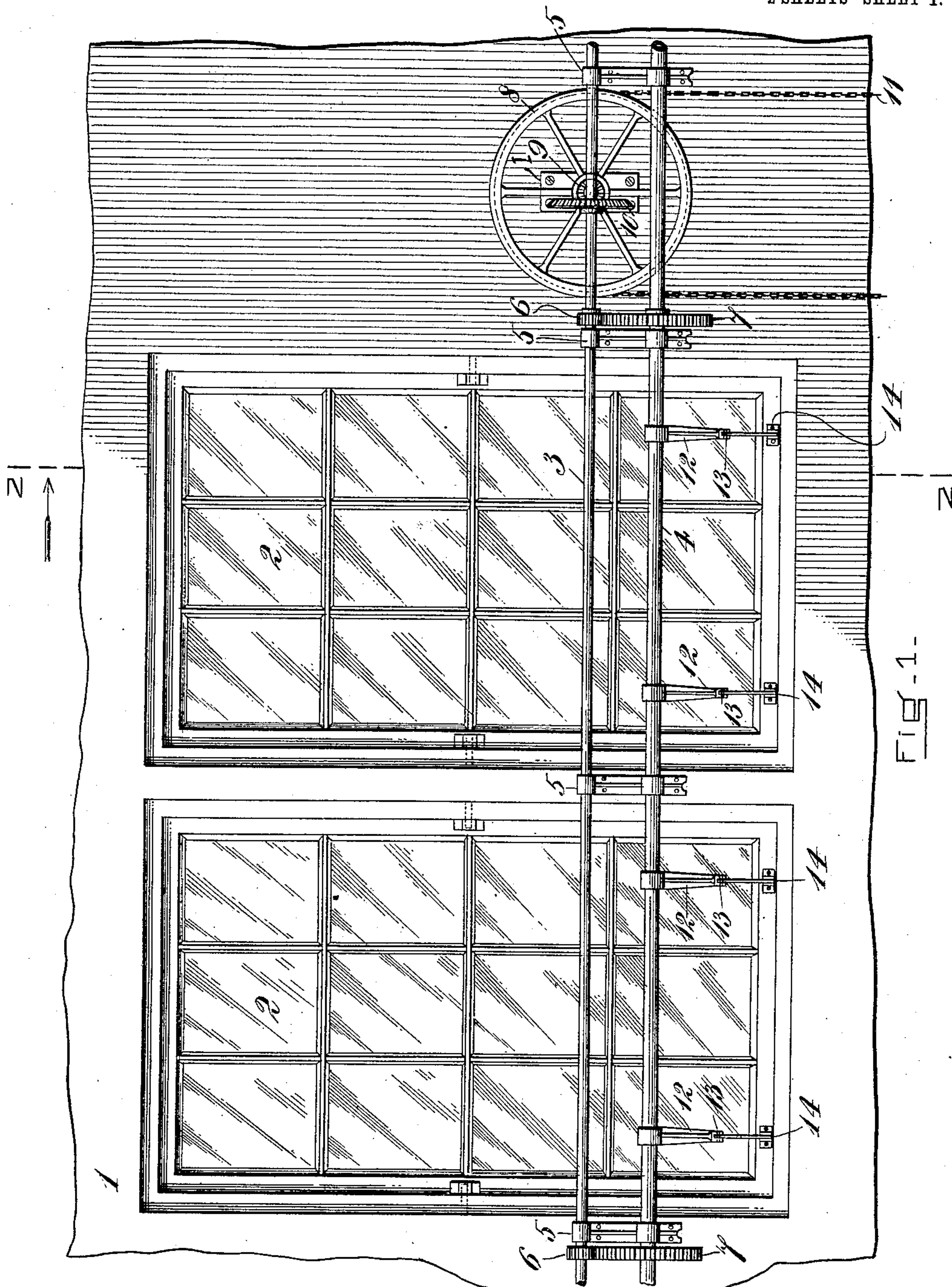


E. VAN NOORDEN.
MECHANISM FOR OPERATING WINDOWS OR SHUTTERS.
APPLICATION FILED DEC. 1, 1908.

931,239.

Patented Aug. 17, 1909.

2 SHEETS—SHEET 1.



WITNESSES=

M. E. Flaherty
W. P. O'Brien

INVENTOR=

Ezekiel Van Noorden
by his atty
Charles Raymond & Co.

