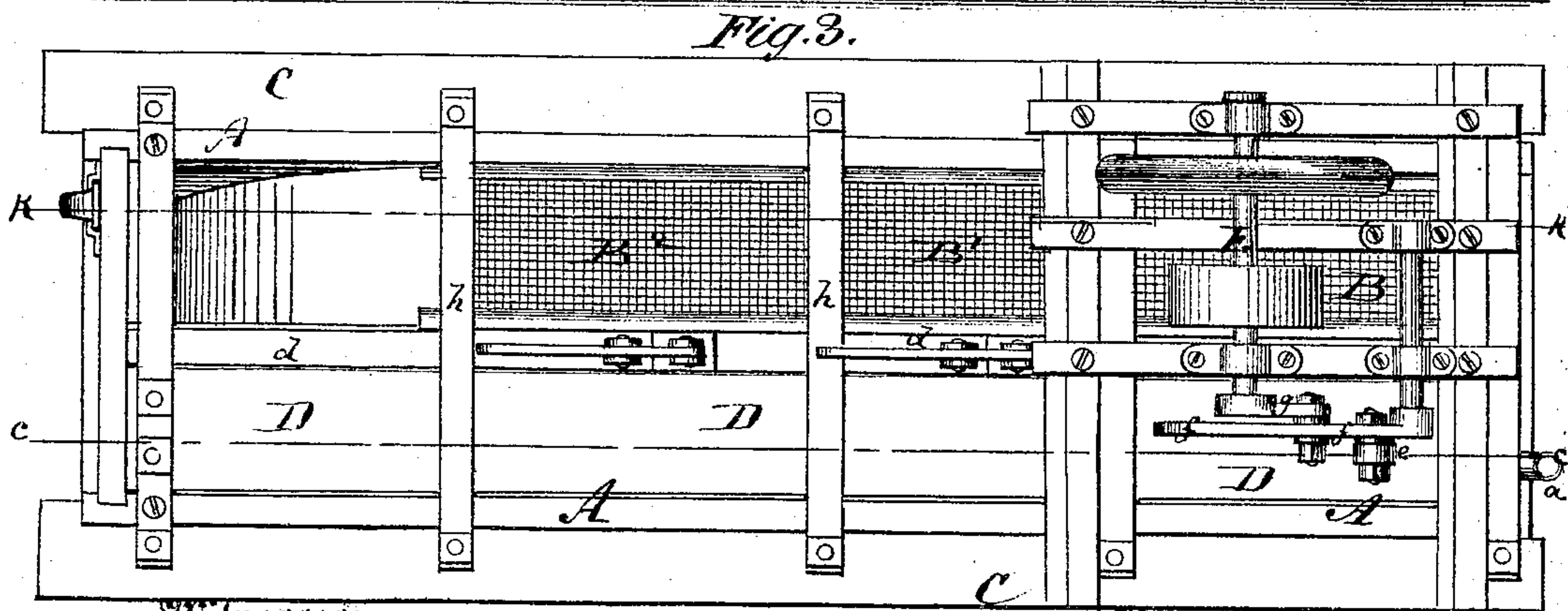
