

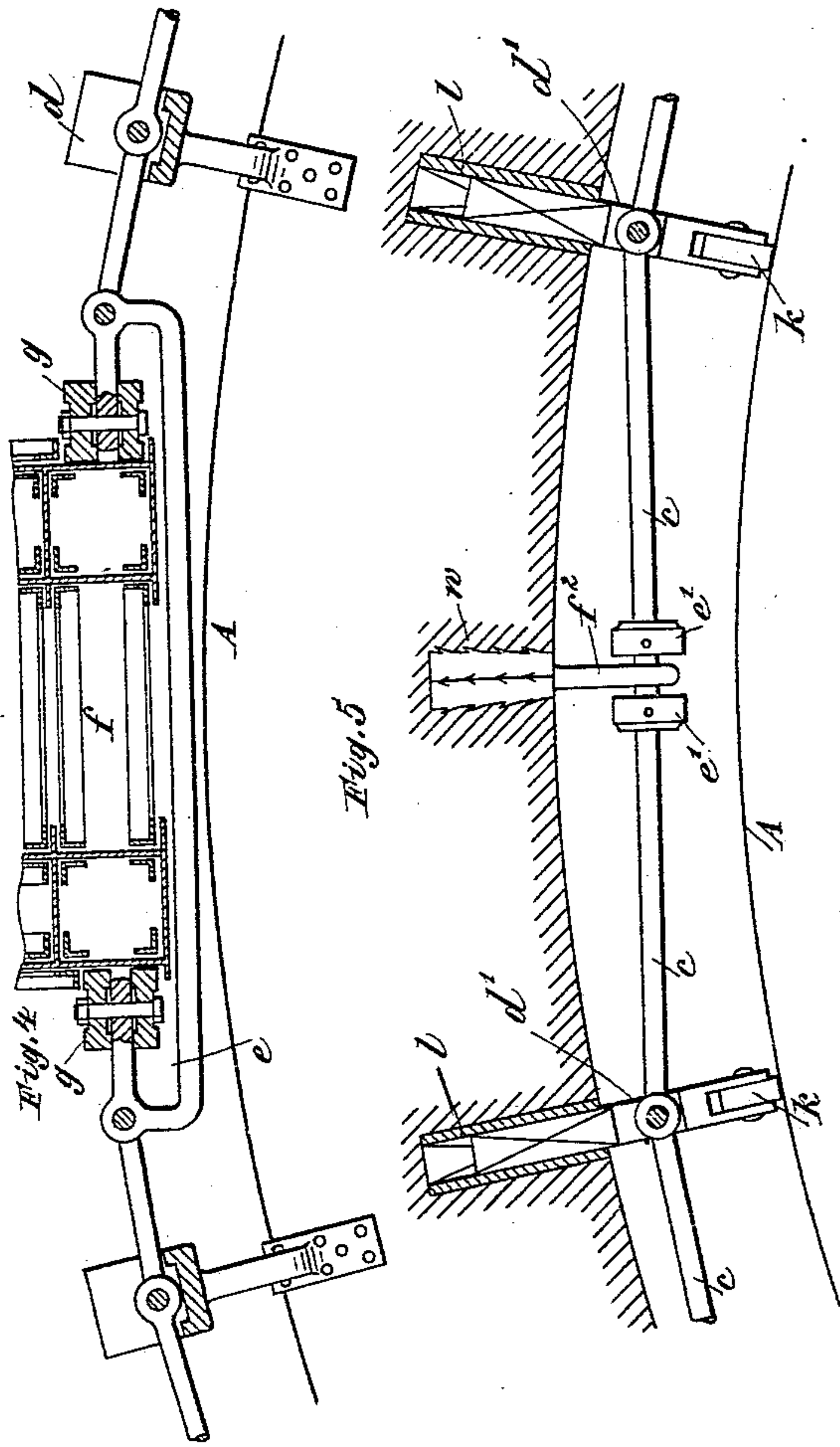
