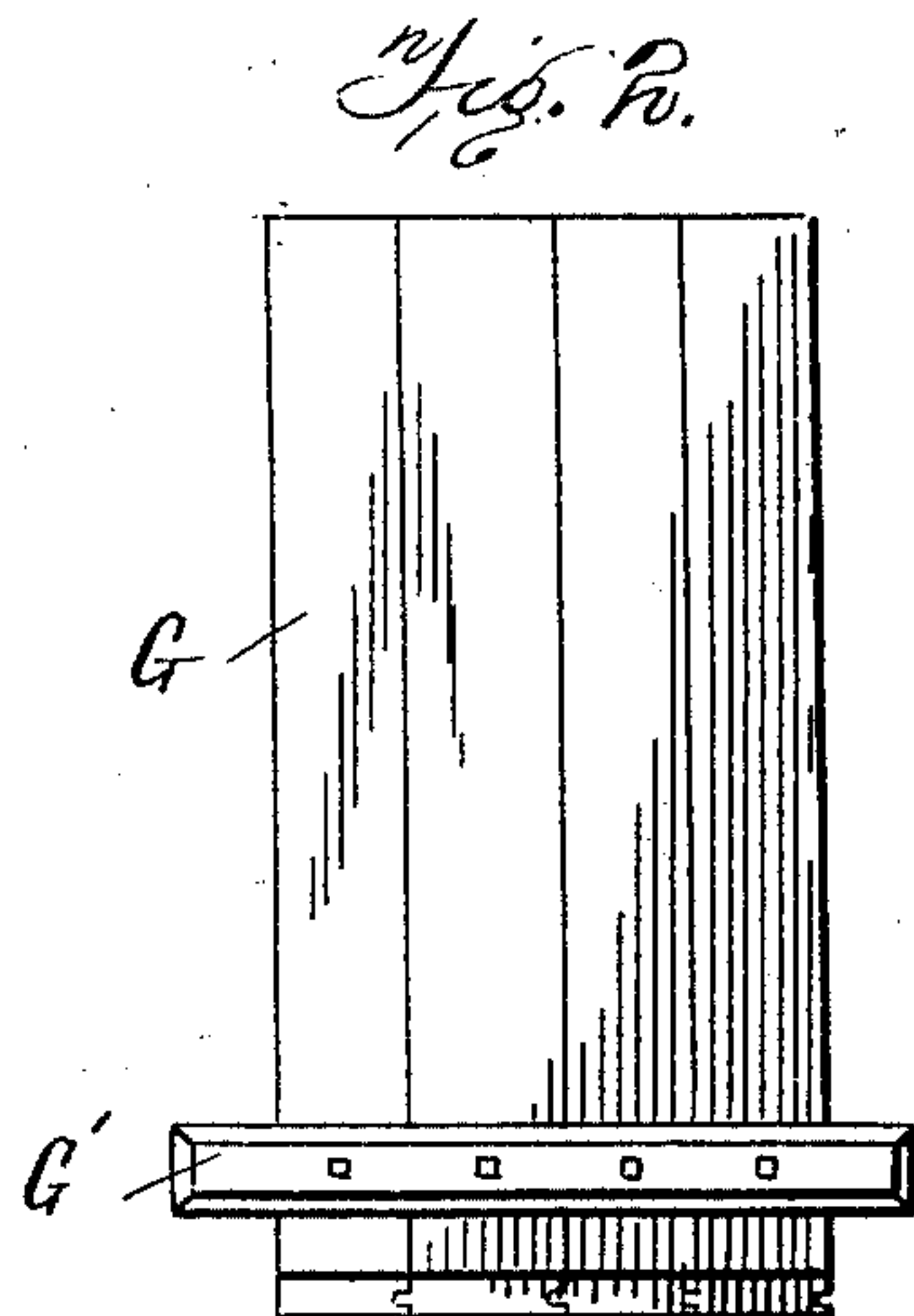
J. W. WOODRUFF.

SILLO.

