

(No Model.)

2 Sheets—Sheet 1.

F. J. FIRTH.
GRAIN ELEVATOR.

No. 258,044.

Patented May 16, 1882.

FIG. 1.

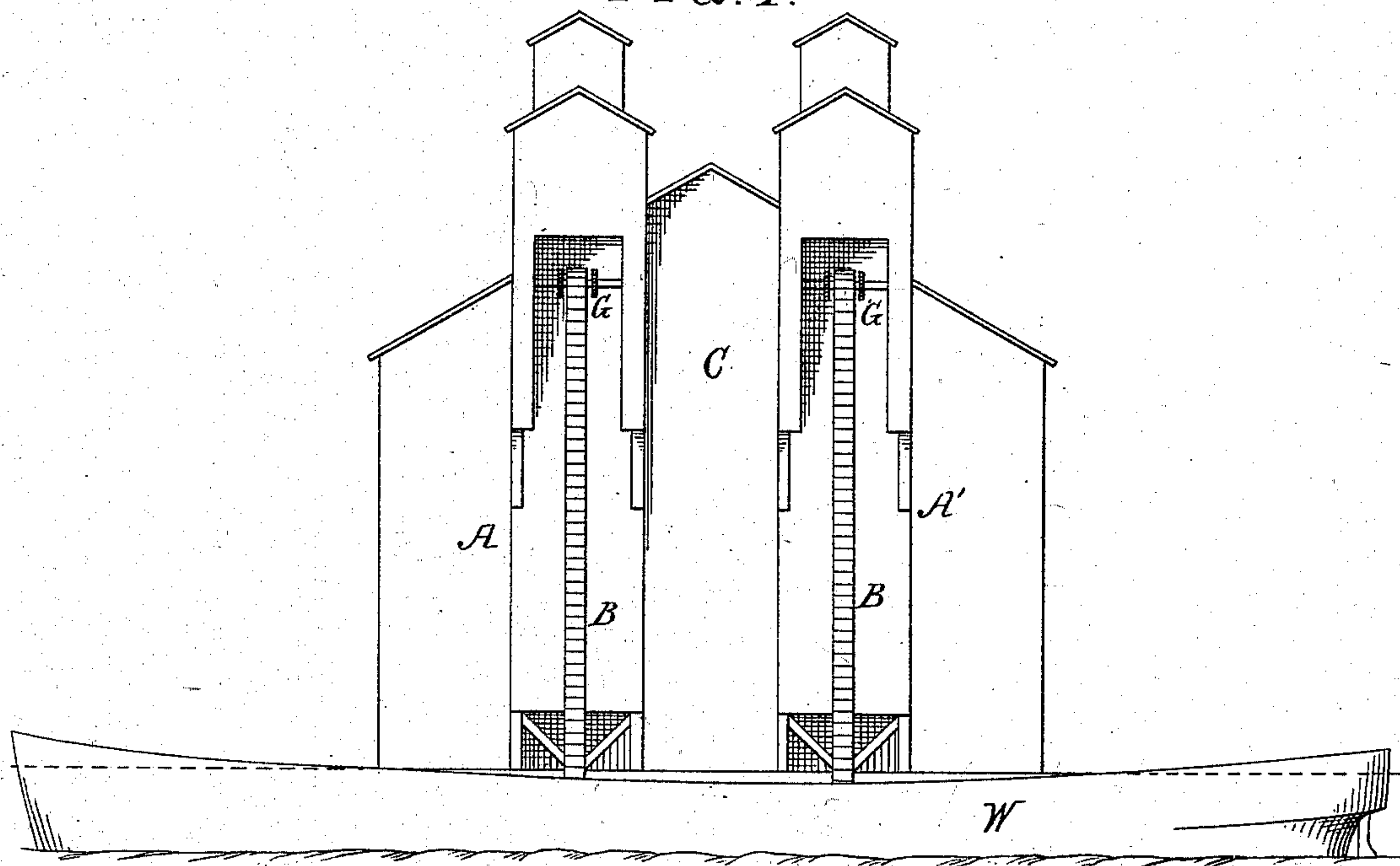


FIG. 3.

