No. 757,627. PATENTED APR. 19, 1904.

S. KOŹMINSKI.

DRY GAS METER.

APPLICATION FILED AUG. 29, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

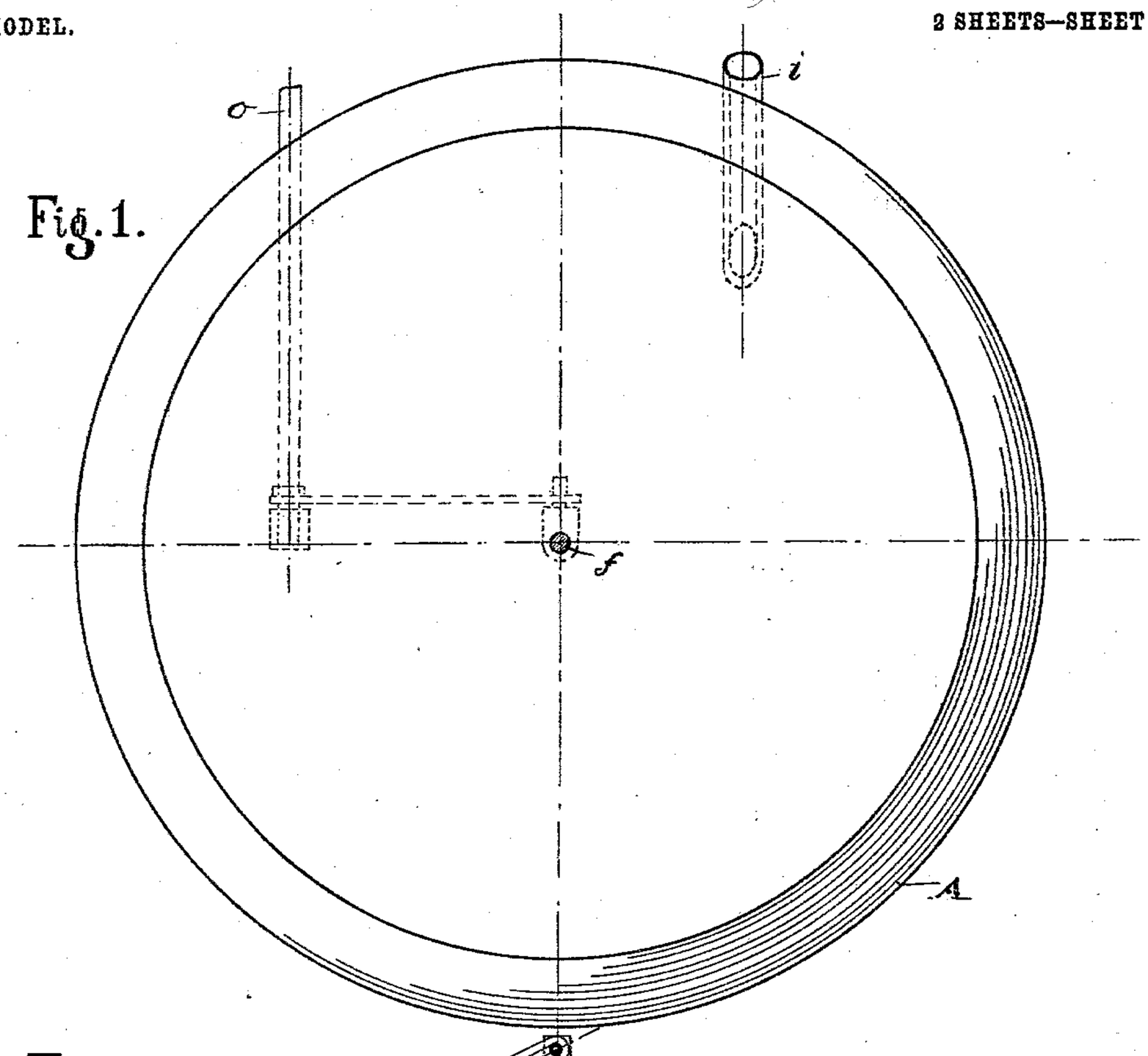
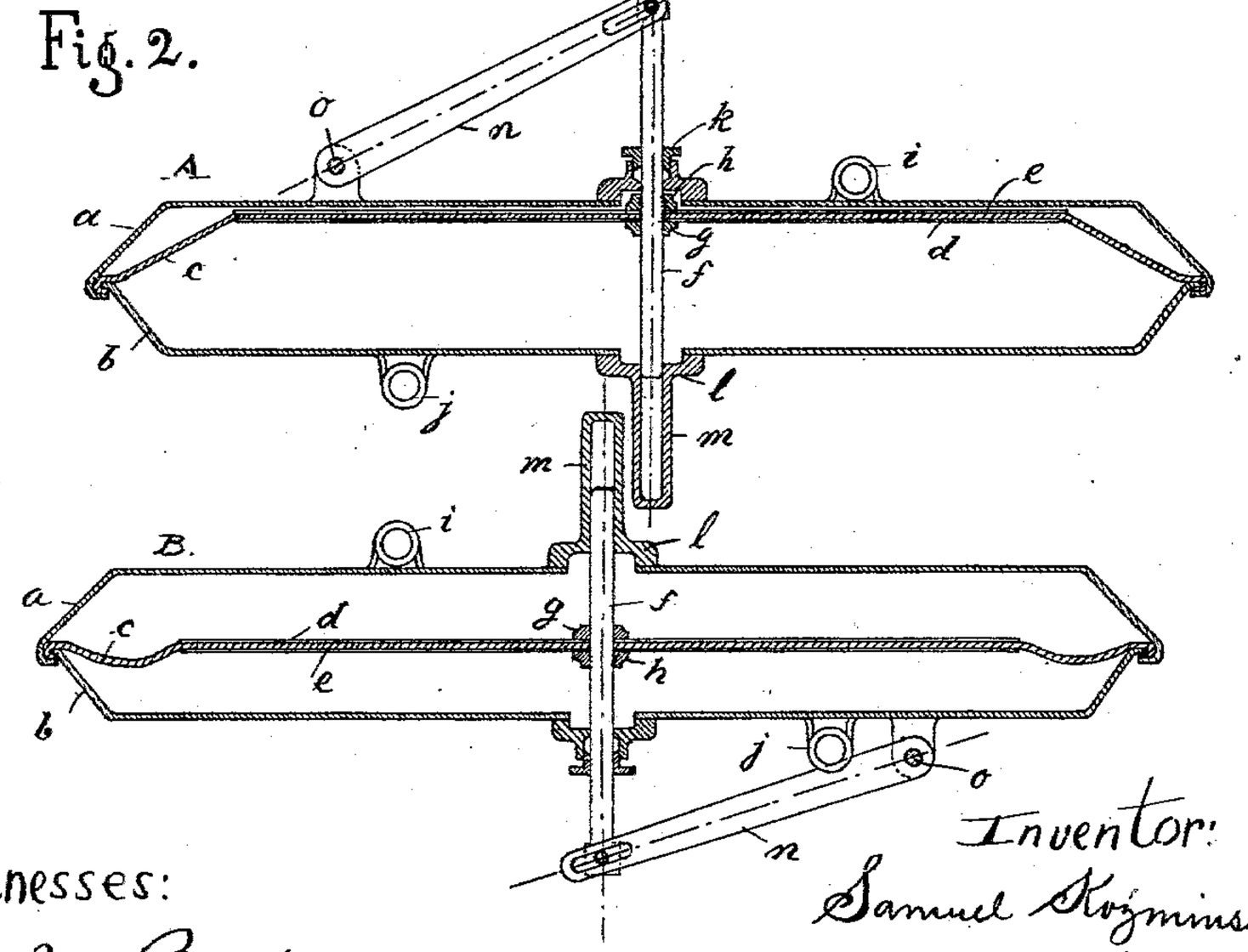


