

(No Model.)

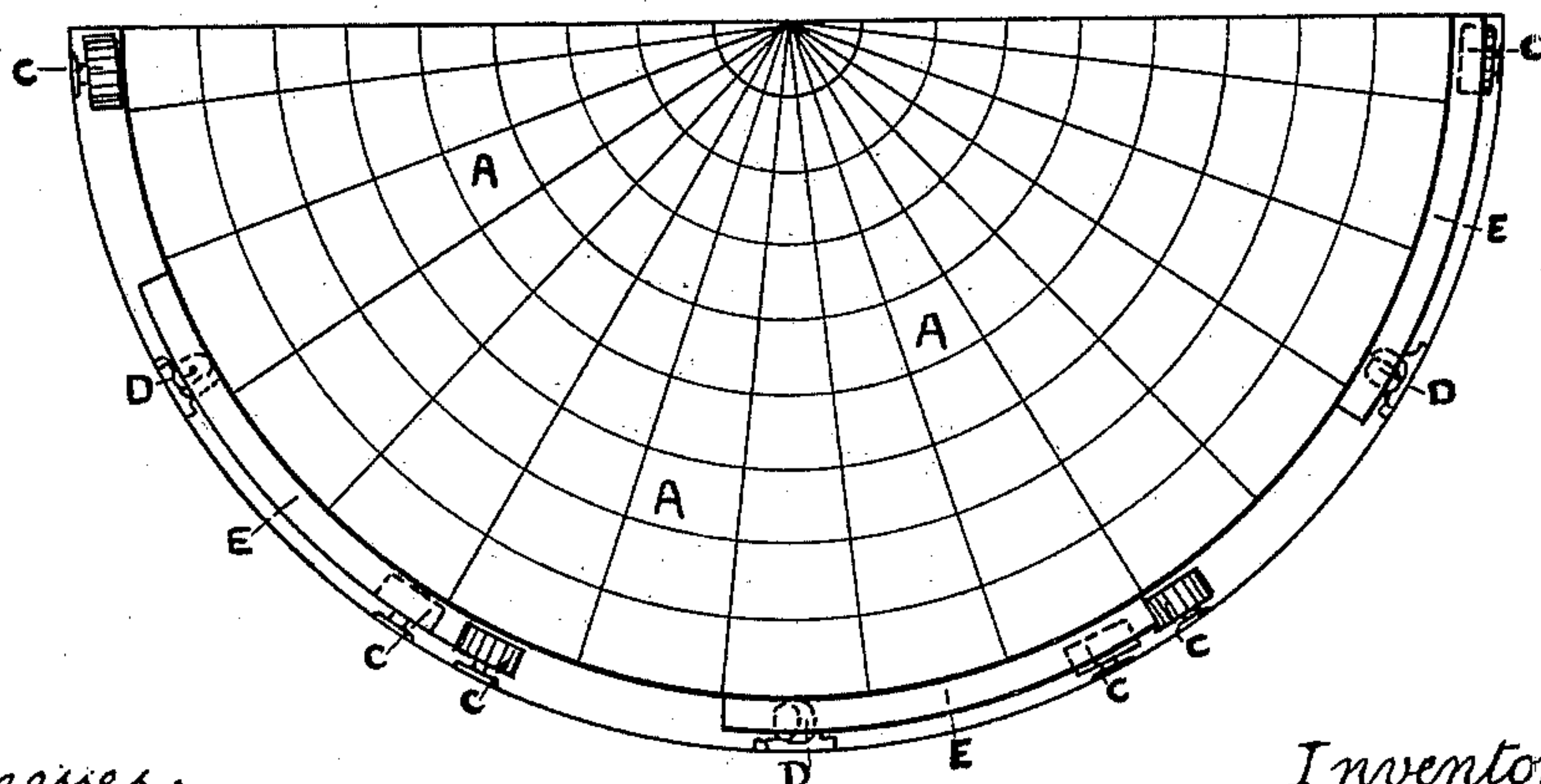
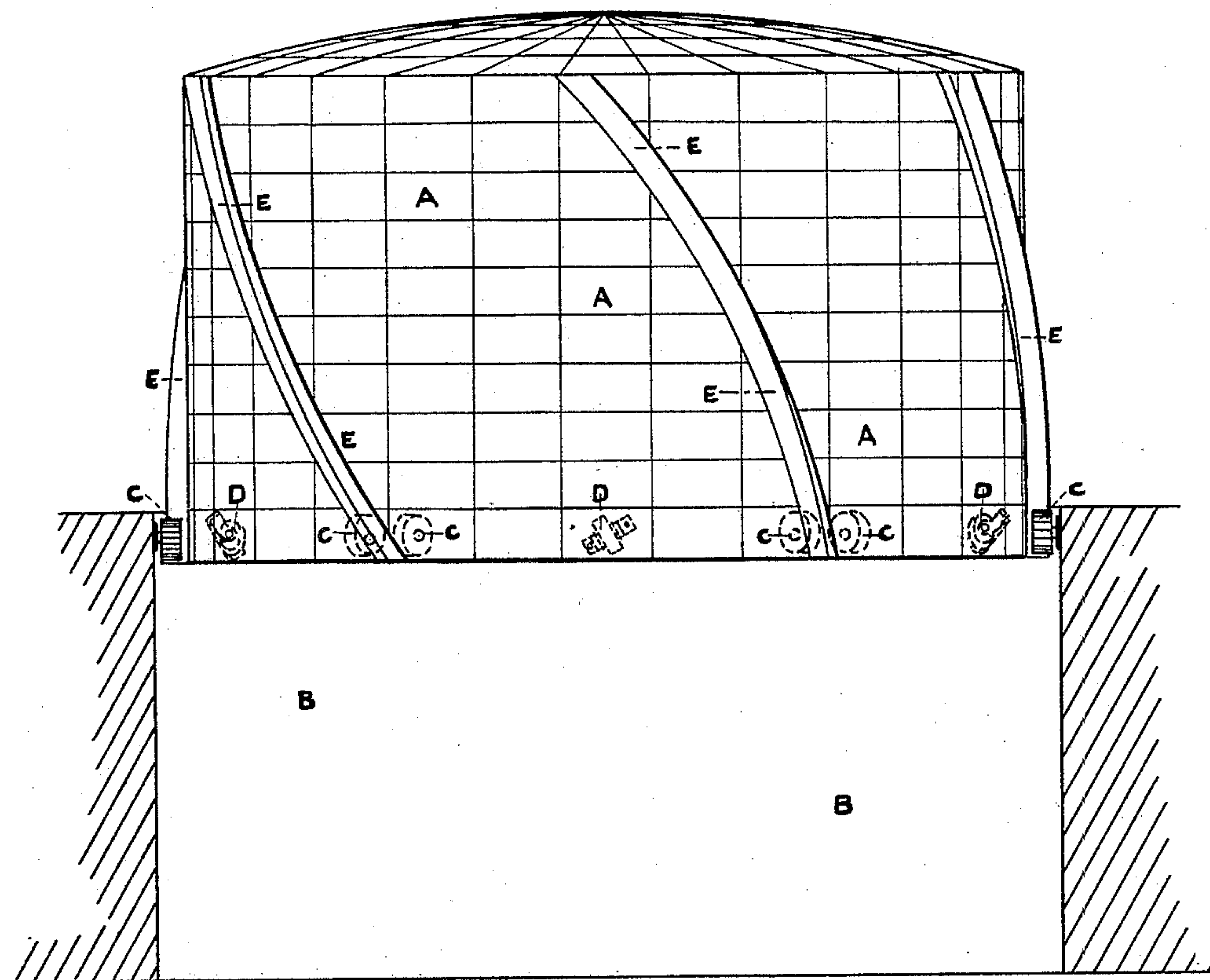
2 Sheets—Sheet 1.