(Application filed July 16, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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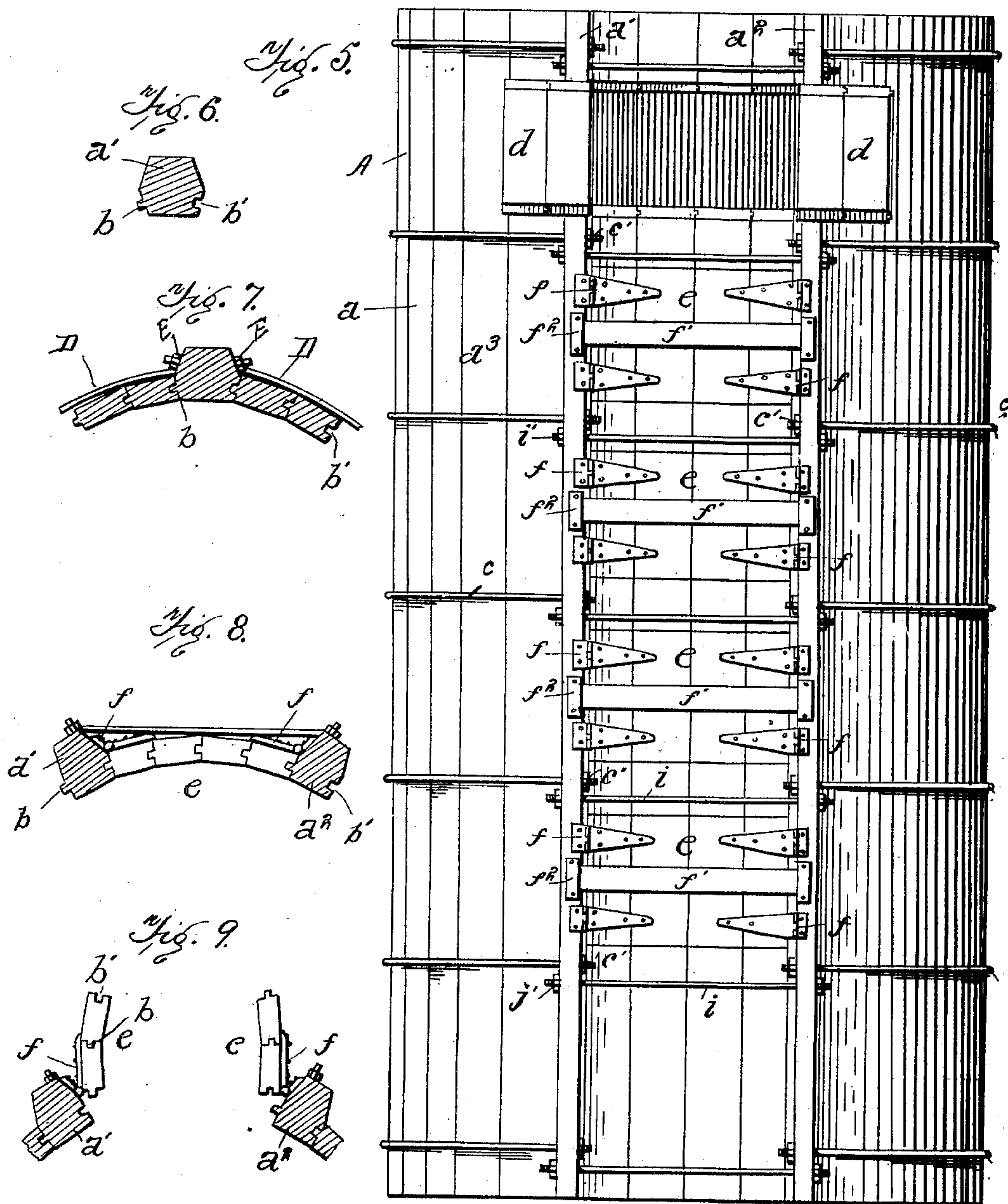
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3 Sheets—Sheet 2.



