

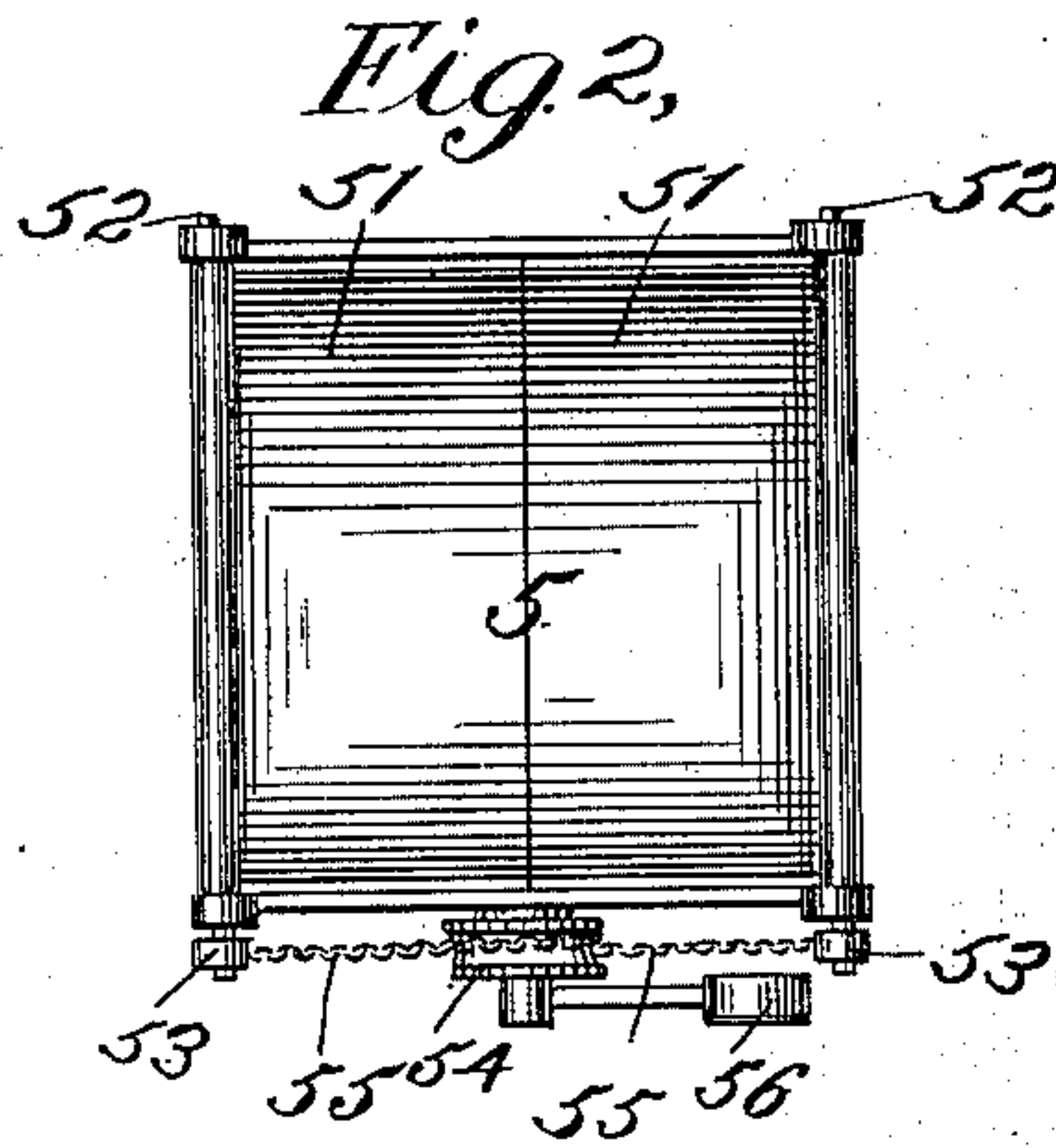