W. GADD.
GAS HOLDER.

No. 405,702.

Patented June 25, 1889.

FIG. 1.



Witnesses:
George Frederick Gadd.
John Alexander Lovelock

Inventor.
William Gadd.

(No Model.)

W. GADD.
GAS HOLDER.

2 Sheets—Sheet 2.

No. 405,702.

Patented June 25, 1889.

FIG. 2.

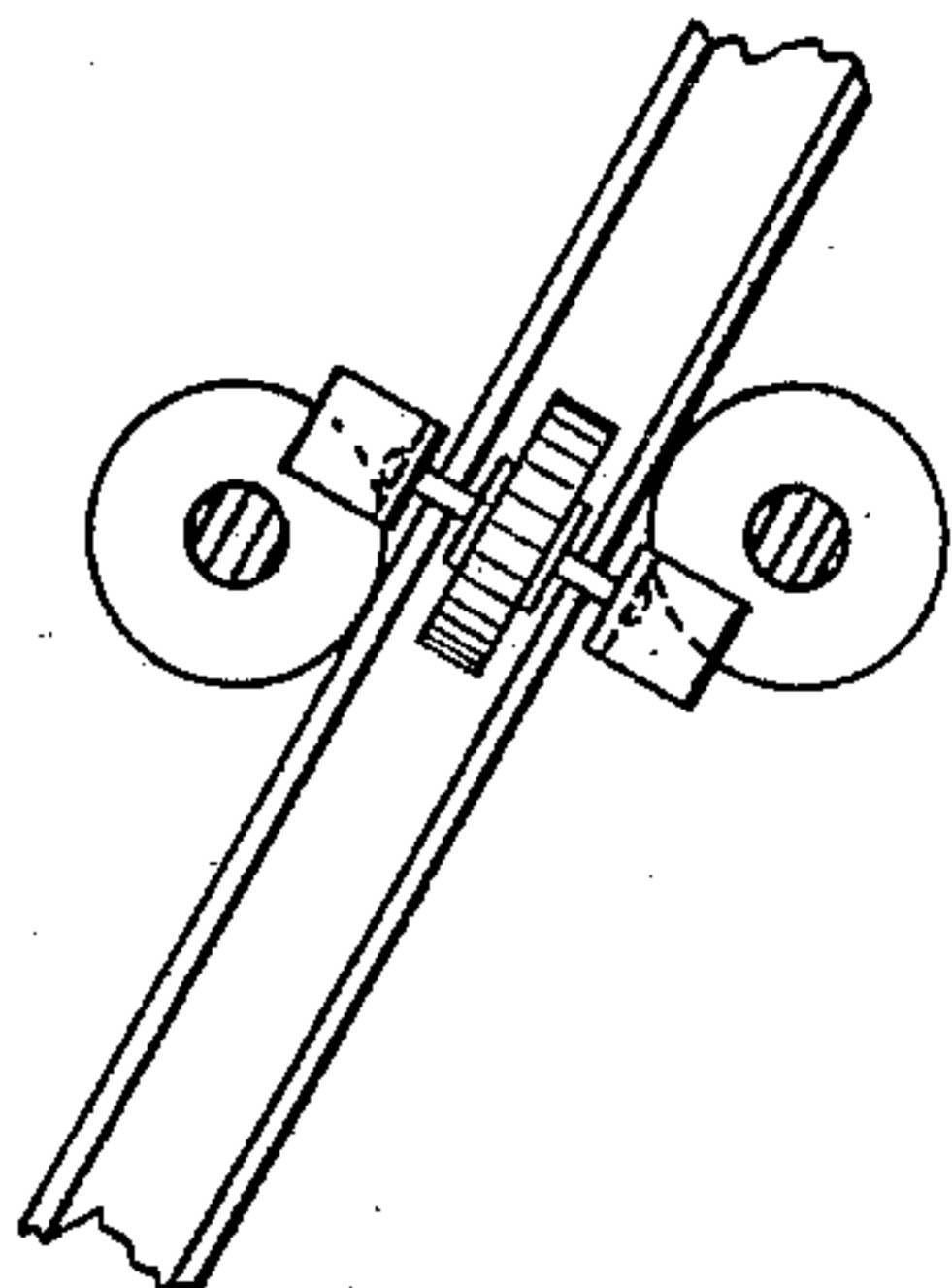


FIG. 3.

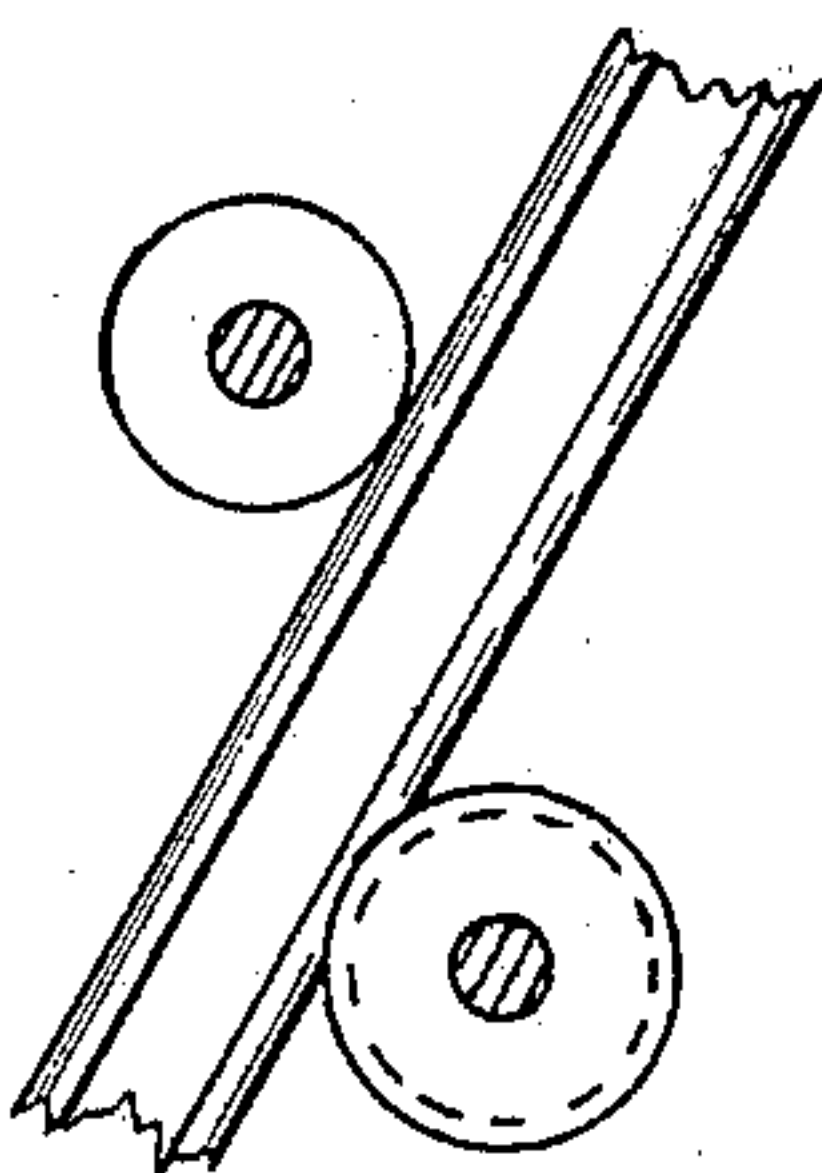


FIG. 4.