Fig. 2.



Witnesses:

E. M. Brandt.

H. S. Brandt.

Inventor:

Samuel Koźminski

By Marion & Marion

Attorneys.

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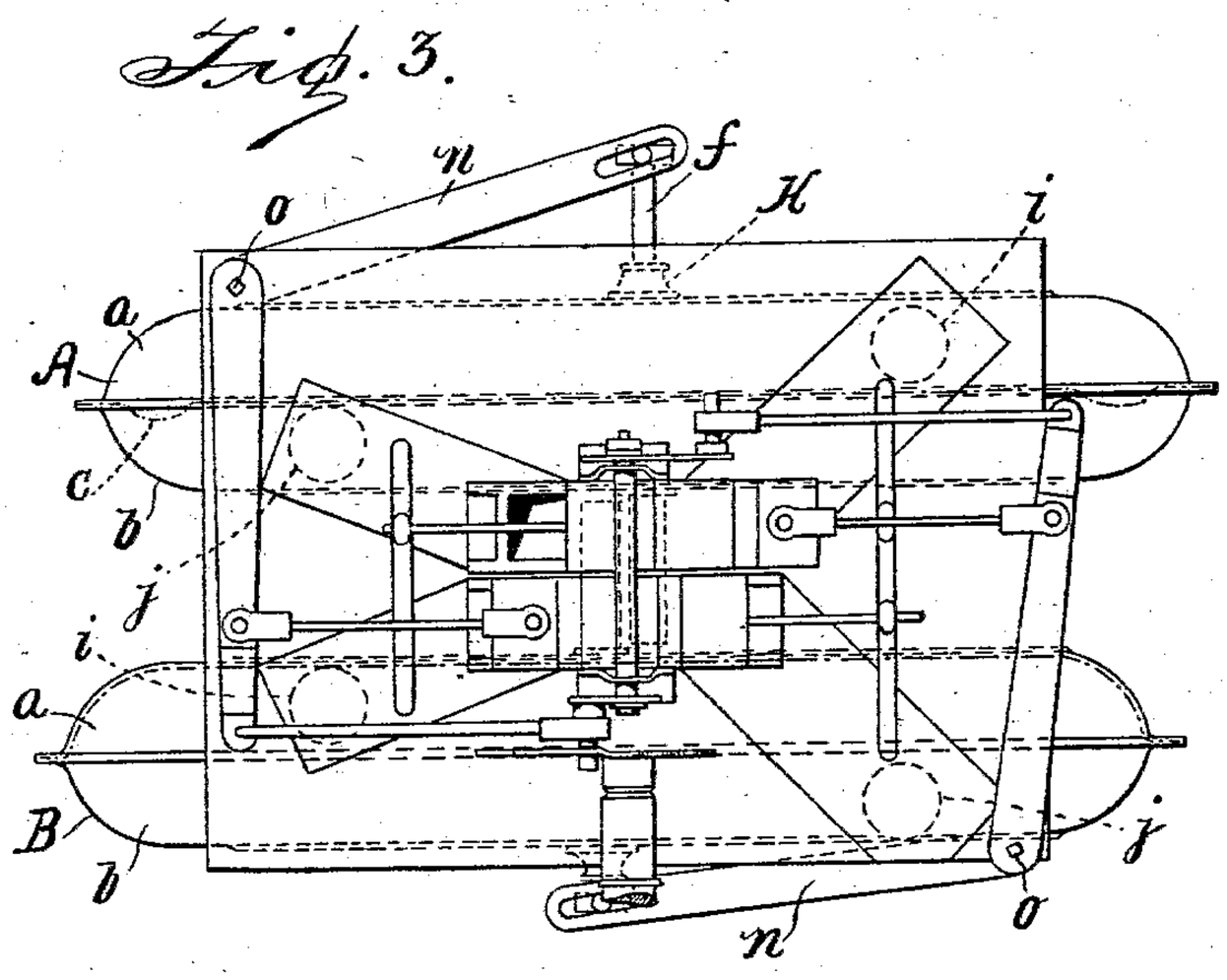
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.



Witnesses
Jas A. Koehl
C. F. Reichenbach.

Inventor
Samuel Kożminski.
By A. B. Wilkeson
Attorney

No. 757,627. Patented April 19, 1904.

UNITED STATES PATENT OFFICE.

SAMUEL KOŹMINSKI, OF CHARLOTTENBURG, GERMANY, ASSIGNOR TO THE FIRM OF VESTA, FABRIK AUTOMATISCHER GASMESSER G. M. B. H., OF CHARLOTTENBURG, GERMANY.

DRY GAS-METER.

SPECIFICATION forming part of Letters Patent No. 757,627, dated April 19, 1904.

Application filed August 29, 1902. Serial No. 121,505. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL KOŹMINSKI, a subject of the King of Prussia, German Emperor, and a resident of No. 39 Wilmersdorferstrasse, Charlottenburg, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Dry Gas-Meters, (for which I have made application for useful model in Germany, dated January 30, 1902, not numbered yet,) of which the following is a specification.

My invention relates to improvements in dry gas-meters; and the object of my invention is to secure, as much as can practically be obtained, steadiness and accuracy of the indications of the meter. Such steadiness and accuracy hitherto have been missing in dry gas-meters, for the reason that the membrane or diaphragm of the bellows constituting the measuring-chambers of the meter when forced into either of its extreme positions by the pressure of the gas is much liable to forming plaits or folds of varying shape and size, whereby the capacity of the measuring-chambers is not constant. Though the variations of the capacity caused by such plaits or folds in the flexible material of the bellows be but slight, they are summed up by the frequent reciprocations of the membrane or diaphragm, and accordingly the records of the meter are neither true nor constant.

The object of my invention is to prevent the formation of plaits or folds in the flexible material of the bellows, which used to consist of leather or gas-tight fabrics, in either of the extreme positions of the bellows, and I obtain said object by providing suitable means for guiding the membrane or diaphragm of the two or several reciprocating bellows of the meter in their movements from one end to the other of its extreme positions.