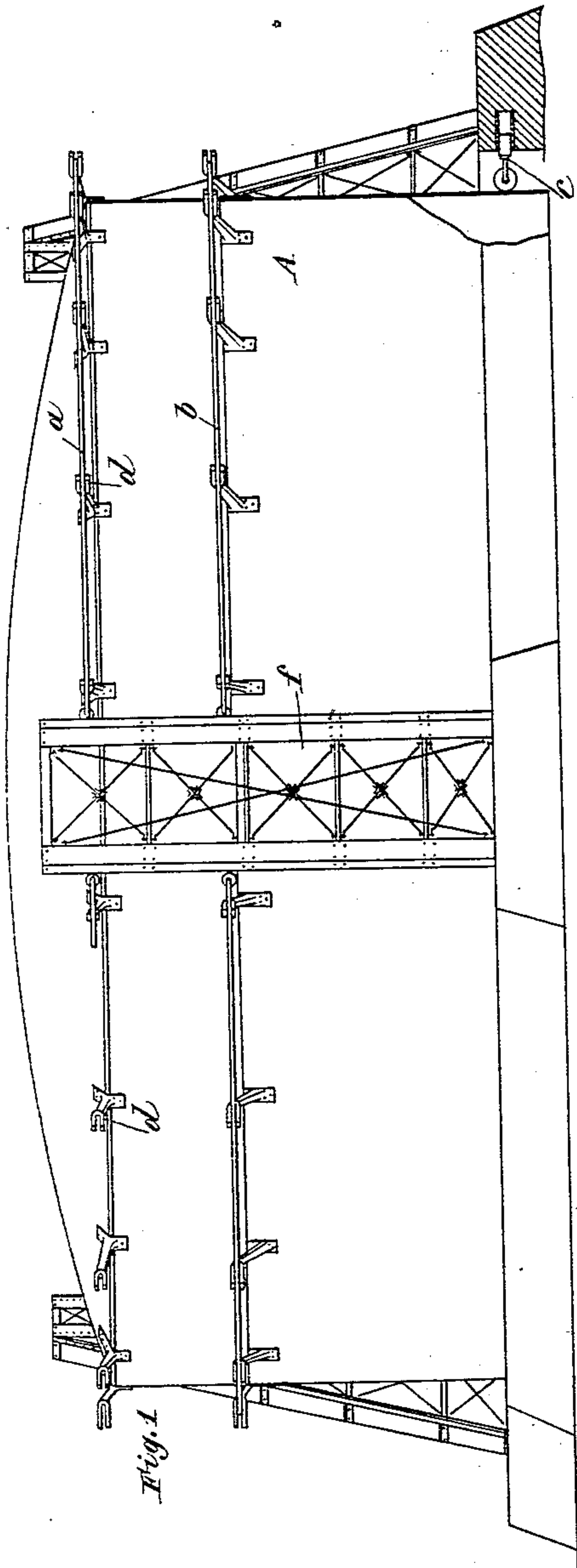
(No Model.)