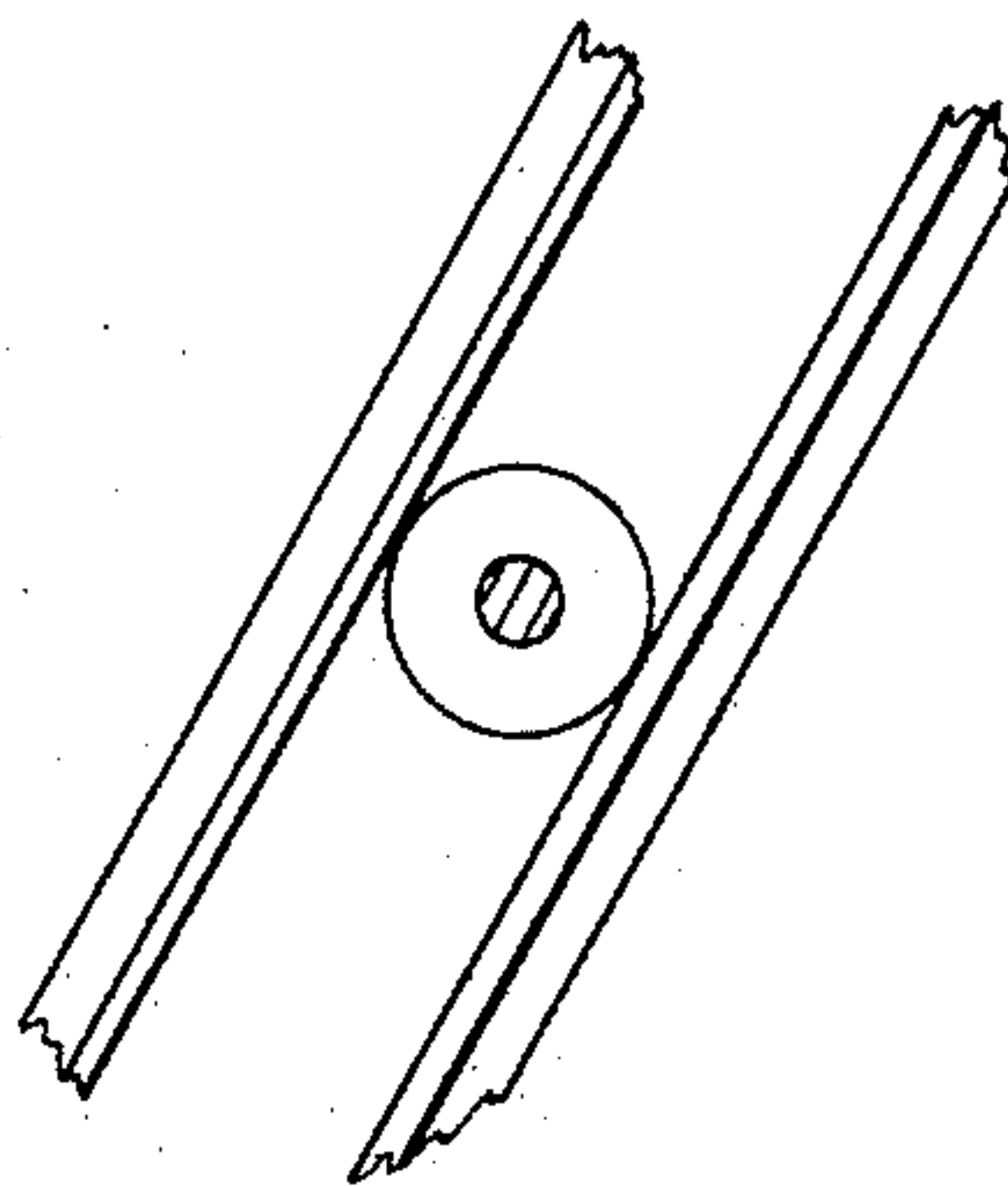


FIG. 5.

