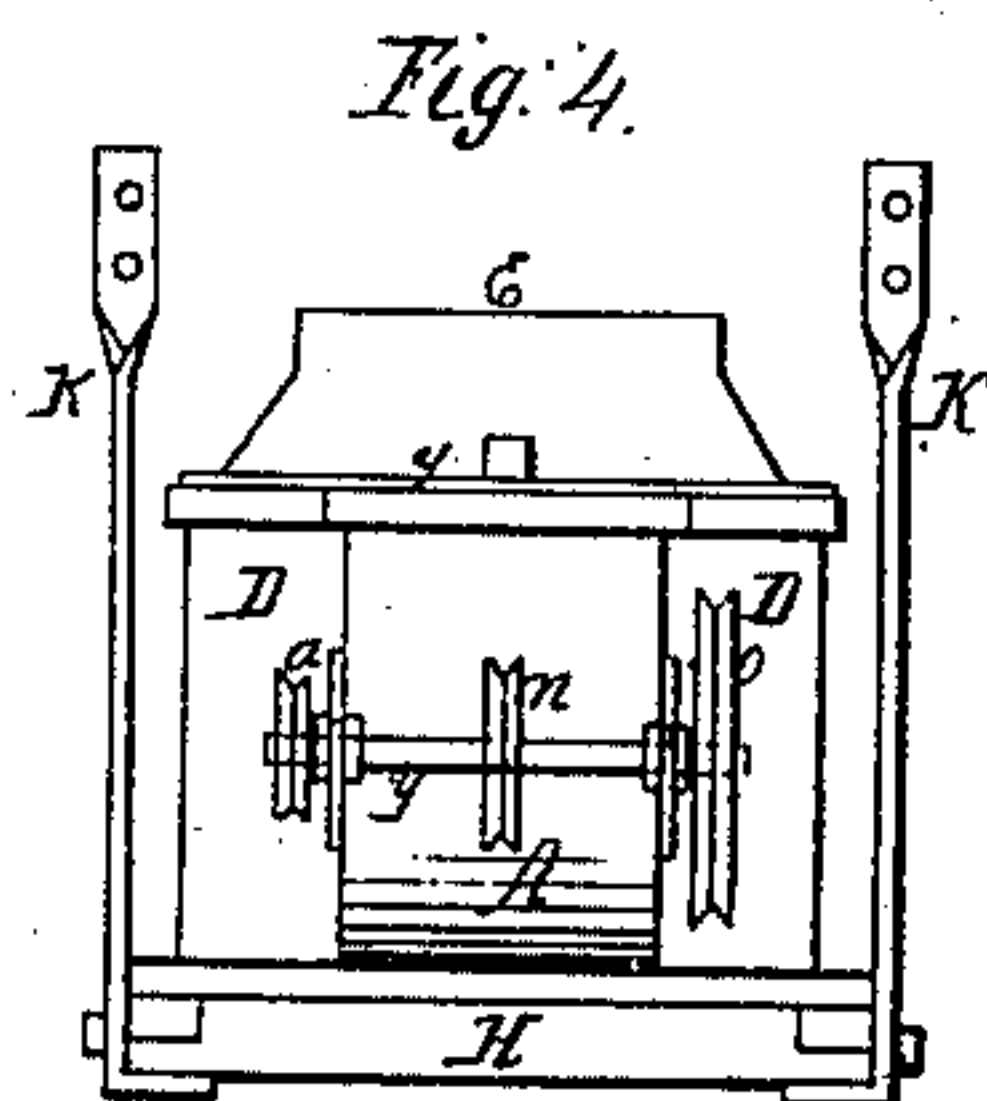