2 Sheets—Sheet 1.

H. HACKER.  
GUIDE FOR GAS HOLDERS.

No. 555,215.

Patented Feb. 25, 1896.



**Witnesses:**

J. D. Kungsberg.  
G. A. Kauberschmidt

**Inventor:**

By Heinrich Hacker  
Whitaker & Trest Atty.

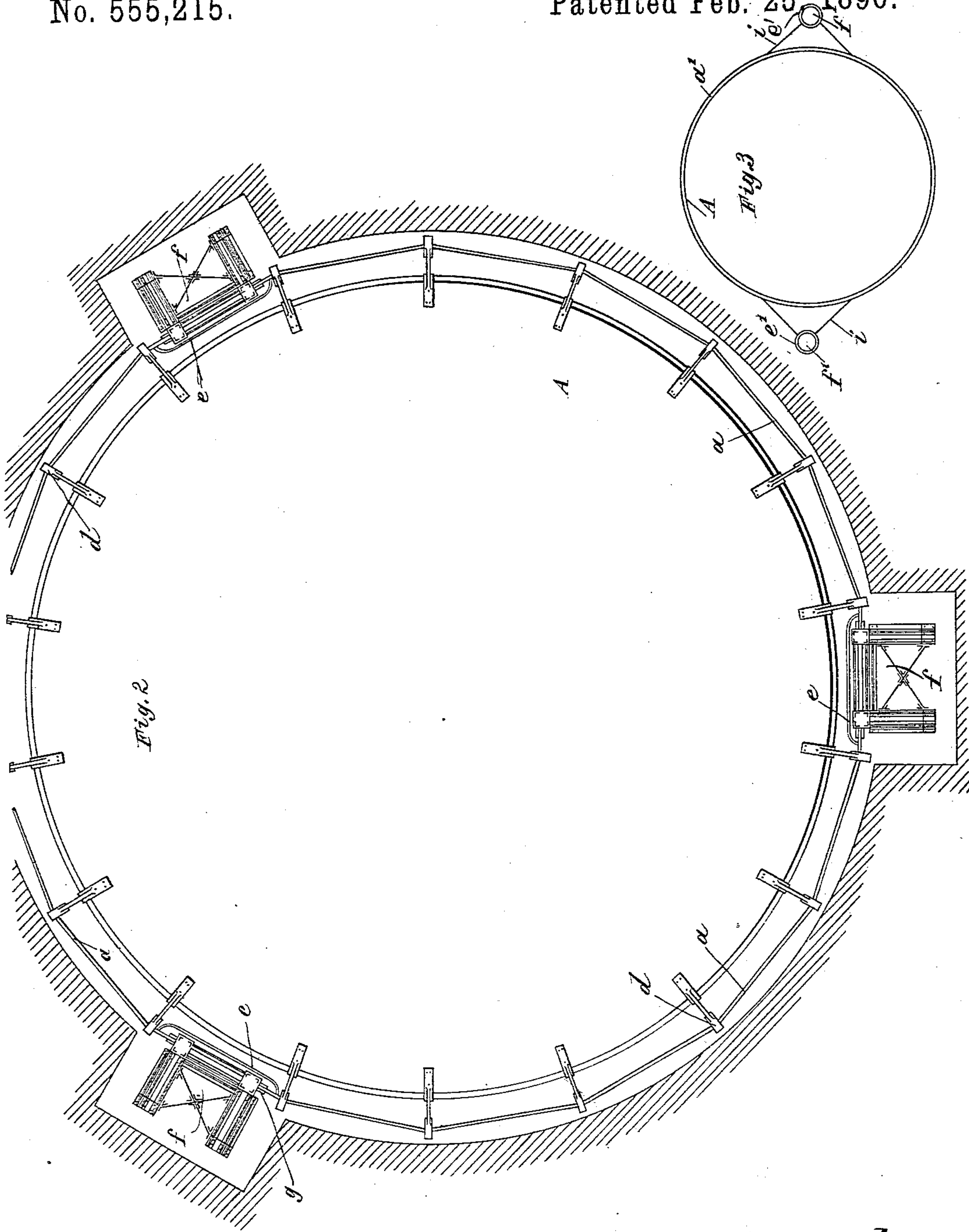
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2 Sheets—Sheet 2.

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GUIDE FOR GAS HOLDERS.

No. 555,215.

Patented Feb. 25, 1896.



*Witnesses:*

*J. D. Kingsbury*  
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*Inventor:*

*By Heinrich Hacker*  
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# UNITED STATES PATENT OFFICE.

HEINRICH HACKER, OF BERLIN, GERMANY.

## GUIDE FOR GAS-HOLDERS.

SPECIFICATION forming part of Letters Patent No. 555,215, dated February 25, 1896.

Application filed July 10, 1895. Serial No. 555,533. (No model.)

*To all whom it may concern:*

Be it known that I, HEINRICH HACKER, a subject of the Emperor of Germany, residing at Berlin, German Empire, have invented certain new and useful Improvements in Guides for Gas-Holders; and I do hereby declare that the following is a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Guiding devices for gas-holders above the point where they are surrounded by masonry are, as a rule, in the form of guiding-scaffolds which inclose the holder. As the former are expensive they have in some instances been replaced by ropes which surround the holder in vertical and horizontal directions and run over suitable pulleys. Besides these there are other forms in which ropes are applied in the interior of the holder connected with a ring, which slides up and down on an inner guiding tube or pillar. These forms of guides are deficient, first, in making access to the interior for inspection or repairs more or less difficult, and, second, in being exposed to great strains at constantly-changing points and from constantly-changing directions, so that the entire strain is received upon but a small part of the guiding devices, and on this account each part must be of sufficient strength to sustain the entire strain instead of simply its proportionate part of the strain, thus rendering these devices expensive and very difficult of construction. The ordinary guiding-scaffolds rising above the water-cistern, which consist of a large number of pillars connected by rings and braces, also suffer from the above inconvenience, for a constant and accurate bearing of the guide-pulleys with the holder is impossible in consequence of inequalities in expansion of parts caused by the variations of temperature. To these are added the unavoidable inaccuracies of construction, especially in holders of large dimensions, the changes of form of the holders in consequence of the gas-pressure within, and the tendency of the holder to take an inclined position owing to wind-pressure or weight of snow upon the outside.

Experience shows that when the guide-pulleys at the beginning have been accurately

adjusted, they later on must be loosened in order to avoid the suspension of the holder or too strong frictional resistance to its vertical movements. In consequence but two or three of the guide-pulleys transmit all the pressure upon the scaffolding. This is particularly dangerous when the bell-cover is at its highest position and the wind throws it from one side to the other. The cover then exercises a strong horizontal thrust, which must be sustained by single portions of the scaffolding, and all the parts of the scaffolding must be constructed of equal strength, since the wind-pressure may come from any direction.