E. VAN NOORDEN.
MECHANISM FOR OPERATING WINDOWS OR SHUTTERS.
APPLICATION FILED DEC. 1, 1908.

931,239.

Patented Aug. 17, 1909.
2 SHEETS—SHEET 2.

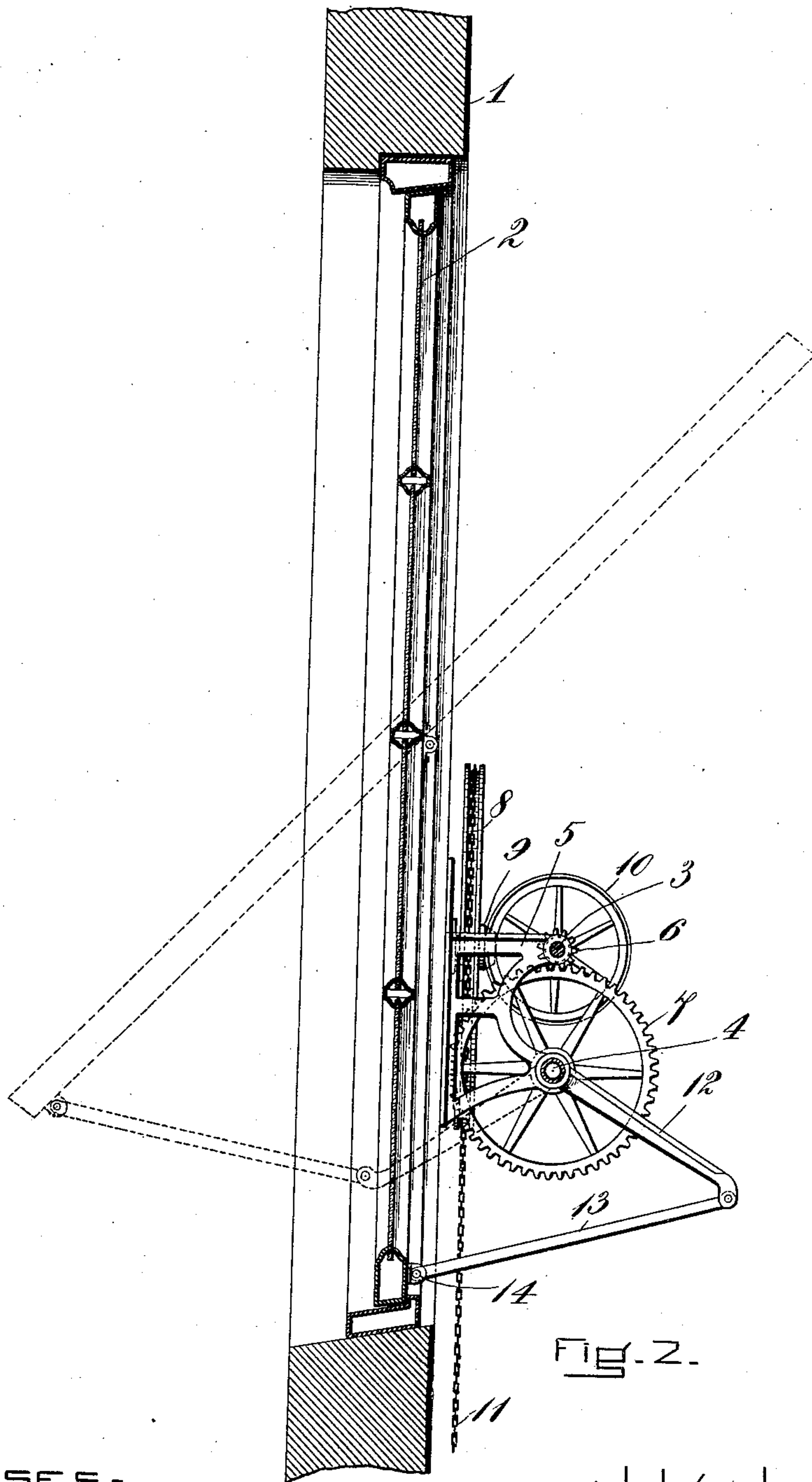


FIG. 2.

WITNESSES:
M. E. Flaherty
W. P. O'Brien

INVENTOR:
Ezekiel van Noorden
by his atty
Clark Raymond & Co.

UNITED STATES PATENT OFFICE.