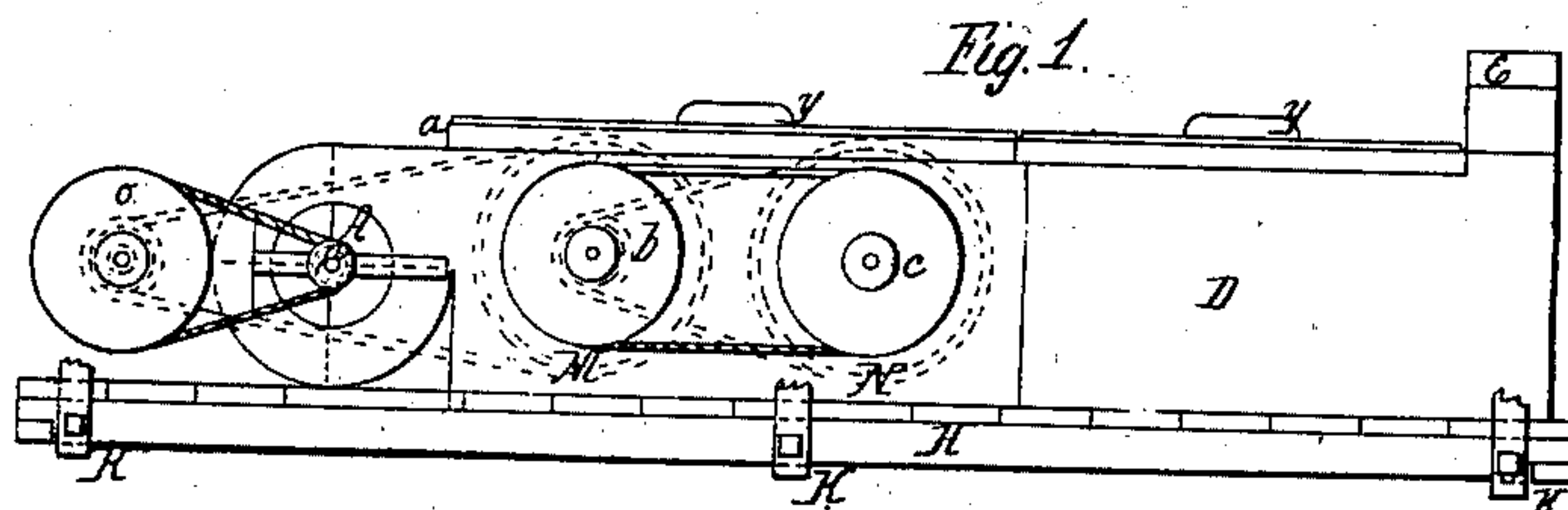
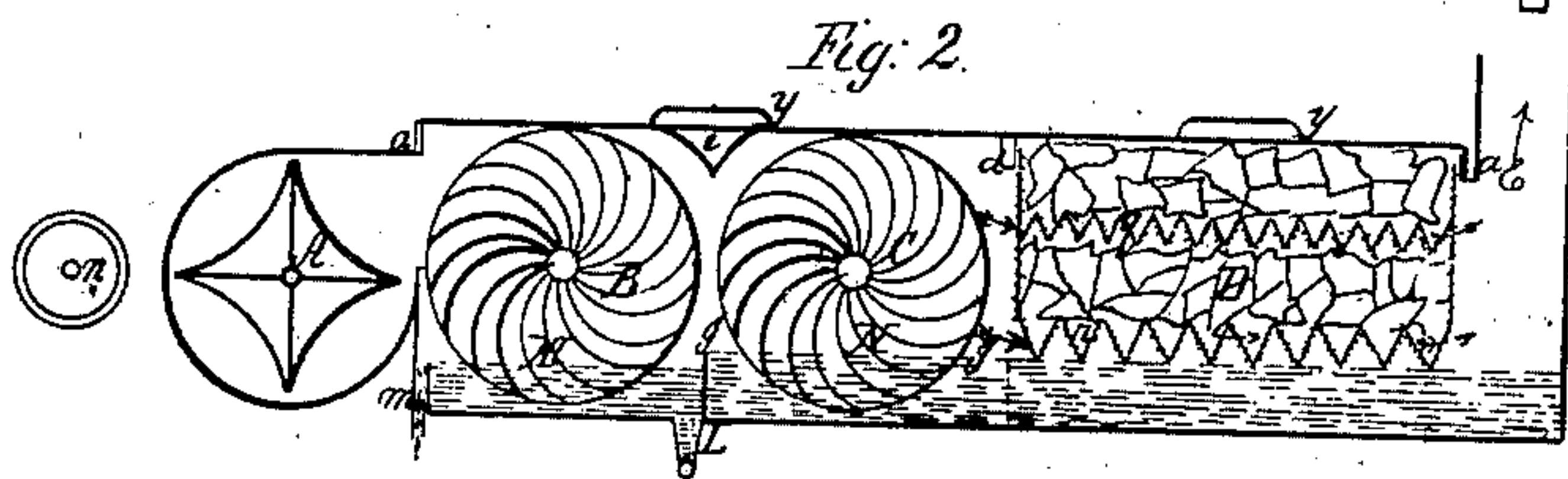