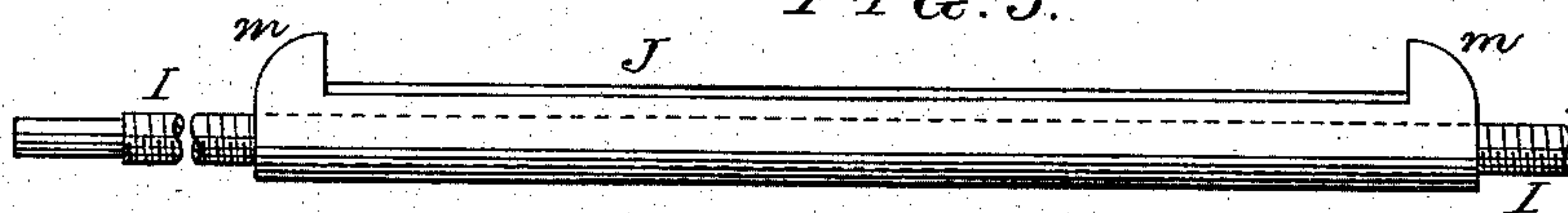


FIG. 4.

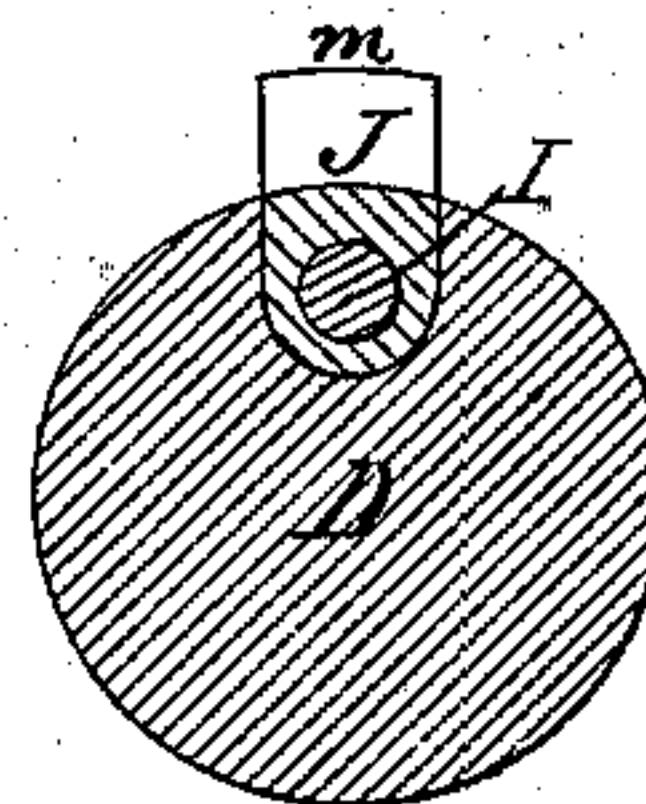
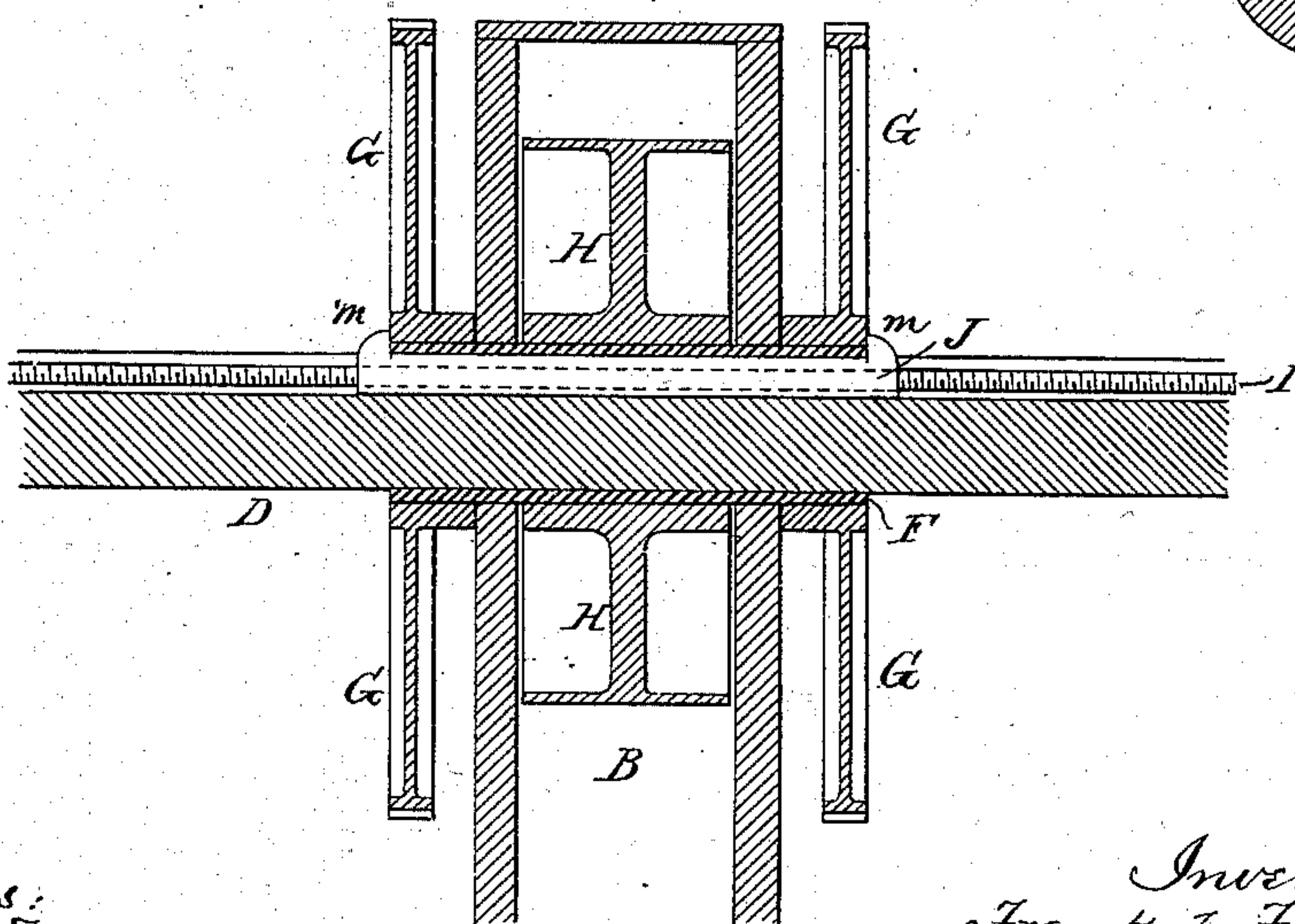


