

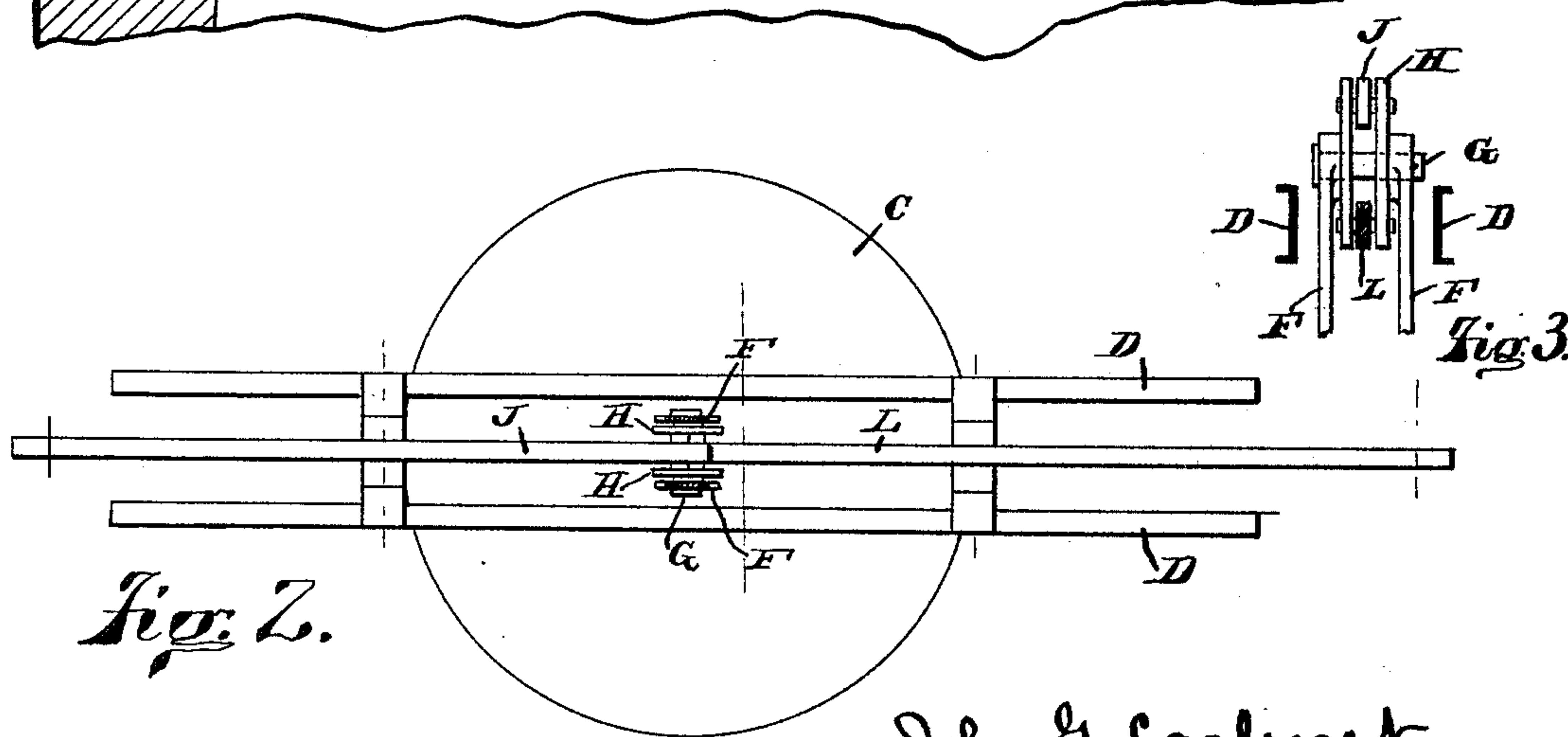
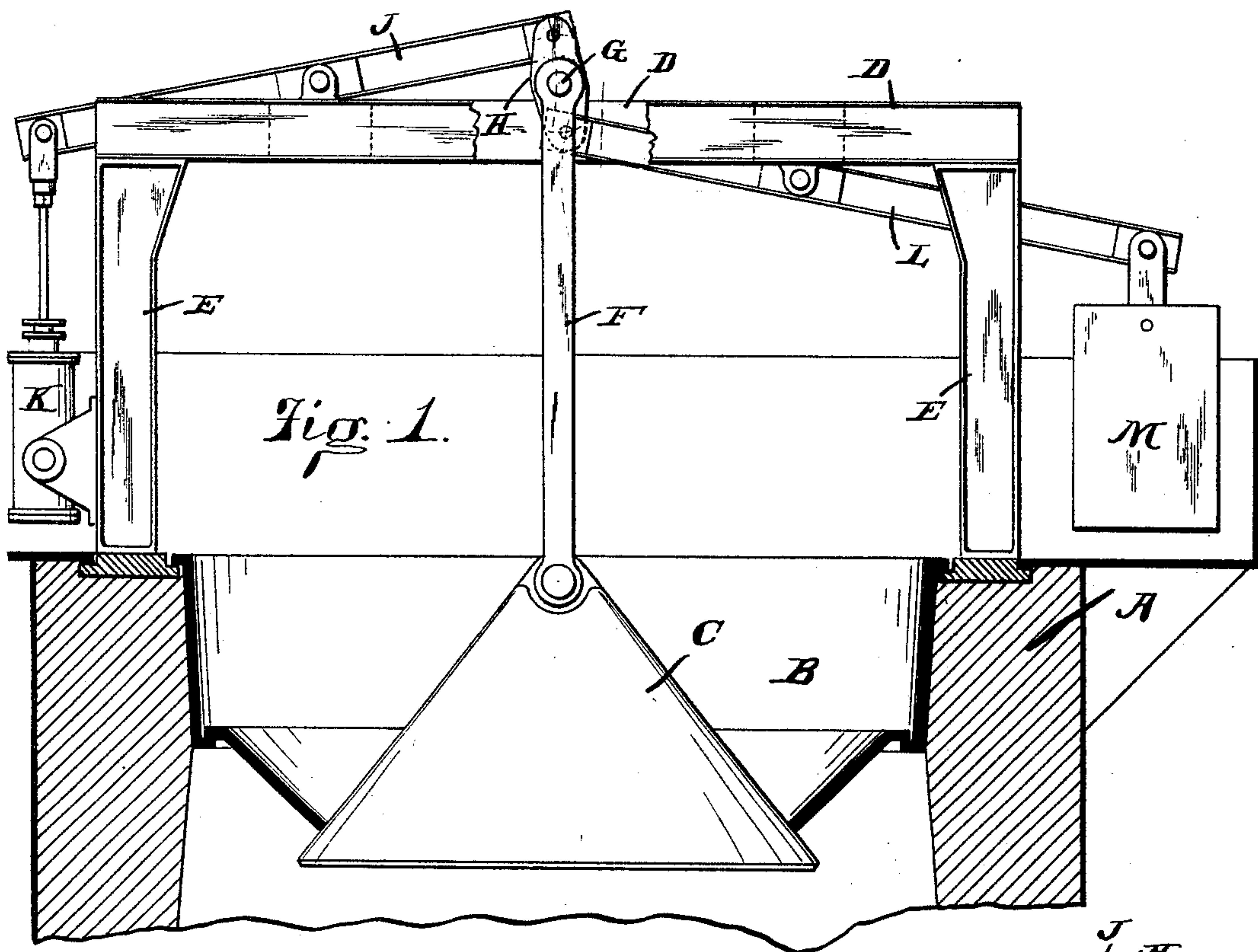
(No Model.)