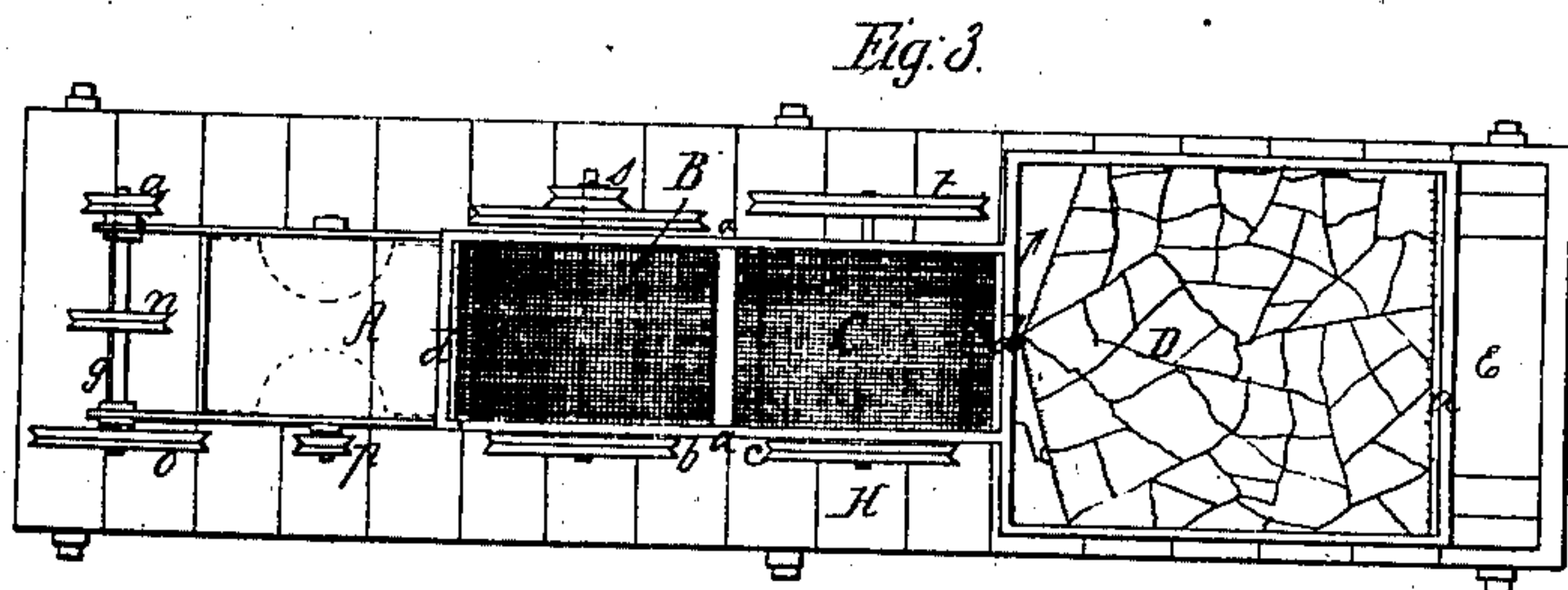