FIG. 2.



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by his Attorneys
Howson and Fox

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2 Sheets—Sheet 2.

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FIG. 8.

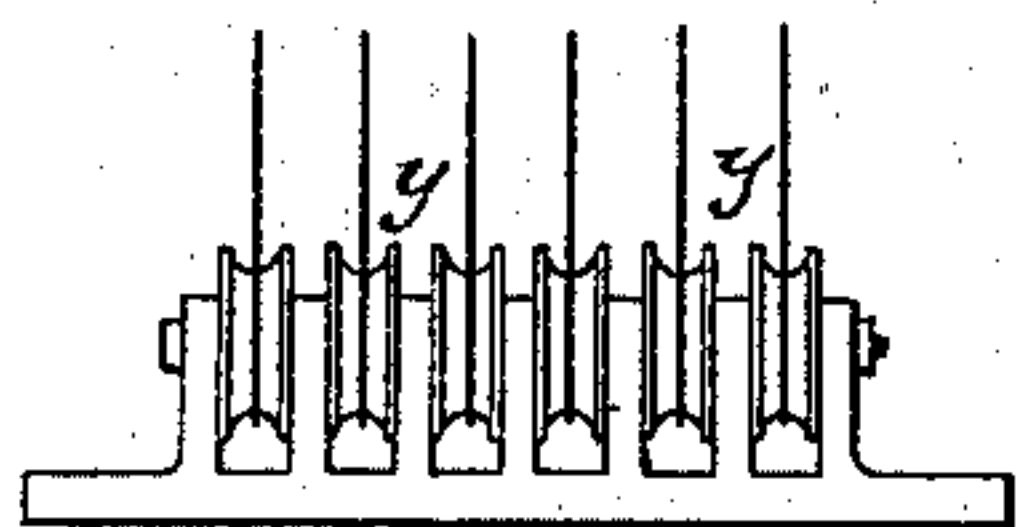


FIG. 5.