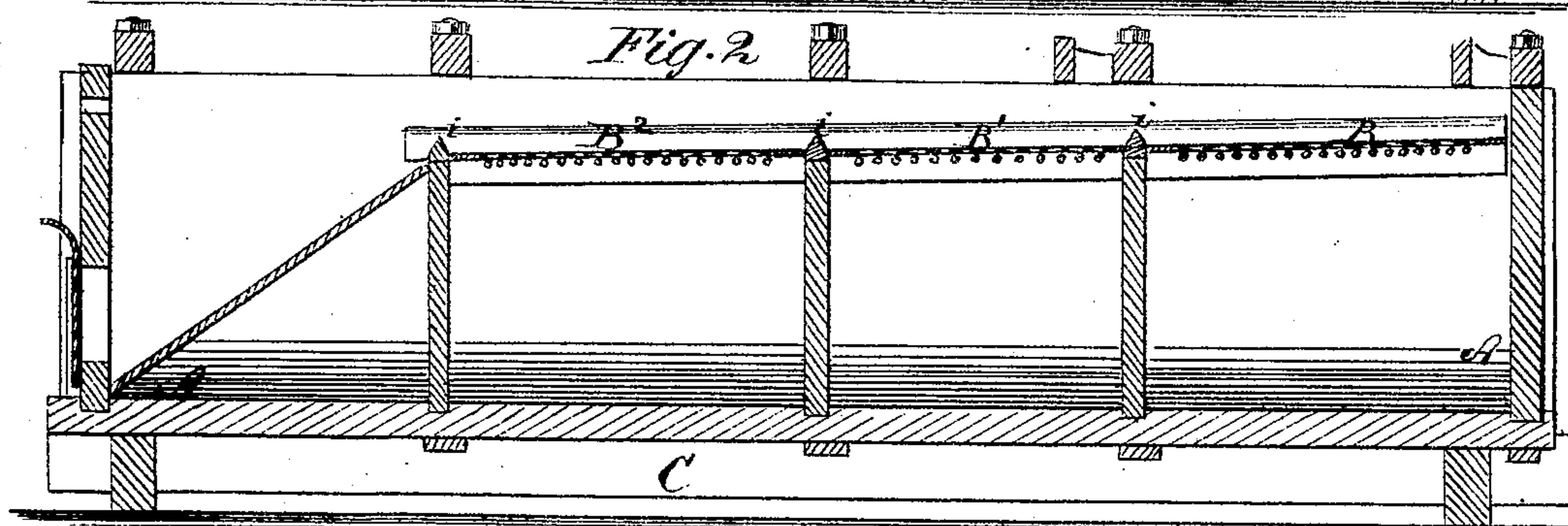
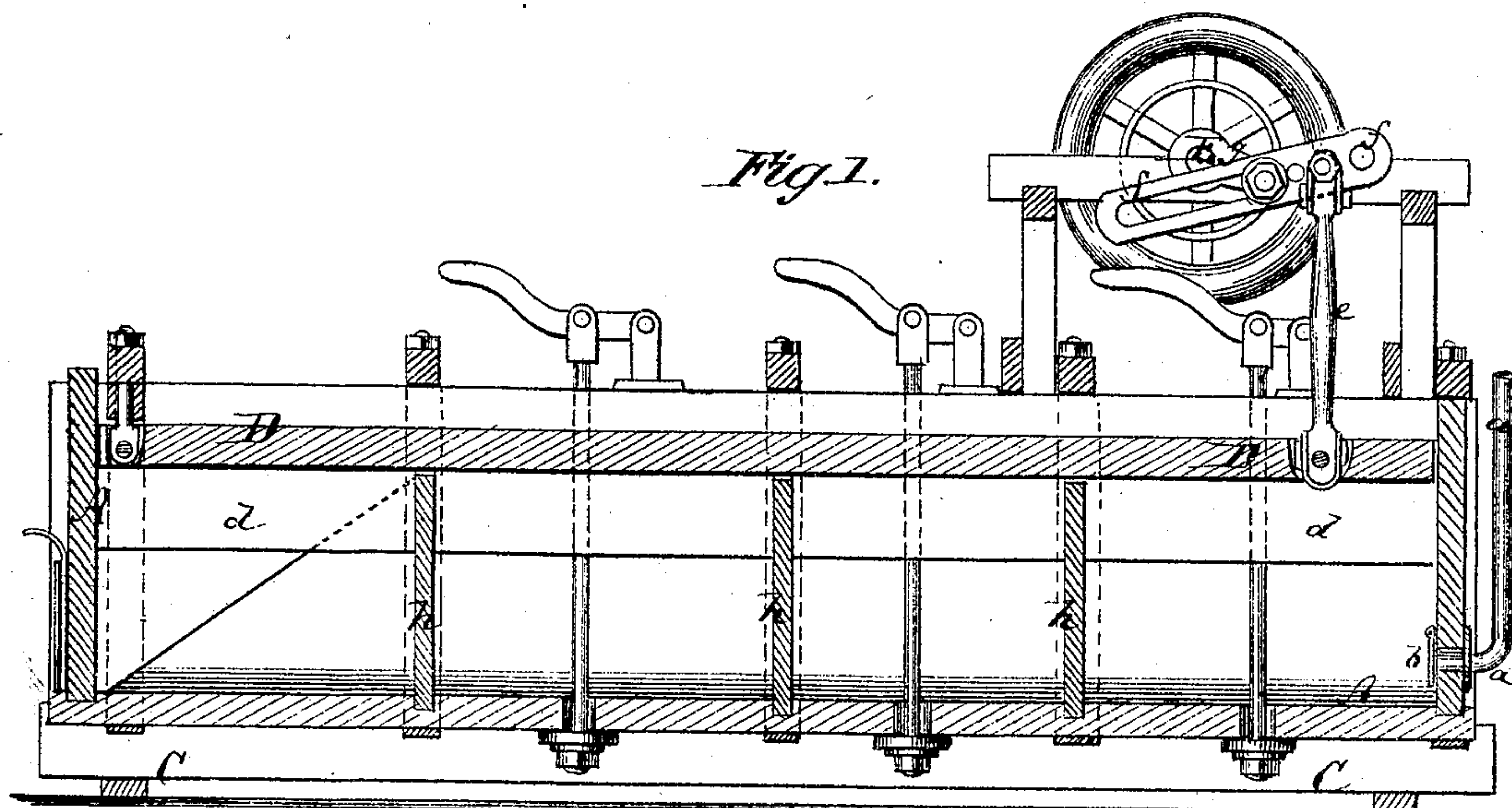