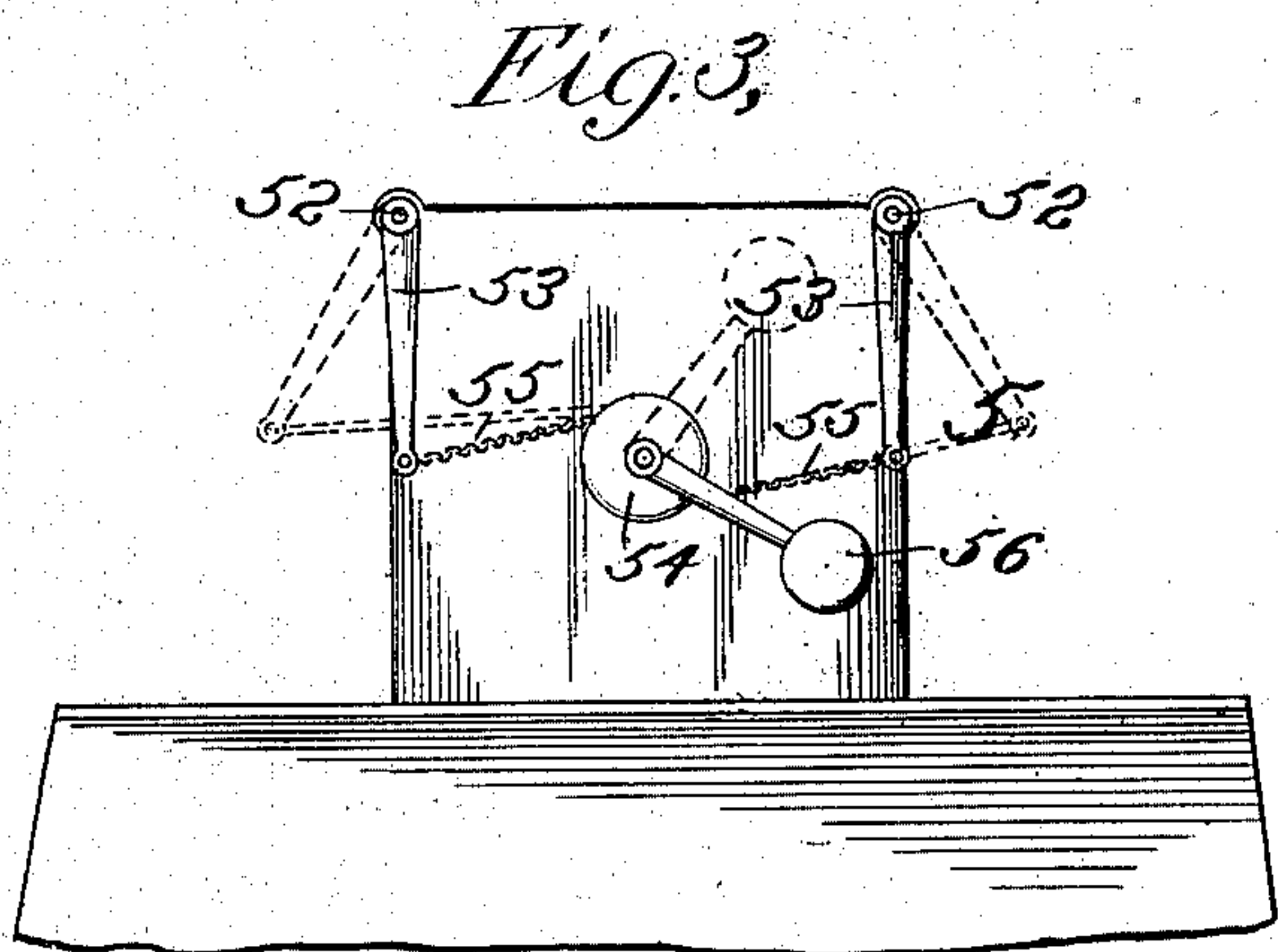