In the accompanying drawings, Figure 1 is a plan of one of the two or several measuring-chambers of the dry gas-meter. Fig. 2 is a central section through the two chambers of the meter, juxtaposed, as usual, and working within a gas-tight box or casing in a well-known manner. Fig. 3 is a side elevation of the complete apparatus, showing the surrounding box of the two measuring-chambers, the slide-valves alternately connecting the two gas-ports with the discharge-pipe, and the mechanical means for transmitting motion to said slide-valves.

As clearly shown by Fig. 2, each of the two measuring-chambers A and B consists of two halves *a* and *b*, preferably of sheet metal and jointed at the periphery by making their edges overlap each other, the edge of the flexible membrane or diaphragm *c* being engaged between the two edges of the parts *a* and *b* of the chamber, thereby forming a gas-tight joint. The gas alternately entering into one of the ports *i* and *j* reciprocates the membrane or diaphragm *c* from one of its extreme positions (shown in chamber A) to the other extreme position, (indicated by dotted lines in chamber A.) While in chamber A the membrane or diaphragm *c* has reached its extreme position, the membrane or diaphragm *c* in the other chamber, B, will take about an intermediate position, the positions of the two membranes or diaphragms in the two chambers being never the same, but following each other to secure a continuous flow of gas and to overcome the dead-point of the crank-shaft by which the slide-valves are controlled and the recording-gear actuated. The main portion of said membrane or diaphragm *c* is engaged between two disks *d* and *e*, preferably of sheet metal, riveted or otherwise secured to the flexible disk *c*. A rod *f* centrally traverses the membrane or diaphragm *c* and its two holding-disks *d* and *e*, the said rod *f* being tightly secured to the disks *d* and *e* by means of a collar *g*, integral with the said rod *f*, and a nut *h*, screwed to a thread of the said rod *f*. By the reciprocating motions of the two membranes or diaphragms *c* in the two chambers A and B the two rods *f* will equally receive a corresponding regular to-and-fro motion in the direction of their length. To obtain a perfect straightness of motion of the said rods *f*, and accordingly also of the two membranes or diaphragms *c*, with their holding-disks *d* and *e*, the said rods *f* are guided,

respectively, in a stuffing-box *k* and on the other side of the membrane *c* in a bearing *l*, having a tubular extension *m*. Owing to such exactly-straight motion of the rods *f* and the parts secured thereto, the membranes or diaphragms *c* on arriving in their extreme positions of their reciprocating throw will assume the shape of a truncated cone, as clearly shown in chamber A, Fig. 2. No plaits or folds will occur in the flexible membrane or diaphragm. The capacity of the measuring-chamber, formed by the two extreme positions of the membrane or diaphragm *c*, in consequence will remain the same in every throw, and the indications of the gas-meter will be steady and accurate, which result could not be obtained in dry gas-meters the membranes of which had no guiding means in their reciprocating movements. One end of each of the two rods *f*, extending from the box through the stuffing-box *k*, is linked to a lever *n*, the other end of which is secured to a shaft *o*. The oscillating motions of the two shafts *o* are transmitted to a common shaft in a manner to impart a continuous rotating motion to the said shaft, which commands the slide-valves and also drives the recording-gear of the gas-meter. The mode of obtaining continuous rotary motion of a shaft from two oscillating shafts receiving motion from the reciprocating bellows of a gas-meter is clearly shown in Fig. 3 of the drawings.

While the disposition of the lever *n* and shaft *o* as herein shown is what is deemed preferable, it is evident that their locations may be changed to suit existing circumstances.

I claim as my invention—

1. In a dry gas-meter, a plurality of chambers, a diaphragm in each chamber, a rod passed through and adjustably secured to each diaphragm, guides on the adjacent faces of said chambers for adjacent ends of said rods, stuffing-boxes on the opposite sides of said chambers through which said rods pass, links provided with slots at one end receiving means on the outer ends of said rods, and oscillatory shafts to which the opposite ends of said links are connected, all substantially as and for the purpose specified.

2. In a dry gas-meter, a plurality of chambers, a reciprocatory diaphragm in each chamber, rods passed through and adjustably secured to each of said reciprocatory diaphragms, guides on the adjacent faces of said chambers for the adjacent ends of said rods, stuffing-boxes on the opposite sides of said chambers through which said rods pass, links provided with slots at one end to receive means on the outer ends of said rods, and oscillatory shafts to which the opposite ends of said links are connected, all substantially as and for the purpose specified.

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

SAMUEL KOŹMINSKI.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.