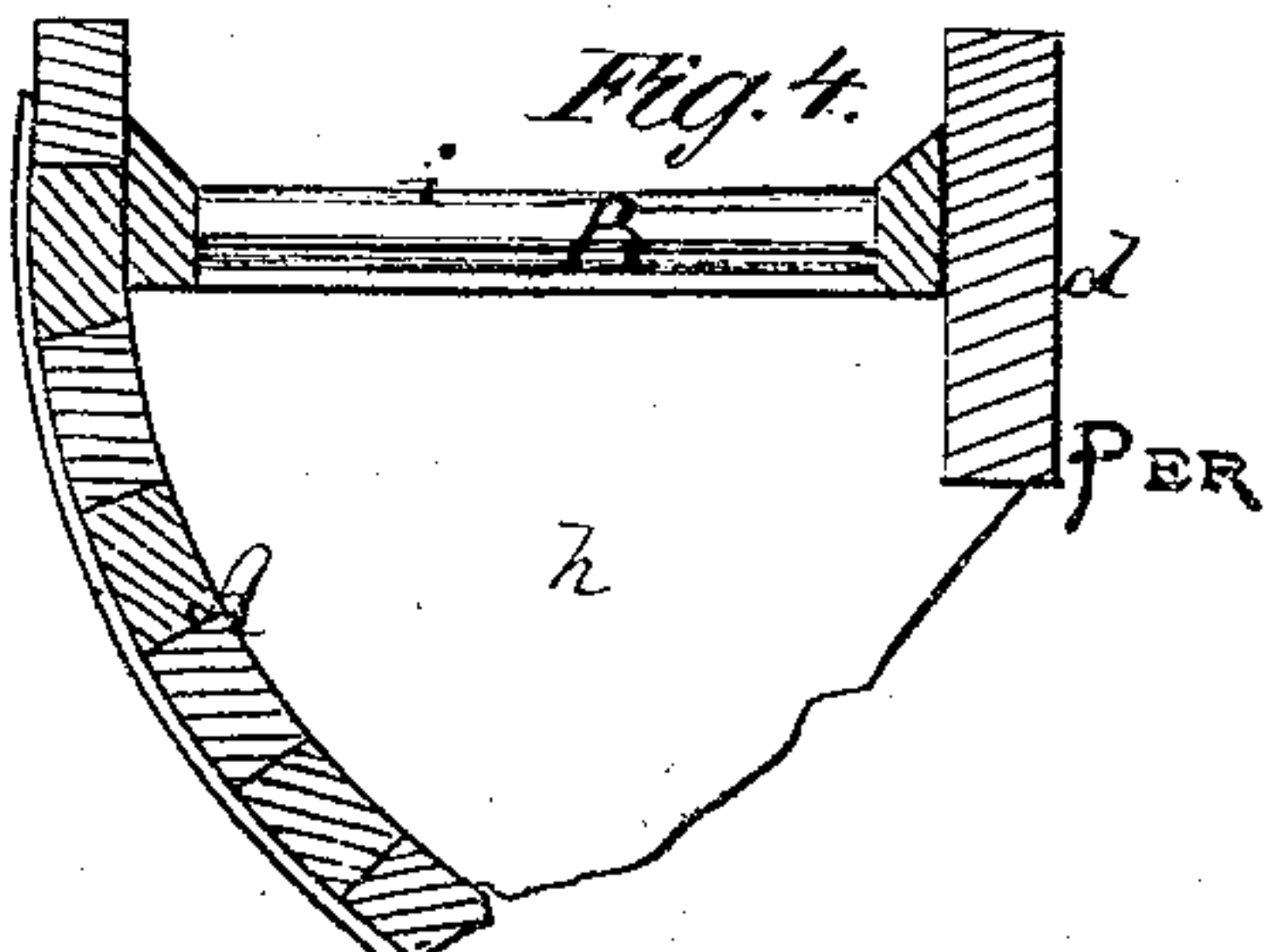