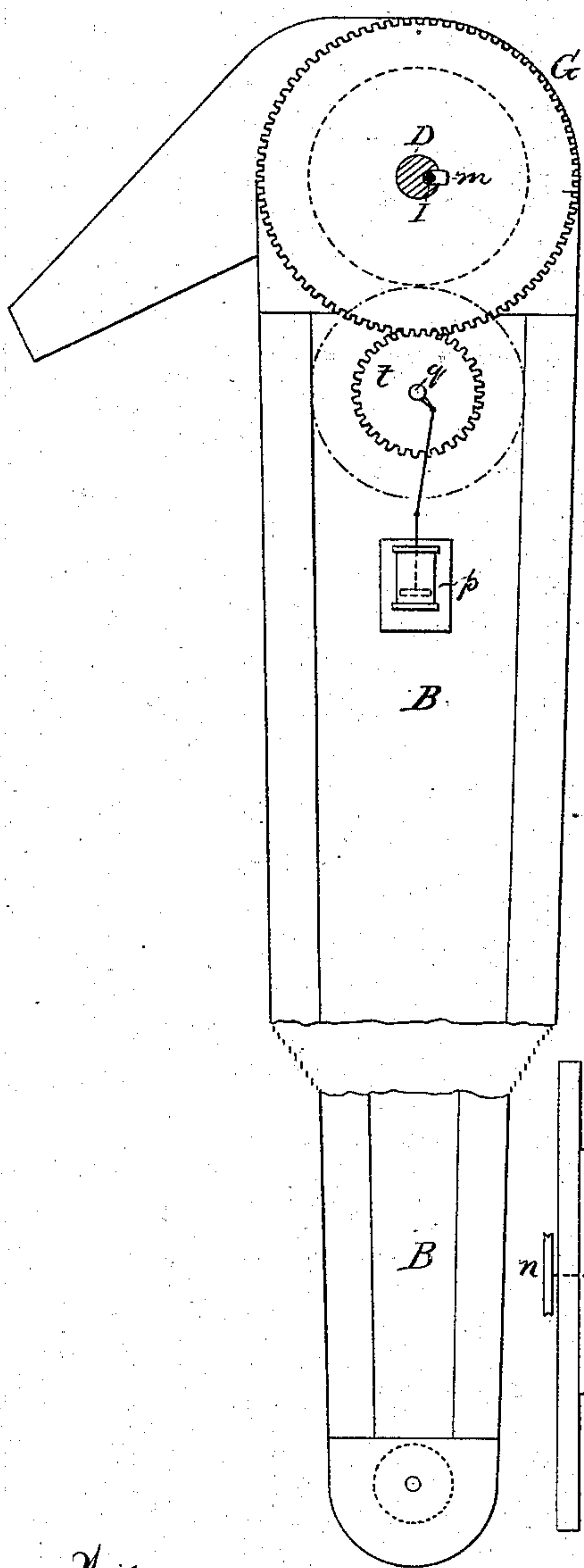


FIG. 6.