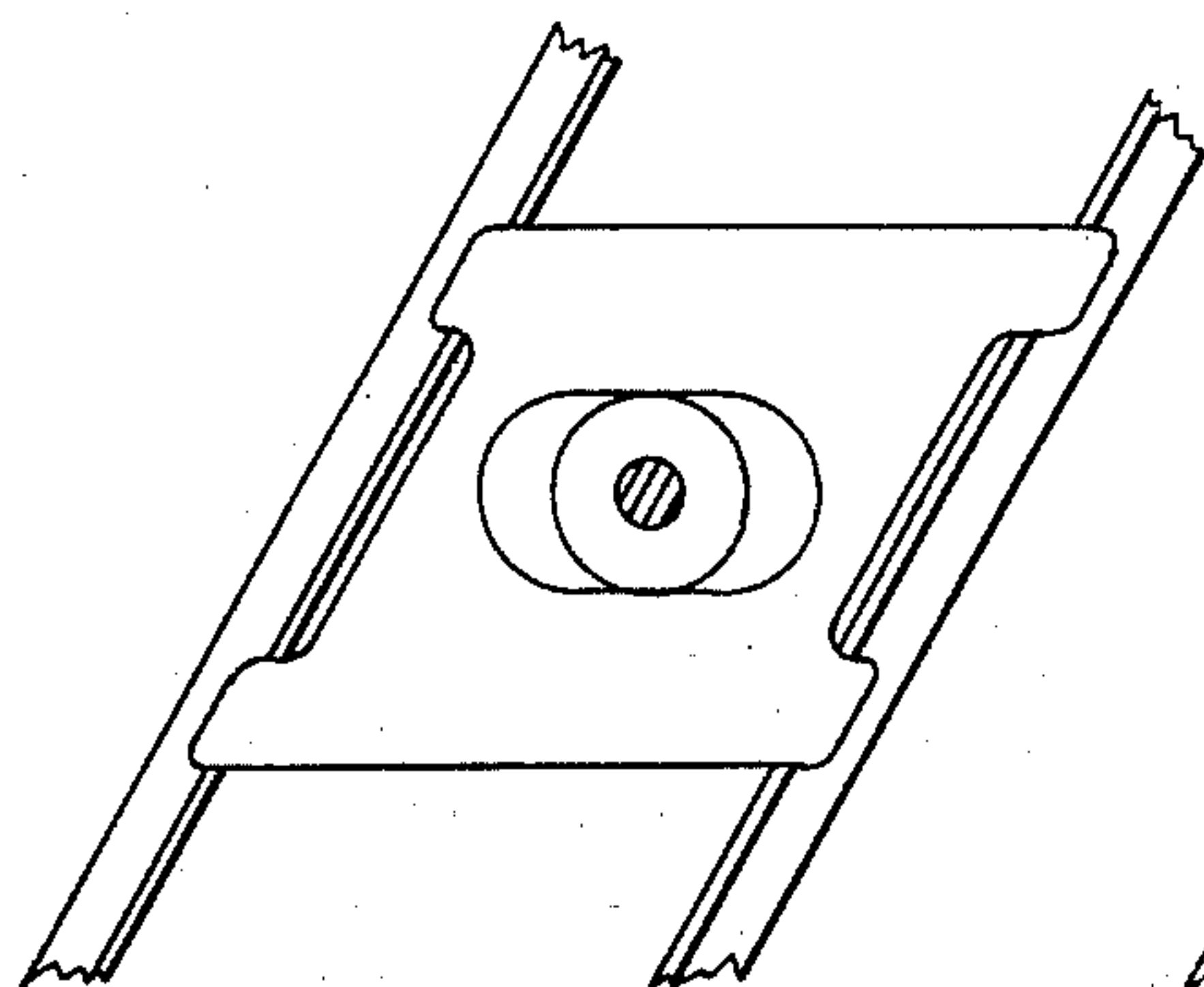


FIG. 6.