F. CAZIN.
Improvement in Ore-Separators.
No. 128,536.

Patented July 2, 1872.



Witnesses:
John Becker.
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UNITED STATES PATENT OFFICE.

FREDERIK CAZIN, OF FRUMET, MISSOURI.

IMPROVEMENT IN ORE-SEPARATORS.

Specification forming part of Letters Patent No. 128,536, dated July 2, 1872.

Specification describing a new and useful Improvement in Ore-Separators, invented by FREDERIK CAZIN, of Frumet, Jefferson county, Missouri.

Figures 1 and 2 are vertical longitudinal sections of my improved ore-separator taken, respectively, on the lines C C and K K, Fig. 3, which is a top view of the same; Fig. 4 being a partial transverse section.

Similar letters of reference indicate corresponding parts.

This invention relates to improvements in the arrangement of the actuating plunger-sieve and operating mechanism of an apparatus for separating crushed and screened mineral rock, according to the specific gravity—*i. e.*, separating the several kinds of pure ore from the waste rock.

The invention consists in a plunger arranged parallel to a row of sieves and pivoted at one end, so that the force or effect of its stroke upon the water shall be gradually increased thence to its free end. It also consists in the arrangement of a slotted arm with the wrist-pin of the driving-shaft and the rod that connects with the plunger, so that the down stroke of the plunger shall be quicker than its up stroke.

A in the drawing represents the trough or vessel on which the sieves B B¹ B², for effecting the separation, are arranged. The vessel is of suitable length, preferably with nearly semi-cylindrical bottom, and is stationary, secured on a supporting-frame, C. At the ends the vessel is closed, except that the water-supply pipe *a* enters one end. An inwardly-opening valve, *b*, shuts the end of the pipe *a*. The upper part of the trough A contains a longitudinal partition, *d*, which, however, does not reach down to the bottom, serving merely to separate the plunger D on one side from the sieves on the other. The plunger is a flat board or plate, pivoted at one end to the vessel, while its other end is, by a pitman, *e*, connected with a slotted lever, *f*, in the slot of which the wrist-pin of a crank, *g*, on the operating-shaft E works. The plunger is thereby vibrated up and down. Whenever it moves up it sucks the water in through the pipe *a* and draws it down through the sieves. Whenever it is coming down it shuts the

valve *b* and forces the water in the trough up through the sieves. The latter motion should be quicker than the former, for which object the wrist-pin of the crank *g* is nearer the pivot of the lever *f* when swinging the same down, and further away from the pivot when swinging it up. Transversely the trough has a partition, *h*, between every pair of sieves, and also at the end of the last sieve B². These partitions absolutely subdivide the trough into separate chambers for the collection of the several kinds or grades of ore, each partition being only sufficiently recessed on top to permit the necessary vibrations of the plunger. The motion of the plunger being greatest near its connection with the shaft E a larger amount of water will be forced through the first sieve than through the next, and so forth; but the plunger-space, corresponding to the very last sieve B², is made so much longer than its predecessor that the last sieve will receive more water than the latter. The portion of the plunger working for all sieves but the last sieve, being of equal length with each sieve, causes the proportion of water supplied to be regulated by the several lengths of sieves as well as by the adequate lift of the plunger.

By thus regulating, by the lengths of sieves, the duration of the passage of the ore over them, and the amount of water supplied to each, the apparatus is specially adapted to such ores containing several valuable ingredients, where the last sieve is to let through more matter of a less specific gravity than the other sieves.

The bridges *i i* between the sieves are V-shaped—that is, sharp-ridged—to offer as little resistance as possible.

I wish to call special attention to the importance and advantage of the single plunger, vibrating as described.

By the inflowing supply-water, which has its outlet from below and through the sieves, the down motion of the water and suspended ore, after their receiving the up-lift by the descent of the plunger, is partly arrested, and the separation of particles according to their specific gravity thereby greatly facilitated. By the constant stream of clear water from under the sieves all deposition of refuse material on the latter is prevented.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The plunger D, arranged parallel to a row of sieves, and pivoted at one end within the case A, as shown and described, so that the force or effect of its stroke may be gradually increased from one end to the other, as and for the purpose specified.

2. The slotted lever *f*, pivoted at one end,

and connected with the rod *e* of the plunger and crank *g* of the driving-shaft, as shown and described, whereby the down motion of said plunger is made quicker than its up stroke, as and for the purpose specified.

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