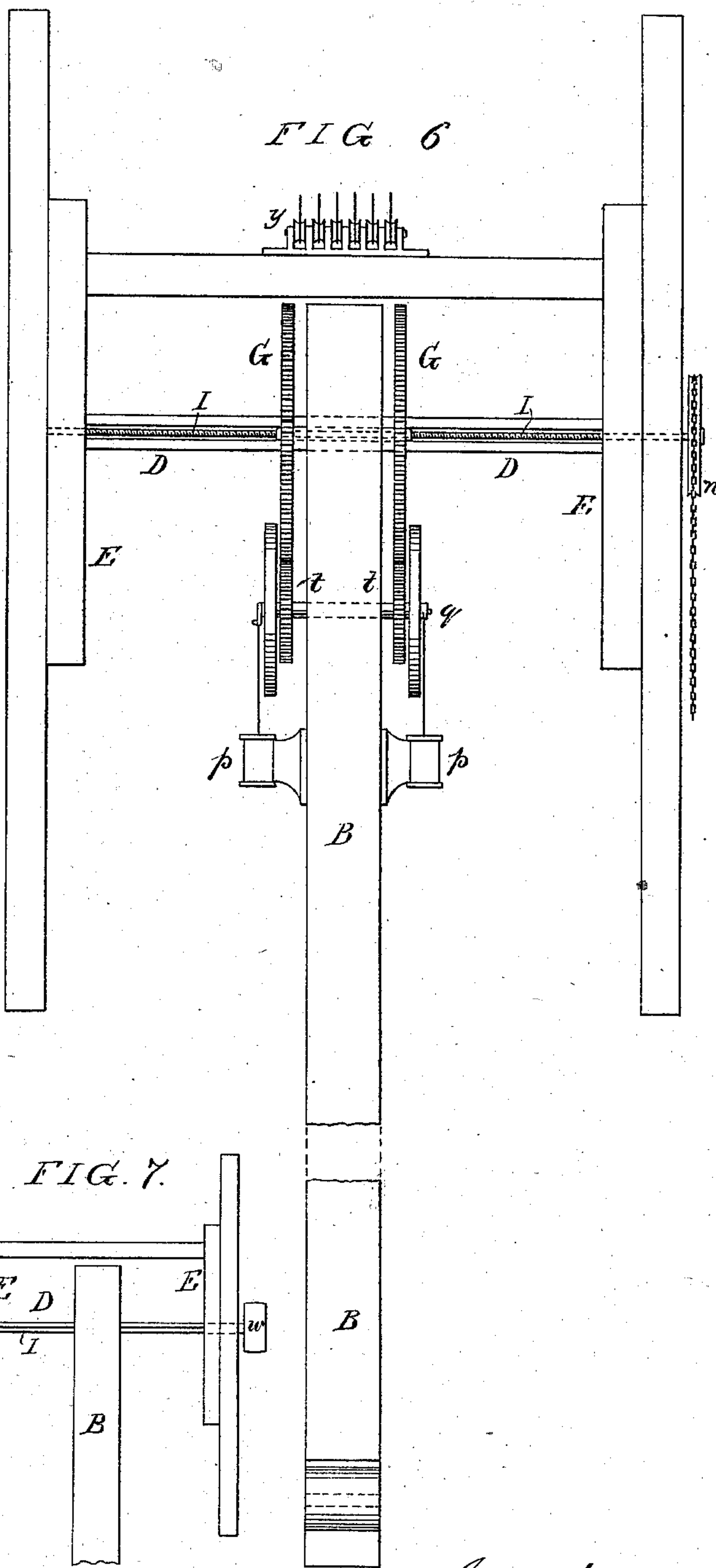
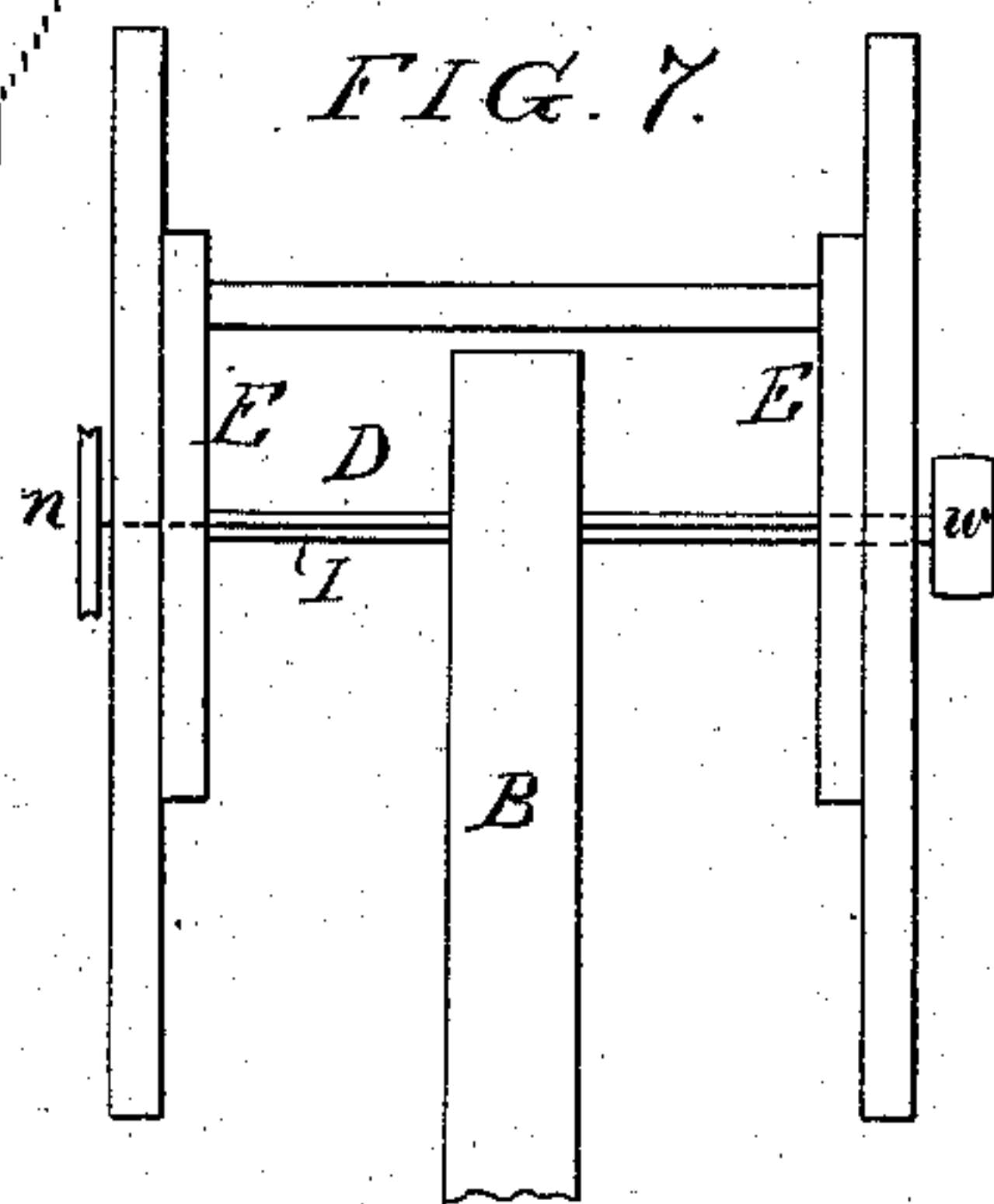