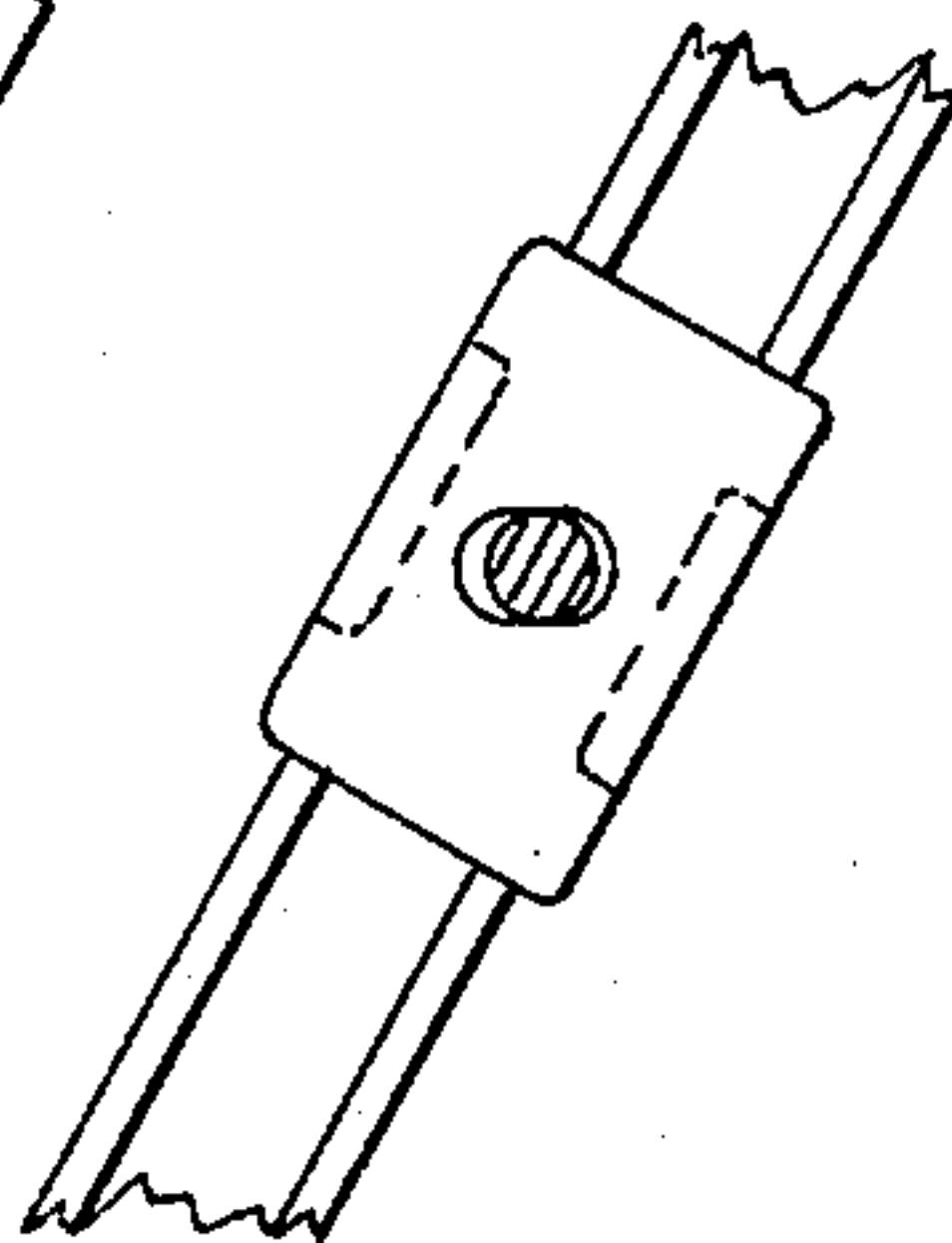


FIG. 7.

