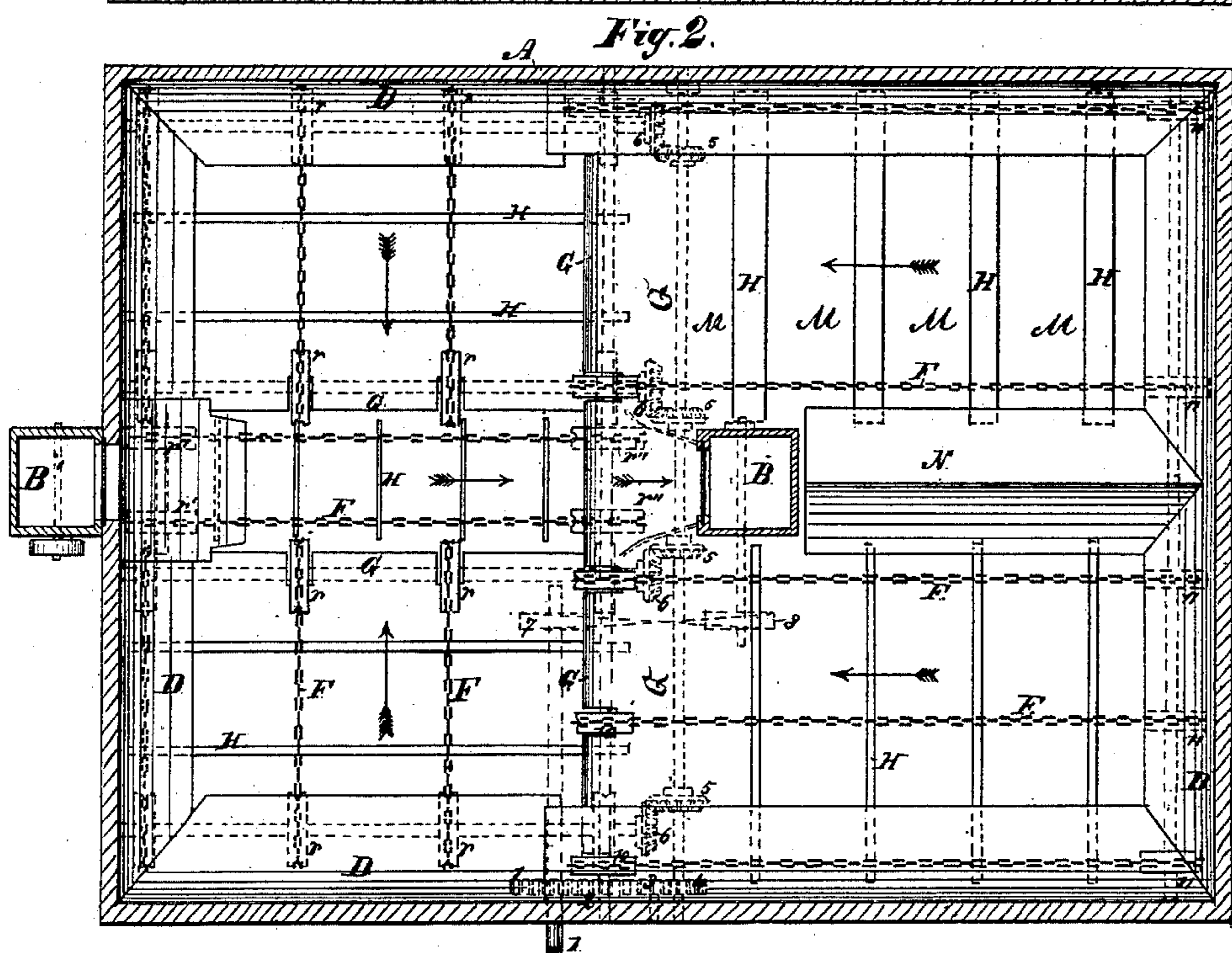
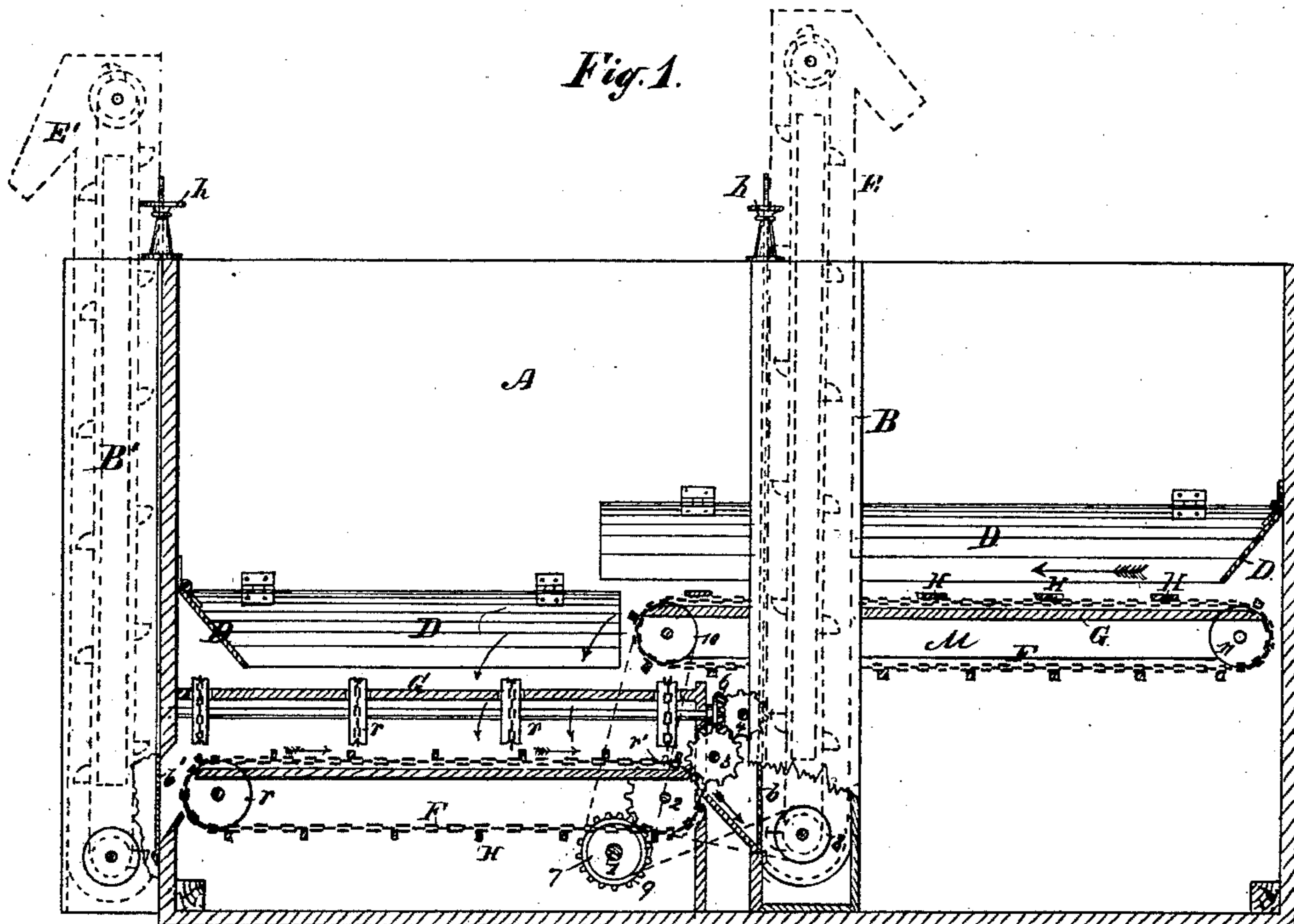