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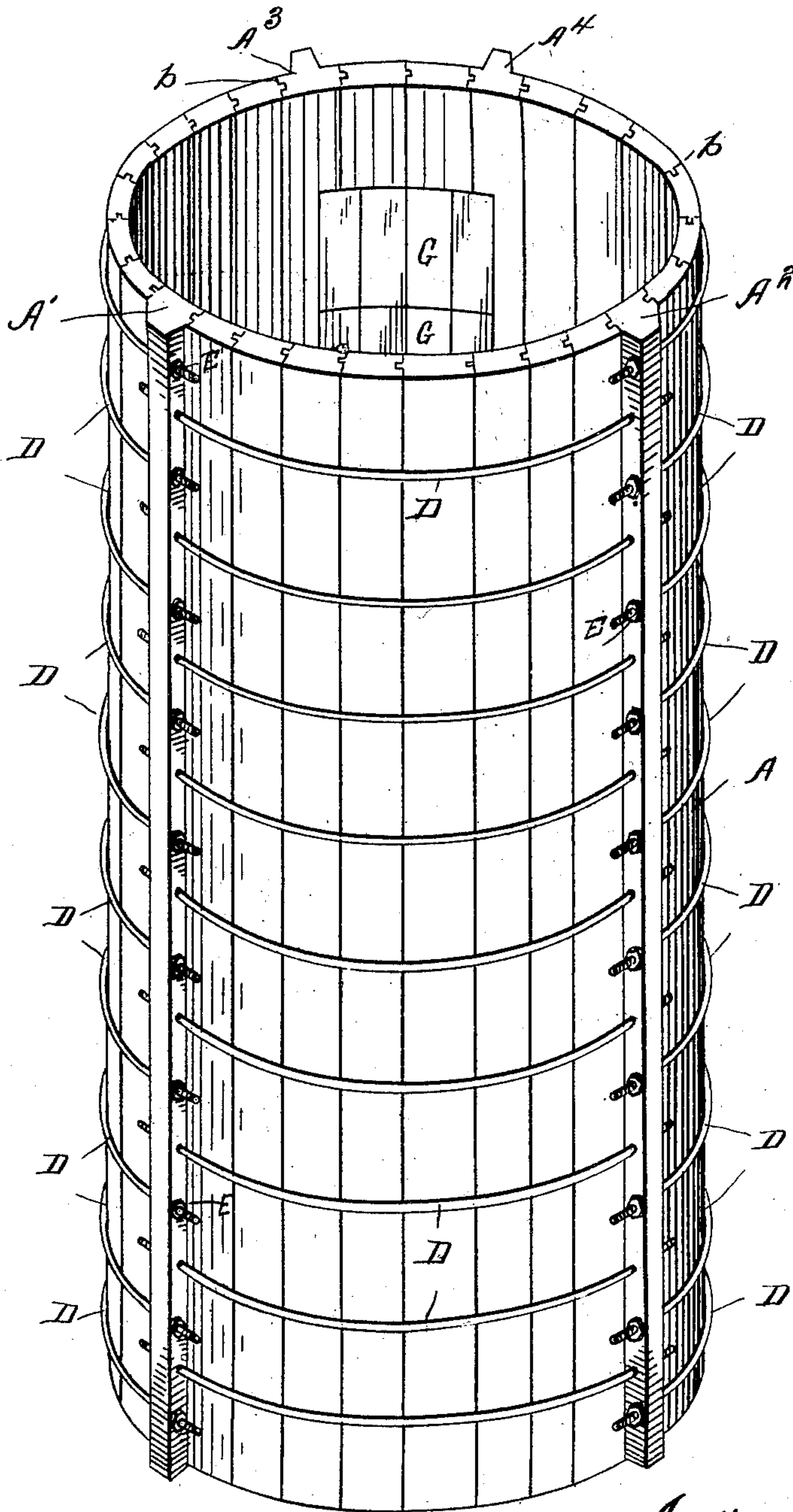
SIL0.

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(No Model.)

3 Sheets—Sheet 3.

Fig. 10.



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UNITED STATES PATENT OFFICE.

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SILLO.

SPECIFICATION forming part of Letters Patent No. 679,583, dated July 30, 1901.

Application filed July 16, 1900. Serial No. 23,742. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. WOODRUFF, a citizen of the United States, residing at Hamburg, in the county of Erie and State of New York, have invented certain new and useful Improvements in Silos or Tanks for Holding and Preserving Food for Cattle, such as Fodder and the Like, of which the following is a specification.

10 The object of the invention is to furnish a silo that will be simple and economical in construction and easily operated.

To this end the invention consists in the novel construction and combination of the
15 several parts composing the silo, as will be hereinafter more in detail described, and particularly pointed out in the claim.

In the accompanying drawings, to which reference is had and which fully illustrate
20 my invention, Figure 1 is a front elevation of my device, and Figs. 2, 3, and 4 are detail views of the same. Fig. 5 is a front view of the modified form of the silo. Figs. 6, 7, 8, and 9 are details thereof, and Fig. 10 is a rear
25 view of the silo as shown in Fig. 1.

Referring to the drawings by letter, A designates the silo, which is of cylindrical form and composed of a series of staves and coupling-standards A' A², which form a part of
30 and are used therewith, all of said parts being united together by means of tongues and grooves b b'. A narrow opening is formed in the silo, extending its full length or from top to bottom, and along the sides of this opening are provided ways C C, within which slide
35 a series of doors arranged one above the other, a hinged door being also provided therein above the sliding doors, as will be hereinafter explained.

40 D designates metallic bent rods or sections of hoops arranged in series around the device from top to bottom, which are passed from one coupling-standard to another, securing each section of the several sections
45 separately, their free ends being provided with nuts E E, by which the sections of rods or hoops around the silos are tightened up or loosened at will, as occasion requires.

50 F designates a double door located in front of and near the top of the silo and secured or hinged, as at f f, to the coupling-stand-

ards A³ A⁴ and opening outwardly, leaving the tongue and groove clear in the coupling-standards.

G designates a series of sliding doors 55 snugly fitted in and sliding in the ways C C, each door of the series being down or closed, as shown in Fig. 1 of the drawings. These sliding doors G are provided with beveled cleats G', which bear upon the outside of the
60 ways C C and are secured to the sliding doors by means of bolts g and nuts h, as clearly shown in Fig. 3, and by which the doors are slidably secured in the ways.