FIG. 7.



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UNITED STATES PATENT OFFICE.

FRANK J. FIRTH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
ERIE AND WESTERN TRANSPORTATION COMPANY, OF SAME PLACE.

GRAIN-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 258,044, dated May 16, 1882.

Application filed April 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. FIRTH, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Grain-Elevators, of which the following is a specification.

The main object of my improvement in grain-elevators is to afford facilities for rapidly unloading vessels, and this object I attain by combining with a main building or store-house two towers or elevator structures, the leg of one or each of the towers being movable laterally, so as to facilitate the adjustment of the said legs to the hatches of the vessel to be unloaded and permit both elevators to be promptly put in action at the same time.

In the accompanying drawings, Figure 1, Sheet 1, is a front view of two elevator-towers the legs of which have been adjusted to two hatchways of a vessel, W; Fig. 2, an enlarged sectional view of mechanism which may be used for the lateral adjustment of the elevator-leg; Figs. 3 and 4, views drawn to a still larger scale and representing the detailed construction of the adjusting mechanism; Fig. 5, Sheet 2, a side view of parts of the elevator-leg and driving appliances connected therewith; Fig. 6, a front view of Fig. 5; Fig. 7, a view illustrating modified adjusting mechanism, and Fig. 8 an enlarged view of part of the elevator-leg.