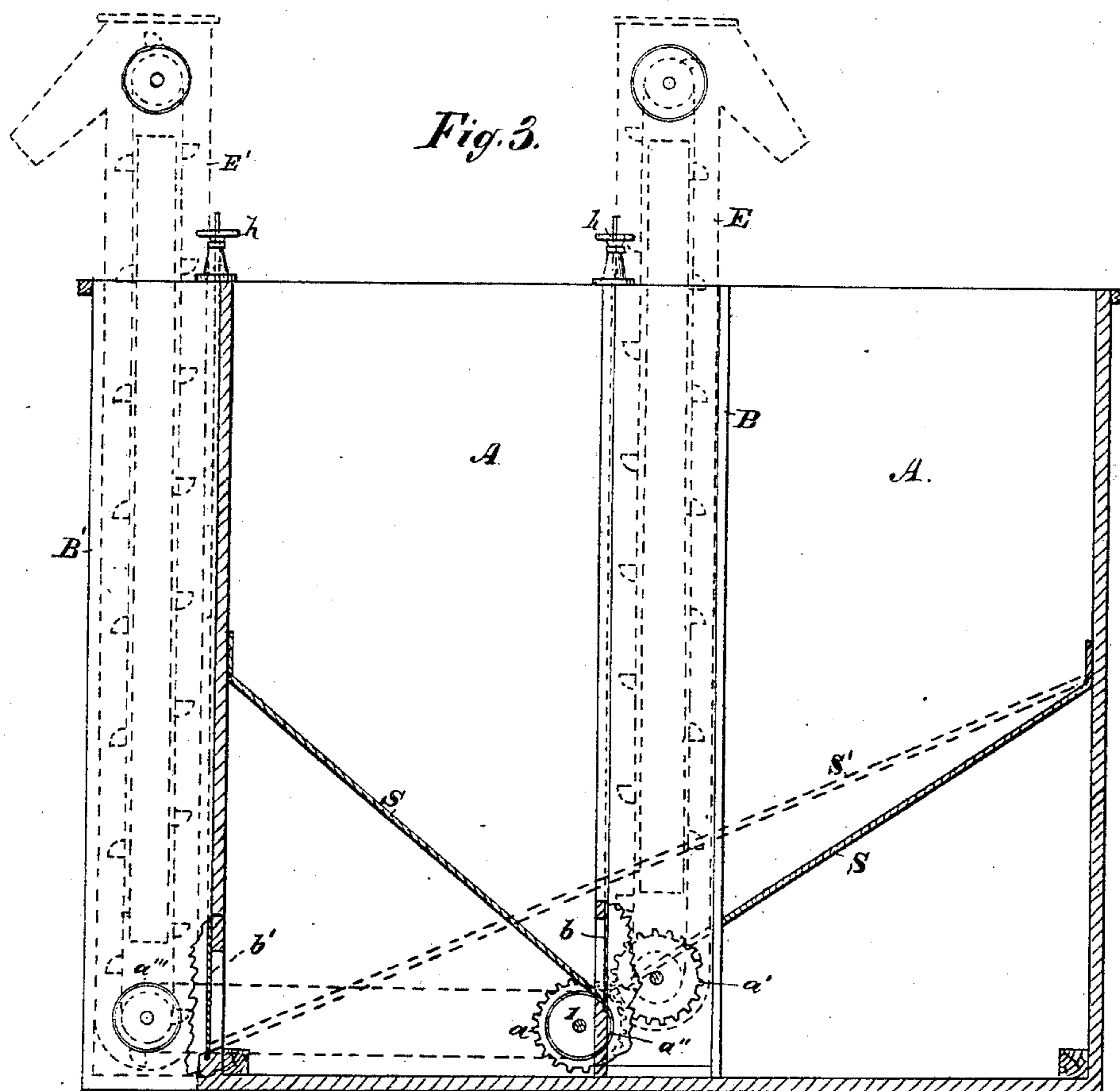
F. IMHORST.  
Machine for Unloading Vessels.  
No. 223,350. Patented Jan. 6, 1880.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