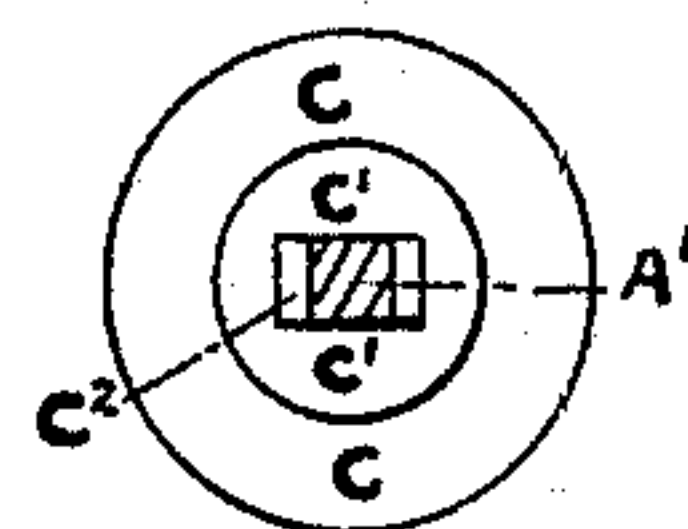
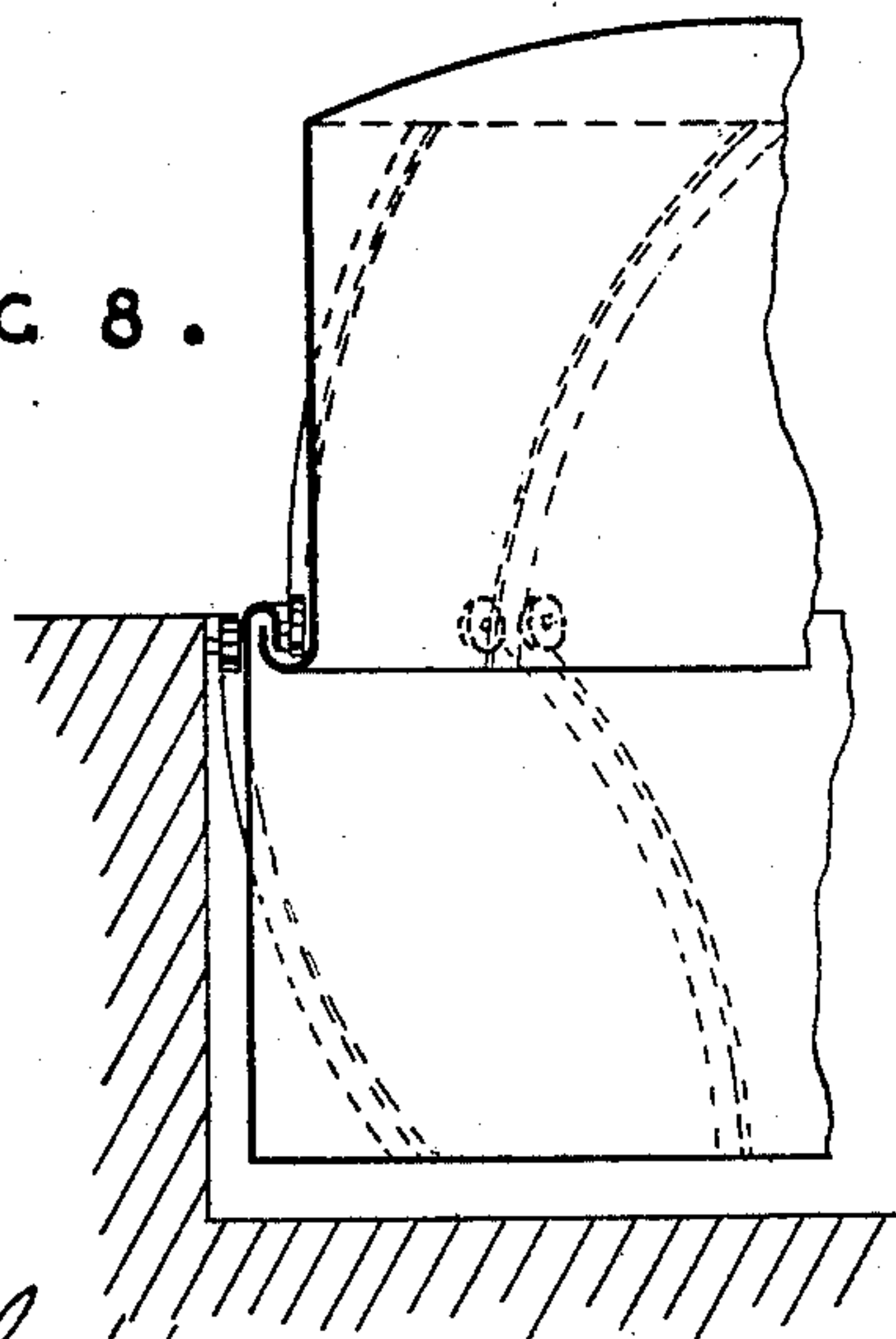