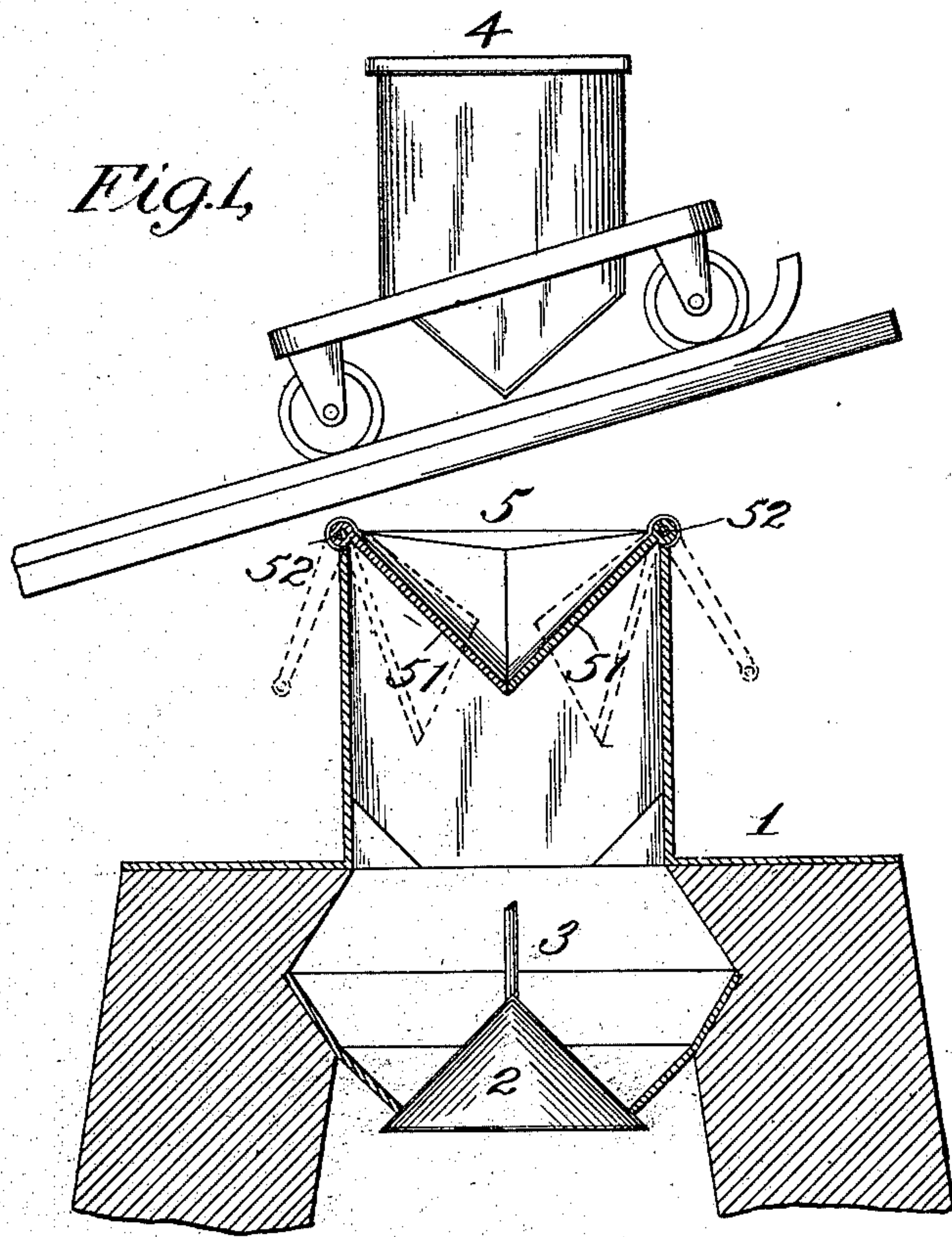
No. 736,353.