FERDINAND IMHORST, OF BALTIMORE, MARYLAND.

## MACHINE FOR UNLOADING VESSELS.

SPECIFICATION forming part of Letters Patent No. 223,350, dated January 6, 1880.

Application filed December 5, 1879.

*To all whom it may concern :*

Be it known that I, FERDINAND IMHORST, of the county and city of Baltimore, State of Maryland, have invented new and useful Improvements for Moving Articles in Bulk, such as grain, ores, coal, &c., toward desirable localities, of which the following is a specification.

My improvements are directed toward feeding elevators by means of machinery; and this machinery consists, partly, of a combination of slides or slanting boards of various dimensions and pitch, but whose lowest points combine near the gate of a box, or of the elevator proper, which is attached to the box, bin, house, or compartment of a vessel, for the purposes of raising the mass by means of the elevator-buckets when the gate is opened, the floor being made of such a combination of inclines as is found in a hopper. The lowest points are directed toward the elevator. The whole mass within the space will, by its own weight, move toward its lowest points and be removed by the elevator.

The second feature of my invention is also directed toward moving merchandise in bulk toward the elevators by means of a combination of slides with a combination of endless chains, iron cross-bars, and flexible belts lined with chains and combined crosswise with metal bars. This combination of belts, chains, and bars is to be set in motion by various shaftings, cog-wheels, and pulleys constructed expressly for that purpose, and to be worked either by the machinery of a vessel or by an engine constructed expressly for that purpose.