EZEKIEL VAN NOORDEN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO E. VAN NOORDEN COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MECHANISM FOR OPERATING WINDOWS OR SHUTTERS.

No. 931,239.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed December 1, 1908. Serial No. 465,501.

To all whom it may concern:

Be it known that I, EZEKIEL VAN NOORDEN, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Mechanism for Operating Windows or Shutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

My invention relates to a mechanism especially designed for operating a series of pivoting windows or shutters by which they may simultaneously be opened or closed from a central point or station.

The construction embodying my invention can best be seen and understood by reference to the drawings, in which for purposes of illustration it is shown in connection with centrally pivoted windows.

Figure 1 shows the mechanism in front elevation. Fig. 2 is a section taken on line 2—2 of Fig. 1.

Referring to the drawings:—1 represents a portion of the side of a building or other supporting fixture in which are set a series of pivoting windows 2. Extending alongside these windows and preferably inside the building are the respective shafts 3 and 4 which at times will hereinafter be referred to as the primary and secondary shafts. These shafts are parallelly arranged and turn in brackets 5 attached to the supporting fixture 1. The primary shaft 3 is preferably a solid shaft while the secondary shaft 4 may be and is preferably a hollow pipe shaft.

Intermittently arranged upon the shaft 3 are small pinions 6. It is desirable that these pinions be not too widely separated from one another along the shaft. The pinions 6 intermesh with large gears 7 arranged upon the shaft 4 by which this shaft through the coöperation of the connecting gears and pinions may be operated from off the primary shaft 3 as this shaft is turned. The primary shaft is turned or rotated by means of a wheel 8 arranged alongside it upon any suitable fixture or support as the fixture 1. This wheel carries a bevel gear 9 engaging a bevel gear 10 on the primary shaft. The wheel 8 may be turned by hand or in any

other suitable manner. As shown the wheel is turned by a chain 11 running over it. 55

Attached to the secondary shaft 4 are a series of arms 12 each one of which has in it a joint 13. These arms pivotally connect with the respective windows preferably at points below their trunnions or points of pivotal turning as points 14. There are preferably two arms 12 extending from the secondary shaft to connect with each one of the respective windows. The construction of the arms 12 and their relative disposition or arrangement is such that when the windows are in a closed position each one of the arms will extend forward from the secondary shaft and thence back from the joint 13 in the arm to connect with the window with the effect that as the secondary shaft is turned the window will either be opened by the straightening of the arm or closed by its contraction, the operation of the arms depending upon the direction the secondary shaft is turned, and this depending, of course, upon the direction the hand wheel 8 is turned for operating the primary shaft. 70

From the aforesaid description it will be understood that the operation of opening and closing the windows is occasioned simply by turning the wheel 8 in one direction or the other. 80

In relation to the construction and operation of the mechanism comprising my invention, attention is especially directed to the fact that by reason of the small size of the pinions 6 on the primary shaft in relation to the gears 7 on the secondary shaft a relatively slight degree of power need necessarily be applied for turning the secondary shaft and operating the windows. In other words, by reason of the leverage provided by the large gears 7 the power of the primary shaft when rotated is multiplied or increased for rotating the secondary shaft and operating the windows. The benefit of this is that there will be no torsion or twisting of the primary shaft in the operation of the mechanism even though the shaft be a very long one with many windows as is oftentimes the case for then, were the secondary shaft and connecting mechanism to exert a high degree of resistance, the primary shaft would be likely to become twisted by reason of the power 105

which need necessarily be applied for turning it and this would preclude a proper acting of the mechanism for operating the windows. Attention is directed to the fact also
5 that the gears upon the primary and secondary shafts, intermittently arranged as they are upon these shafts, act to no slight degree in preventing a distortion or twisting of the shafts.

10 Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States:—

15 1. A mechanism of the character specified having a primary and a secondary shaft arranged to extend alongside the windows to be operated, means whereby said primary shaft may be turned, means whereby said

secondary shaft may be turned from off said primary shaft, and means for operating said windows off said secondary shaft. 20

2. A mechanism of the character specified having a primary and a secondary shaft arranged to extend alongside the windows to be operated, means whereby said primary shaft may be turned, means whereby said
25 secondary shaft may be turned from off said primary shaft, and jointed connections attached to said secondary shaft to extend forward therefrom and thence back to engage said windows.

EZEKIEL VAN NOORDEN.

Witnesses:

JOHN E. R. HAYES,
M. E. FLAHERTY.