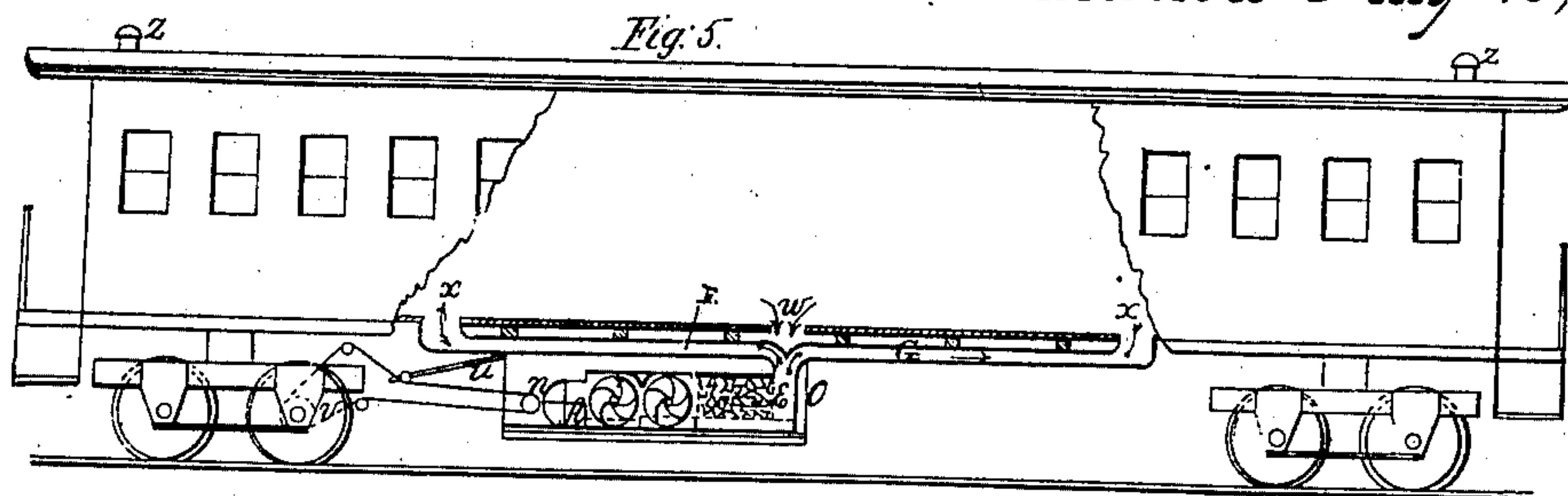