PATENTED AUG. 18, 1903.

G. W. BOLLMAN.
BLAST FURNACE.

APPLICATION FILED FEB. 24, 1903.

NO MODEL.



WITNESSES:

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GEORGE W. BOLLMAN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO OTIS ELEVATOR COMPANY, OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BLAST-FURNACE.

SPECIFICATION forming part of Letters Patent No. 736,353, dated August 18, 1903.

Application filed February 24, 1903. Serial No. 144,849. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BOLLMAN, a citizen of the United States, and a resident of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Blast-Furnaces, of which the following is a specification.

My invention relates to improvements in seals for blast-furnaces. In blast-furnaces it is of vital importance that the charge or stock be dropped into the hopper over the center of the bell, so that it may be distributed equally inside of the furnace. An uneven distribution of the stock has a ruinous effect upon the lining of the furnace.

The object of my improvement is to provide a self-closing seal for blast-furnaces which will always drop the stock into the hopper directly over the center of the bell, even though the charging-car is not directly over the center of the bell, and to provide means for operating said seal by mechanism which is not in the way of the stock; and my invention relates to the construction and arrangement of certain parts described in the following specification and definitely pointed out in the claims.

Referring to the drawings, Figure 1 represents in elevation the top of a blast-furnace with my improvement attached. Fig. 2 shows a plan view of the self-centering seal which embodies my invention. Fig. 3 shows the same in elevation.

Similar figures of reference indicate corresponding parts in the several figures.

1 represents in section the top of a blast-furnace of ordinary construction.

2 is the bell which opens and closes the lower end of the hopper 3 of the furnace.

4 is a charging-car which brings the stock to the top of the furnace and dumps it into the hopper 3.

5 is the seal to the furnace and consists of two clam-shell-shaped leaves 51 51, attached to the shafts 52 52.

53 53 are arms keyed to these shafts and connected to a drum 54 by chains 55 55.

56 is a counterweight connected to the drum 54.

The shafts 52 52 are free to turn in suitable bearings to allow the leaves 51 51 to drop

down into the position indicated by the dotted lines. The arms 53 53 will be moved through the chains 55 55, the drum 54 will be turned, and the counterweight 56 be raised.

It is sometimes desirable to construct the seal with more than two leaves, and this can be done so long as they are connected by suitable gearing, so that they must move together. All the gearing and mechanical connections between the leaves are placed outside of the hopper, where they are out of the way of the stock.

The operation of this device is as follows: When the stock is dropped from the car 4 into the furnace, it strikes the leaves 51 51 of the seal and by its weight causes them to open. It makes no material difference if this load is not dropped from the car directly over the center of the furnace, as the opening of the seal will center it and drop it into the hopper directly over the center of the bell. This result is obtained by the gearing of the leaves 51 51 to the drum 54 through the arms 53 53 and chains 55 55, above described, so that they will both move the same distance from the center. The bell may be opened and closed in any of the well-known ways. After the load has been discharged through the seal the counterweight 56 will cause the drum to be turned back to its normal position, and this will again close the leaves of the seal by means of the chains 55 55 and the arms 53 53, and it will remain closed until it is again opened by another charge of stock from the car 4. The seal will be opened, as described, by the weight of the stock falling upon it and closed automatically by the counterweight 56; but it can be arranged when desired to be opened and closed by some external force.

As the arms 53 53, chains 55 55, drum 54, &c., are outside of the hopper, they are out of the way of the stock, so that they operate with great efficiency and do not interfere with the proper distribution of the stock, which is a common defect in former arrangements.

Without limiting myself to the precise construction and arrangements of parts shown and described, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a furnace, a hopper

closed at its lower end by a bell, and at its upper end by a seal consisting of two or more leaves, mechanically connected outside of said hopper so that when opened they will
5 all move simultaneously an equal distance from the center of the bell, substantially as described.

2. In combination with a furnace, a seal consisting of two or more leaves, connections
10 between said leaves so that they will each move simultaneously an equal distance from the center of the furnace, said leaves being arranged to be opened by the weight of the
15 stock falling upon them, substantially as described.

3. In combination with a furnace, a seal consisting of two or more leaves, connections
20 between said leaves so that they will each move simultaneously an equal distance from the center of the furnace, said leaves being arranged to be opened by the weight of the stock falling upon them and closed by a counterweight, substantially as described.

4. In combination with a furnace and its bell, a seal consisting of two or more leaves
25 suitably geared together outside of the furnace, said leaves adapted to receive the stock and distribute it equally over the center of the bell of the furnace, substantially as described.

5. The combination with a furnace and its hopper and bell, of a seal consisting of two or more leaves suitably geared together outside of the furnace, said leaves adapted to
30 receive the stock and distribute it equally over the center of the bell, and means for automatically closing said leaves after the stock has passed into the hopper, substantially as described.

In testimony whereof I have signed my
40 hand to this specification in the presence of two subscribing witnesses.

GEORGE W. BOLLMAN.

Witnesses:

FRED J. GALLOWAY,
W. B. FOSTER.