FIG. 8.



Witnesses:
George Frederick Gadd.
John Alexander Lovelock

Inventor.

William Gadd.

UNITED STATES PATENT OFFICE.

WILLIAM GADD, OF MANCHESTER, ENGLAND.

GAS-HOLDER.

SPECIFICATION forming part of Letters Patent No. 405,702, dated June 25, 1889.

Application filed February 18, 1889. Serial No. 300,384. (No model.) Patented in England October 6, 1887, No. 13,521; in Luxemburg August 13, 1888, No. 1,017; in Belgium August 16, 1888, No. 82,788; in Turkey August 24, 1888; in Canada August 28, 1888, No. 30,001; in Spain September 27, 1888, No. 8,584; in France October 6, 1888, No. 192,229; in New South Wales October 9, 1888, No. 988; in Cape of Good Hope October 11, 1888, No. 477; in Italy October 13, 1888, No. 23,942; in Natal October 17, 1888; in Tasmania October 20, 1888, No. 6,278; in Brazil October 31, 1888, No. 626; in Victoria November 13, 1888, No. 628/10; in Sweden December 20, 1888, No. 1,651, and in Norway December 29, 1888, No. 1,040.

To all whom it may concern:

Be it known that I, WILLIAM GADD, a subject of the Queen of Britain, and a resident of the city of Manchester, England, have invented new and useful Improvements in Gas-Holders, of which the following is a specification.

The improvements relate to the construction of gas-holders, and have for their object the supporting of the same in their working position in such a manner as to enable the external or upper guide-framing hitherto employed for that purpose to be dispensed with, and yet to give the requisite stability, although such or a modified form of framing may be employed in connection with the improvements herein described when desired, and the present improvements form a modification of an invention for the same purpose, for which I have already applied for Letters Patent, filed August 28, 1888, Serial No. 284,024.

To accomplish these my present improvements, I affix round the well or tank, at or near the upper surface thereof and at any suitable intervals, tangential or angled radial rollers, or both, or in lieu thereof angled fixed friction-pieces. Attached to the outer surface of the bell or holder, and extending from top to bottom thereof, or thereabout, are rails of metal or other suitable substance, which are formed in the shape of quick helices or spirals or curved inclines of any working degree of inclination, which will be determined by the circumstances and design, forty-five degrees and sixty degrees from the horizontal being examples of working angles; but other angles may be employed. The spiral rails on the holder take or gear into the spaces between the rollers or their equivalent friction-pieces, or it may be rollers and friction-pieces combined. As these spiral rails round the outer face of the holder rest and move upon the rollers or equivalents placed round the tank—by preference both over and under or between, according to the section of rail employed—it will be seen that as the holder be-

comes raised by being filled with gas a screw-like motion is imparted to it, thus causing it to partially turn as it rises, and in similar manner allowing it to fall by gravity as the volume of gas is reduced.