J. R. Barry,

Car Ventilator,

N^o. 12,851.

Patented May 15, 1855.



UNITED STATES PATENT OFFICE.

JOB R. BARRY, OF PHILADELPHIA, PENNSYLVANIA.

VENTILATING AND COOLING APPARATUS.

Specification of Letters Patent No. 12,851, dated May 15, 1855.

To all whom it may concern:

Be it known that I, JOB R. BARRY, of the city of Philadelphia and State of Pennsylvania, have invented a new and useful machine for effectually ventilating and cooling railroad cars, omnibuses, stages, and other closed vehicles, and for ventilating and cooling public and private buildings, in whole or in part, steamboats, steamships, and sailing vessels, called "Barry's ventilating and cooling apparatus"; and I do hereby declare that the following is a full, exact, and clear description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side view; Fig. 2, a longitudinal section; Fig. 3, a top view with covers removed; Fig. 4, an end view; and Fig. 5 a view of a car, partly in section, with the machine annexed beneath, and showing the air passages.

The same letters are used for the same parts in the different figures.

"A" in Figs. 1, 2, 3, 4 and 5 is a fan driven by a belt from the pulley O, on the intermediate shaft *g*, which is driven by a belt from the pulley *v*, on the axle of the car, as in Fig. 5.

This fan I propose to make sufficiently large and drive with a velocity when attached to a rail road car, that it will supply 2500 cubic ft. of air per minute when the car is going at the rate of 20 miles per hour and as this amount is about equal to the capacity of the car, it is evident that with such a volume constantly coming into the car there will of necessity be a pressure outward through all of the openings and cracks in the car as well as out through the ordinary ventilators in the top which must effectually, ventilate the car and prevent the entrance of dust smoke and sparks. And as the air enters the car at a temperature of about 50° it is also evident that its temperature may be reduced to as low degree as comfort can require.

B and C, in Figs. 2 and 3, are refrigerating wheels made of coarse wire gauze, cloth, or other open work, which are made to revolve by belts traversing from the pulley *a*, on the intermediate shaft *g*, (see Figs. 3 and 4) to the loose pulleys, and from *s* to *t*, and from *c* to *b*. These wheels or revolving open work may be made in a variety of forms and of different material, the object

contemplated being to expose as large an amount of cold wet surfaces as is practicable, for the air to come in contact with, without materially obstructing the current or offering too much resistance in passing through the water. I propose to use two or more such refrigerating wheels each one revolving in a separate reservoir of water, and so arranged as shown in Fig. 2 that the wheel next to the fan revolves in the shallowest water and the wheel next the ice box in the deepest. The objects contemplated and secured by this arrangement are the effectual warming of the water to very near the temperature of the inflowing air, before the water is allowed to escape at *m* see Fig. 2 and the cooling of the air to very near the temperature of the water in which the wheel next the ice box revolves.

I do not wish to restrict myself to the use of this particular mode of cooling the air, but use as circumstances may warrant any other mode that will as effectually cool the air and warm the water.

D, in Figs. 1, 2 and 3, is the ice box, containing shelves for ice, so arranged with coarse wire gauze between the ice box and wheel reservoir as to prevent the ice falling into the wheel reservoir.

g, and *r* are passages for the air through the ice box.

E, in Figs. 1, 2, 3, 4 and 5, is the air flue.

F and G, in Fig. 5, are air passages, and although shown as conveying the air toward the end of the car they may be reversed and serve as the return flue to convey back the air that does not escape at the ventilators in the top of the car and at the crack of the windows, to the box inclosing the apparatus from whence it is again drawn by the fan with air direct from outside of the inclosure and driven up into the car again through registers so arranged that a horizontal direction is given to the current, thereby diffusing it uniformly through the entire car.

As the volume of air furnished by the fan is at least 10 times as great as is actually needed for ventilation alone it is evident that if 1/10 of the volume or 250 cu. ft. of air be driven out of the car per minute, there will be 9/10 of the volume or 2250 cubic ft. of air circulated every minute through the lower portion of the car from the discharge registers in the middle to the return registers at the end or vice versa.

The advantages of the return flues are that while there is a sufficient amount of air escaping at the ventilator and cracks of windows &c. for healthful ventilation, there is 10 times that amount circulated through the car for the purpose of lowering the temperature.

H, in Figs. 1, 3 and 5, is a frame sustaining the machine, and suspended from the car by the hangers K, K, as in Fig. 4, being the bottom of a box inclosing the whole apparatus.

"O" is an adjustable slide door in the end of said box.

I, in Fig. 2, is a partition between the wheels B and C designed to prevent the circulation from M to N of the water so that any dust that may accumulate is washed off and flows out as muddy water at *m* or settles and is collected and drawn off at proper intervals at L.