The foregoing inconveniences are overcome by my invention, which is illustrated in the accompanying drawings and fully disclosed in the following description and claims.

In the drawings, Figure 1 represents an elevation of a gas-holder constructed according to my invention and provided with only three supporting-pillars. Fig. 2 is a top plan view of the same. Fig. 3 is a top plan view of a modification of my invention. Fig. 4 is an enlarged view of a portion of the holder shown in Figs. 1 and 2. Fig. 5 is a similar view of another portion of the same.

In the drawings, A represents the bell portion of the holder, the lower edges of which are immersed in a cistern surrounded by masonry walls B, both the bell and cistern being preferably circular in cross-section.

*a*, *b*, and *c* represent a series of surrounding rings formed of ropes, chains, jointed rods or other desired constructions, the two upper rings having a sliding engagement with the pillars *f*—in this instance three in number. One of these rings, as *c*, is supported from the masonry of the cistern and one or more of said rings is supported by the bell-holder A, as in this instance the rings *a b*. I prefer to form the upper rings, *a b*, of jointed rods, as shown best in Figs. 2 and 4, the said rods being supported at their joints by suitable brackets *d*, which are rigidly secured to the bell-holder A. These rings are provided adjacent to each of the pillars *f* with offset portions *e*, each of which embraces one of said pillars and has a vertically-sliding engagement therewith. In order to reduce the friction as much as possible the said offset por-



tions are provided with opposing friction-rolls *g*, which engage lateral vertically-disposed faces of the pillars *f*.

The ring *c* is constructed similarly to the rings *a b* except that they are not attached to the bell-holder. The joints of rings *c* are connected to brackets *d'*, which have a radially-sliding movement in guides *l* secured in the masonry wall of the cistern, the said brackets being each provided with a friction-roll *k* engaging the exterior of the bell-holder *A*. At intervals around the masonry wall are provided perforated brackets *f*<sup>2</sup> engaging the rings *c* and rigidly secured in recesses *w* in the masonry wall. The rods forming the ring *c* are provided with stops *e'* on each side of the brackets *f*<sup>2</sup> to prevent lateral movement of the ring *c*.

If the bell-holder *A* is subjected to lateral wind-pressure from one side this pressure will be received by the opposite side of the guiding-rings, and thereby transmitted equally to all of the pillars by rings *a b* and to the brackets *f*<sup>2</sup> by the ring *c*. It will be seen that the only pressure that can be exerted upon one of the pillars *f* will be a lateral horizontal pressure transmitted to it by the friction-rollers, and it will also be seen that the pressure exerted upon one pillar will be substantially the same as that exerted upon the others. By this construction therefore the strain in any direction is transmitted equally to all of the pillars, and it has been found by experience that it was only necessary to make the pillars of the same strength that the pillars are made in the ordinary scaffolding. As I employ only three pillars, whereas the number used in the scaffolding constructions amounts to eighteen (18) or over, I effect a great saving in the cost of erecting a gas-holder.

In Fig. 3 I have shown a very cheap construction, which can be employed for very

small gas-holders. In this figure *a* represents the bell-holder surrounded by a rope *a'* secured thereto. *f f* represent vertical poles, which preferably have their base set in masonry and their upper end supported by suitable guy-wires. (Not shown.) Rings or collars *e'* are arranged to slide vertically on the poles *f* and are connected by ropes *i* to the rope *a'* at points at opposite sides of the pole.

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

1. The combination with a gas-holding bell and the cistern therefor, of the vertical guiding-pillars, a ring secured to said bell adjacent to its upper part provided with parts having a vertical sliding engagement with said pillars, and a ring secured to the wall of the cistern having friction-rolls for engaging the bell, the supports for said latter ring having a radially-sliding movement with respect to the cistern-wall, substantially as described.

2. The combination with the gas-holding bell and the cistern therefor, of vertical guiding-pillars, a ring secured to said bell adjacent to its upper edge, said ring being provided with parts having a sliding engagement with said pillars, a ring surrounding said bell adjacent to the wall of the cistern, supports for said ring engaging radially-disposed recesses in the cistern-wall and movable radially therein, supports secured rigidly to said cistern-wall and engaging said ring between adjacent movable supports, and stops on said ring for engaging said rigid supports, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HEINRICH HACKER.

Witnesses:

PAUL ZUCKER,  
EUGEN COHN.