There are two permanent elevator structures or towers, A A', erected on a wharf, and combined with the main building C at the rear, containing the usual bins, &c. To each of the structures A A' is hung an elevator-leg, B, containing the usual endless belt and its buckets, and provided with the usual discharge-spout. It has not been deemed necessary to illustrate or describe the detailed construction of the elevator-leg, as it may be essentially similar to the legs of ordinary grain-elevators, each leg being hung to a vertically-adjustable frame, so that it can be moved inward or outward and its lower end introduced through a hatchway into the hold of a vessel. The legs of the two elevators are so connected to the permanent towers that they can be readily adjusted laterally to the hatchways of the vessels to be unloaded, for the distance apart of these hatch-

ways differs materially in different vessels; and it is important that there should be no serious delay in setting the two elevators to work after the vessel to be unloaded has been moored in front of the structure.

I will now describe mechanism by which this adjustment of the elevator-legs may be effected.

A fixed shaft, D, is connected to and forms a part of a frame, E, which is vertically adjustable in the tower of each elevator, the frame E being furnished at the top with a system of pulleys, y, as usual, for receiving a rope or chain, through the medium of which the frame and the leg hung thereto can be raised and lowered by a steam-engine in the main building.

The upper end of the leg B, Fig. 2, is hung loosely to the tubular shaft F, which is adapted to turn on the shaft D, and to the tubular shaft are secured two cog-wheels, G G, as is also the pulley H, round which the endless belt carrying the buckets passes, this pulley being, as usual, contained within the leg. The fixed shaft D has a longitudinal groove, to which is adapted a bar, J, having at each end a lug, m, the bar being such as not to interfere with the free rotation of the tubular shaft F. A screw-shaft, I, is also contained within the groove of the shaft D, and passes longitudinally through the bar J, the internally-threaded interior of which is adapted to the thread of the screw-shaft, the latter having its bearings in the vertically-adjustable frame E, and having a pulley, n, round which passes an endless chain, so that by manipulating the latter the screw may be rotated, and the leg and attachments thereto may be moved along the fixed shaft D in either direction. The leg carries a steam-engine, or, by preference, two small steam-engines, of which p p are the cylinders, steam being admitted to the valve-chests through a flexible or jointed pipe communicating with a steam-boiler in the main building or store-house C.

The pistons of the cylinders are connected to cranks on the shaft q, which has its bearings in the leg B, and which has pinions t t gearing into the wheels G G on the tubular shaft, so that when the engines are in opera-

tion the tubular shaft F will be rotated and the endless belt with its buckets traversed in the usual manner.

It is not essential that the mechanism illustrated in Figs. 2 to 5, inclusive, should be used in carrying out my invention—that is, the lateral adjustment of the leg within the tower—for other appliances for this purpose will readily suggest themselves to skilled artisans; nor is it essential that the leg of the elevator should carry the steam-engine by which the endless bucket-carrying belt is traversed. In Fig. 7, for instance, the shaft D, instead of being fixed in the adjustable frame, is arranged to be rotated in bearings thereon, and is driven by a steam-engine in the main building, a belt from the engine-pulley passing round a pulley, w, the pulley for the endless belt turning with the shaft, but admitting of being moved thereon, and the leg being moved laterally with the belt-pulley by a screw-shaft or other device when a lateral adjustment of the said leg is required.

There may be combined with the main building a single elevator structure or tower with

a laterally-adjustable leg where wharf-frontage is limited by excessive cost or otherwise; but the combination of two or more than two towers with the main structure is advisable, as it permits the unloading of the vessel more speedily than when but a single tower is employed.

I claim as my invention—

1. The combination of a fixed elevator structure or tower, A, an elevator-leg, B, hung to a vertically-adjustable frame in the said tower, and mechanism whereby the said leg may be adjusted laterally, all substantially as set forth.

2. The combination of the main building C, two or more elevator structures or towers, A A', and a laterally-adjustable elevator-leg in one or more of the towers, substantially as specified.

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

FRANK J. FIRTH.

Witnesses:

HARRY DRURY,
HARRY SMITH.