J, in Fig. 2, is a perforated partition, admitting of a free circulation of the water from the ice box D to the wheel box N, but preventing the ice from coming in contact with the wheel C.

n, in Figs. 2, 3, 4 and 5, is a pulley driven by a belt from the axle of car, as in Fig. 5.

d, in Figs. 2 and 3, are recesses, all around the wheel boxes B and C and the ice box D, for the lids to fit into, forming, when filled with water, an air tight joint.

y, y, in Figs. 1, 2 and 4, are the lids, or covers.

p, in Figs. 1 and 3, is a pulley on fan shaft.

e, in Fig. 2, is a tin deflector.

u, in Fig. 5, is a belt tightener.

w, is a return register communicating with the box inclosing the whole apparatus.

x, x, in Fig. 5, are the registers admitting the air to the car.

Z, Z, in Fig. 5, are openings in the tops of cars for vitiated air to escape.

The operation of the apparatus, when used for ventilating and cooling rail road cars, is as follows. The windows of the car being closed, and the cars put in motion, the fan "A" is made to revolve as before shown, and is supplied with air by means of the adjustable slide door O (see Fig. 5) and the return air from register *w*, and the air is then driven in the direction of the arrows through the wheels B and C, (see Fig. 2), thus coming in contact with a large amount of wet and cold surfaces on the wheels, reducing the temperature of the air to nearly that of the water in which the wheel C revolves.

The wheels are made to revolve as close as practicable to the covers *y, y* with their lower parts in water to the depth of one fourth, or one fifth, of their diameters.

The top of the discharge pipe *m*, being lower than the partition "P," the water in

M will of necessity be lower than in N. And as the water in M is cooled only by the overflow from N, the supply of cool water is not sufficient to counteract the heating effect of the wheel B revolving in it, consequently the water in M is raised in temperature, before it escapes at *m*, to nearly that of the inflowing air.

After passing through the refrigerating wheels B and C, the air is still further cooled, by coming in direct contact with the ice, in its course through the ice box D, to air flue E, it then rushes through the air passages G and H (seen in Fig. 5) up into the car, where it is diffused, making the air comfortable in the hottest weather.

As it is necessary in very hot weather, to cool a much larger amount of air, than is required for healthful ventilation, in order to keep the temperature of the cars at the proper degree for comfort, the car is provided with a register in the center (see *w* in Fig. 5), communicating with the large box containing the whole apparatus, so that a portion of the air is circulated through the cooler over and over again, while the vitiated air is driven out at the openings in the top of the car at *Z, Z*.

The machine varies in no essential particular, in its application to the ventilating and cooling of omnibuses, stages, and other vehicles, from that of rail road cars, a pulley on the hub of the wheel, answering to the pulley on the axle of the car.

The ventilation and cooling of large buildings, requires no change, but the application of a steam engine, or other sufficient power to drive the fan, &c., smaller buildings and for a limited time, could be cooled and ventilated by the power of a man, and a sick room, or bed with curtains, by a weight, spring, or treadle and pulley.

A train of cars may also be ventilated, and cooled, by placing the apparatus in the baggage, or other car, the air therefrom to be carried through an air tube, in the top of the cars connected between the cars by a flexible tube of cloth, or other suitable material, with registers in each car. When the cars are stopped, the apparatus may be driven by man power.

The cabins, or any parts of steam boats, or steam ships can be ventilated and cooled by placing the apparatus in any convenient place and providing it with air, tubes conducting the fresh air to the fan, and from the ice box to the place desired to be cooled or ventilated. In sailing vessels, the power to drive the fan can be either man power directly, or the wind acting on sails for the purpose, or a wheel rolling on the surface of the water.

I do not claim the devices herein described for excluding dust from rail road cars, separately, nor do I claim the passing air

through an ice reservoir for the purpose of cooling the same previous to its introduction to an apartment, but

What I do claim and desire to secure by
5 Letters Patent is—

The arrangement of a fan and one or more refrigerating wheels or their equivalent with the water tanks ice reservoir and re-

turn air flue, substantially as described for securing effectual ventilation and cooling 10 the air in the manner and for the purposes herein set forth.

JOB R. BARRY.

Witnesses at signing:

EDWIN A. LEUTZ,

GEO. H. EARLE.