The third feature of my invention is directed toward providing a belt strong enough to be pulled through a heavy mass of ores or coal or grain without being torn to pieces by the machinery and the heavy weights resting upon it. Therefore I have constructed a belt of heavy iron chains and connected same at intervals with iron cross-bars to push the mass ahead.

Figure 1 shows a vertical longitudinal section of a box, bin, house, or compartment of a vessel, with belts, chains, cross-bars, and slides, boxes, and elevators with gates and machinery. Fig. 2 shows a horizontal section and plan of the same. Fig. 3 shows a vertical longitudinal section of a box, bin, house,

or compartment of a vessel of which the floor is constructed, forming a combination of slides, the lowest points of the slides meeting near the elevator, thereby forming a bottom or floor such as is found in a hopper.

In the several figures shaftings and wheels are shown, by means of which the beltings, chains with bars, and the elevators also, are set in motion.

A shows the sides of a box, bin, house, or compartment of a vessel to be filled with the merchandise in bulk, such as grain, ores, coal, &c. B shows a box protecting the elevator-buckets from the pressure of the surrounding mass. *b* shows a gate used for the purpose of admitting the mass to the buckets of the elevator E; then, by raising the gates *b* by means of wheel and shaft *h*, the mass to be moved may be taken up by the buckets of the elevator E.

A continual supply of the mass is obtained by revolving the shaftings and wheels, as shown by devices numbered 1 2 3 4 5 6 7 8 9 10 11. These operate then upon the wheels and shaftings *r r* and endless chains F, with connecting cross-bars H. The mass to be moved is carried by these chains and the superimposed pieces in the direction of the several arrow-heads until it reaches the elevator E. When merchandise of small particles, such as grain, coal-dust, &c., has to be moved, it is preferable to use closed belts made of canvas or other flexible material, and strengthened with chains and cross-bars fastened firmly to the canvas by means of rings, bolts, and rivets, thereby forming a tight belting of great strength and durability. In Figs. 1, 2, the letters M M show such a flexible belting in combination with chains F and cross-bars H.

D shows the slides or slanting boards as fastened securely to the sides of the box, bin, house, or compartment of a vessel, for the purposes of depositing all articles within its reach upon the belts below.

N shows double slides or roof, for the purpose of preventing the mass from accumulating behind the box B, and serves to precipitate the merchandise onto the belts running on each side. The slides, in combination with the various belts, are arranged in such a manner, by having the belts run at an angle to-

ward each other, that not a particle of the mass will remain at rest when the whole machinery is set in motion.

G shows the extra flooring required to prevent the mass from dropping through the belt-ings to the space underneath.

In Fig. 3 the floor S S within the box, bin, house, or compartment of a vessel is raised to such a pitch that the mass placed upon it will slide by its own weight toward the box B and elevator E, and will enter through the gate *b* when same is raised by wheel and rod *h*, and the parts of the mass within the reach of the elevator-buckets will be hoisted.

Q Q show the main shaft, by which the whole machinery for feeding elevators, and also the elevator itself, are set in motion.

What I claim is—

1. In combination with a box, bin, house, or compartment of a vessel, A, the sloping floor or bottom S S, and whose lower points meet near the elevator E, the box B, and gate *b*, constructed in the manner and for the purposes substantially as described.

2. In combination with a box, bin, house, or compartment of a vessel, the endless chains F, with connecting cross-bars H, and sliding boards, as D and N, arranged in the manner and for the purposes substantially as described.

3. The endless chains F, with cross-bars H, in combination with flexible belt M, arranged in the manner and for the purposes substantially as described.

4. The combination of chains and cross-bars shown by F and H, forming an endless belt, arranged in the manner and for the purposes substantially as described.

5. The combination of the shaft and pulley Q and *r* with beltings M, chains F, bars H, slides D and N, box B, with elevator E and gate *b*, all within a box, bin, house, or compartment of a vessel, arranged in the manner and for the purposes substantially as described.

6. In combination with a box, bin, house, or compartment of a vessel, two or more endless belts moving at an angle toward each other, and operating in such a manner that articles placed at a point controlled by either of such belts will be carried finally toward the elevator E, arranged in the manner and for the purposes substantially as described.

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Witnesses:

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