The stability of the holder lies in the fact that it is constantly at all working positions supported at an equal height round its circumference, and thus presents a position of firm resistance to wind-pressure and other lateral strains under conditions somewhat similar to that of a holder placed on the ground and resting on its lower edge or rim. The flanged or other wheels, rollers, sliding blocks, or equivalent devices may either be fixed tangentially with the side of the tank, and so come in contact with the top, or top and bottom, surfaces of the rails on the holder, or may be arranged radially with the tank, but at the angle of spiral; or, and by preference, the two kinds may be combined and the rolling-surface of the rails adapted thereto or in any other suitable manner, and the rollers or sliding pieces, or equivalent devices, when placed tangentially, may be employed above and beneath the rails alternately or in couples, or otherwise, the rails being constructed in double line or double headed or faced for the purpose.

The improvements are also applicable to telescopic gas-holders by employing similar helical or spiral rails, curved inclines, or grooves attached to the inner lift or lifts thereof, which ride upon or between the rollers or equivalent devices attached to the inner surface of the outer lift or lifts of such telescopic gas-holders; but that the invention may be better understood, I will, by the aid of the accompanying drawings, proceed more fully to describe means employed in carrying out the same.

In the drawings, Figure 1 represents an elevation with half-plan of a gas-holder in single lift raised to about its full height, and with the tank or well shown in section, of one arrangement in accordance with my inven-

tion; and Figs. 2, 3, 4, 5, 6, 7, and 8 show examples of some variations of detail in application of the method described.

The same letters indicate corresponding parts wherever they occur.

A A is the holder; B B, the tank or well within which the holder rises and falls by means of the helical, spiral, or inclined rails or surfaces E E riding on or between the rollers or equivalents.

C C are the tangential and D D the angled radial rollers, which in Fig. 1 are shown arranged separately from and alternately with the tangential rollers C C; but the two kinds of rollers may be arranged together, as shown in Fig. 2, wherein the rail may be formed of channel or other iron, or other substance, having a tangential roller on each side, with the angled radial roller between; or the angled radial rollers may be dispensed with by employing flanges on the tangential rollers; or other means may be employed for keeping the holder centrally or the rails or guides thereof on or between the rollers or equivalents.

Although, in the interests of safety, I greatly prefer to employ either two sets of rollers—one above and the other below the inclined or spiral rails—or double rails with one or more sets of rollers between, in order to enable the same to securely grasp or to be grasped by the rails at various points around the edge of the holder, nevertheless it may be possible in some cases to dispense with the under set of rollers or the over set of rails, as other means may be sufficient to cause the rollers to follow the inclines of the single rails.

In Fig. 3 the two sets of rollers are placed one below the other instead of in lines, and one of them is shown flanged.

In Fig. 4 two rails to each roller are shown, or it may be inclined recesses on the face of the holder, by which variation the locking action or grasp is obtained by one set of rollers.

Figs. 5 and 6 show two forms of sliding blocks or pieces which may be employed in lieu of rollers and either in conjunction or not with the angled radial rollers.

To enable allowance to be made for imperfections in the construction of the helical, spiral, or inclined rails, or for the effects of expansion or contraction therein, the studs attached to the curb or ring of the tank carrying

the tangential rollers may be arranged to have radial play within the central boss on which the rollers turn, as shown in Fig. 7, in which the tangential roller C C turns on the boss C' C', having formed therein the slot C² C², for to enable the projection or stud A', attached to the ring of the tank, to pass through; or other devices for radial action may be employed. A similar arrangement is shown for the sliding pieces in Figs. 5 and 6.

Fig. 7 is a part section showing the application of the invention to a double-lift or telescopic holder, wherein the outer or lower lift is provided with rollers in manner similar to the tank or well for the purpose of allowing the inner lift, provided with spiral guides, to rise and fall thereon. In like manner a third lift may be employed, or more.

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

1. In gas-holders, the combination of rollers or equivalent friction-pieces, affixed to the edge or wall of the tank or well, with spiral guides on the outer face of the bell, substantially as set forth.

2. In gas-holders, the combination of tangential rollers or equivalent friction-pieces, affixed to the edge or wall of the tank or well, with spiral guides on or in the outer face of the bell, substantially as herein set forth.

3. In gas-holders, the combination of angled radial rollers or equivalent friction-pieces, affixed to the edge or wall of the tank or well, with spiral guides on or in the outer face of the bell, substantially as herein set forth.

4. In gas-holders, the combination of both angled radial rollers and tangential rollers or their equivalent friction-pieces, affixed to the edge or wall of the tank or well, with spiral guides on or in the outer face of the bell, substantially as herein set forth.

5. In telescopic gas-holders, the combination of rollers or equivalent friction-pieces, affixed to the inner face of an outer lift, with spiral guides on the outer face of an inner lift, substantially as herein set forth.

Signed at Manchester, England, December 31, 1888.

WILLIAM GADD.

Witnesses:

JOHN LOVELOCK,
EDWIN MANSFIELD.