J. G. CARLINET.

## HOPPER MECHANISM FOR BLAST FURNACES.

No. 414,019.

Patented Oct. 29, 1889.



John G. Carlinet

Inventor

Witnesses  
Wadsworth  
C.A. Fisher.

By his Attorney

James W. See

# UNITED STATES PATENT OFFICE.

JOHN G. CARLINET, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO GORDON, STROBEL & LAUREAU, (LIMITED,) OF SAME PLACE.

## HOPPER MECHANISM FOR BLAST-FURNACES.

SPECIFICATION forming part of Letters Patent No. 414,019, dated October 29, 1889.

Application filed June 6, 1888. Serial No. 276,226. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN G. CARLINET, of Philadelphia, Pennsylvania, and a subject of the King of Italy, have invented certain new and useful Improvements in Bell and Hopper Mechanism for Blast-Furnaces, of which the following is a specification.

This invention pertains to mechanism employed in raising and lowering the bell at the top of a blast-furnace.

The improvement will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of the bell-supporting structure at the top of a blast-furnace embodying my improvements, the hopper and furnace-wall appearing in vertical diametrical section, while a portion of one of the arch-beams is broken away to exhibit more clearly the construction between the beams; Fig. 2, a plan of the same, and Fig. 3 a vertical transverse section.

In the drawings, A indicates the wall at the mouth of the furnace; B, the hopper; C, the bell; D, two beams disposed alongside each other over the top of the furnace; E, columns resting upon the top walls and supporting these beams; F, the bell-rod, illustrated as formed of two flat bars disposed side by side, their lower ends being pivoted to the apex of the bell and their upper ends projecting between the top beams D; G, a horizontal pivot at the top of the bell-rod; H, a connecting-link, shown as formed of two bars, this link centrally pivoted to the pivot G and disposed between the two bars forming the bell-rod and substantially vertical when the bell is up; J, the motor-beam, fulcrumed upon a pivot carried by the top beams and disposed between the two top beams, the inner end of this beam passing between the two bars forming the connecting-link H and pivoted thereto; K, a motor-cylinder, by

means of which the motor-beam is oscillated when the bell is to be raised and lowered, the piston-rod of this cylinder being connected to the outer end of the motor-beam, this motor-cylinder being intended in the illustration to simply typify well-known motor apparatus; L, the counterbalance-beam, similar to the motor-beam and similarly pivoted to the opposite end of the lever H and similarly fulcrumed to the top beams D, the fulcrum, however, being located below the plane of the pivot of the motor-beam; and M, the counterbalance-weight suspended upon the outer end of the counterbalance-beam.

The bell is raised and lowered in the usual manner, the inner end pivot of the motor-beam describing during the motion the arc of a circle, the counterbalance-beam at the same time operating similarly, the oscillations of the lever H causing the bell-rod and the bell to move in a truly-vertical line, whereby an even distribution of the stock in the furnace is caused.

I claim as my invention—

In a blast-furnace bell and hopper mechanism, the combination, substantially as set forth, of a bell-rod connected with the apex of the bell, a horizontal pivot at the upper end of the bell-rod, a link pivoted at its center to said pivot and disposed substantially vertically when the bell and bell-rod are up, a centrally-pivoted motor-beam, a motor mechanism arranged to apply force to the outer end of said beam, a counterbalance-beam with its pivot out of the plane of the pivot of the motor-beam, a counter-balance arranged to apply force to the outer end of said beam, and pivots uniting the inner ends of said two beams with the ends of said link.

JOHN G. CARLINET.

Witnesses:

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