H designates rods of curvilinear form lo- 65 cated just below and in juxtaposition to the lower ends of the sliding doors, these rods being passed through the coupling-standards A³ A⁴ or ways C C and having nuts I I on their ends for tightening or loosening the
70 silo as required, and which are shown in Fig. 3 of the drawings.

J designates a concave block, which is fitted to the sliding doors and which acts as a bearing-surface for the cleats G'. 75

In Fig. 5 I have shown a modification of the above construction wherein a designates the silo, composed of the coupling-standards a' a² and staves a³, having tongues b and grooves b' and the binding-hoops c, the free
80 ends of these hoops being passed through the coupling-standards and provided with nuts c' for drawing together or loosening the device as the device shrinks or swells from the material in fall or hot weather, a plan view of
85 the coupling-standards being shown in Fig. 6.

d designates the upper tongue-and-grooved beveled hinged curvilinear door, hinged, as at d', and swung open, as shown in Fig. 9 of the drawings. 90

e designates a series of double tongue-and-grooved beveled hinged doors, hinged to the coupling-standards by means of strap-hinges f and provided with beveled bars f', which take into keepers f² for keeping them closed. 95

i designates rods passed through the coupling-standards and having nuts j' upon their outer ends.

The openings in the silos are made changeable from the top to the bottom, and the sliding
100 doors are never entirely removed; but as the contents of the silo are taken out these doors

are raised by means of loosening the nuts on the rods which pass through and hold the stave and coupling-standards or ways C C.

By the construction of my silo the carbonic-acid gas is retained, which is necessary for the proper preservation of the silage, the silo being strongly hooped from top to bottom and so arranged that when it is filled with green corn or other material the nuts can be loosened and when empty in dry weather they can be tightened.

The carbonic-acid gas which is created by the fermentation of the contents of the silo when being converted into silage is retained. This being heavier than the air, the contents must be removed from the top. To accomplish this purpose, the changeable openings are provided to commence from the top, as hereinbefore mentioned.

Between the first and second hoop from the top of the silos is provided beveled double-hinged doors, just referred to above. As they open outwardly it leaves the tongue and groove in the coupling standards or lugs free and clear, so that when the contents have been used down to the bottom of this door the opening is changed to below the next hoop by raising the top section of these tongue-and-grooved beveled sliding doors, first loosening the nuts on the rods adjacent to the doors and then tightening them. As the contents are used the openings are changed by sliding up one after another of the grooved and beveled sliding doors until the silo is entirely emptied, then loosening the nuts on the rods of this section, which allows all the doors to slide down, and closing the hinged doors at the top the silo is ready for filling another year.

In building the silo the stave or coupling-standards are set up at convenient distances apart, so as to divide the circumference of the tank or silo into three or four parts, and sectional rods are passed through each standard and form practically a continuous hoop entirely around the silo, thus admitting of drawing of the tank or silo snugger than though a single hoop went the whole of the way around, and inasmuch as the staves or coupling-standards are set up and become a part of the silo or tank it makes it much stiffer and stronger than though they were secured against the outside. They therefore answer the several purposes of staves, and to keep the hoops in their proper places, both

horizontally and perpendicularly, and also as a post or door-frame in the door-section, they can be made of any desirable material to correspond with the size used in the body of the silo or tank.

It will be readily seen that the advantages derived from my construction of the silo are that the staves or coupling-standards are tongued and grooved and form a part of the silo itself, and by being made in this manner hold it more securely against the wind or pressure of the contents and keep the hoops from sliding down in summer-time. When the silo is empty and the staves shrink, all that it is necessary to do to make the silo tight is to take a wrench and tighten up the nuts on each side of the standards. These standards have the same bevel on the edge which fit against the staves as the staves themselves, which form a perfect circle and make a good tight joint on both sides. The part of standards which projects out beyond the circle of the silo is also beveled in order that the rod may take the nut when it extends through without bending.

The silo or tank thus made is practically air-tight, so as to preserve the silage in good condition, and with this changeable opening is conveniently operated, and with these staves and coupling standards or lugs is made substantial, and the hoops can be adjusted to all conditions of the silo or its contents.

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

In a silo the combination with the ordinary staves thereof, a series of combined beveled staves or coupling-standards located at each side of the opening or doorway and at various points around the silo, said standards being projected beyond the outer surface of the silo, a series of doors for closing said opening or doorway and a series of sectional metallic bracing-hoops passing from standard to standard provided with screw-threaded ends and nuts upon said ends whereby the silo can be tightened or loosened as desired at any point of its circumference, substantially as described and for the purpose set forth.

JOHN W. WOODRUFF.

Witnesses:

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