

No. 666,050.

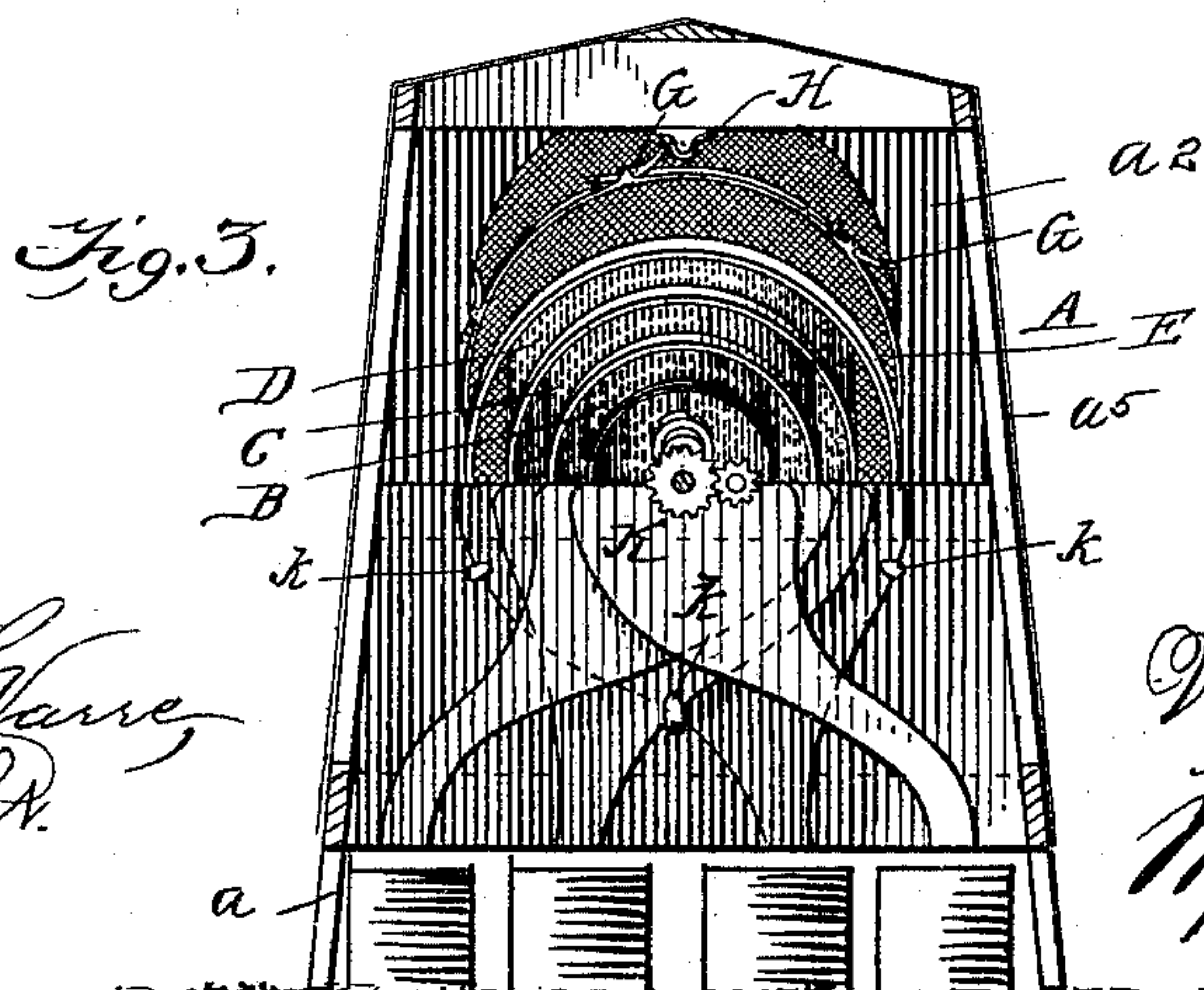
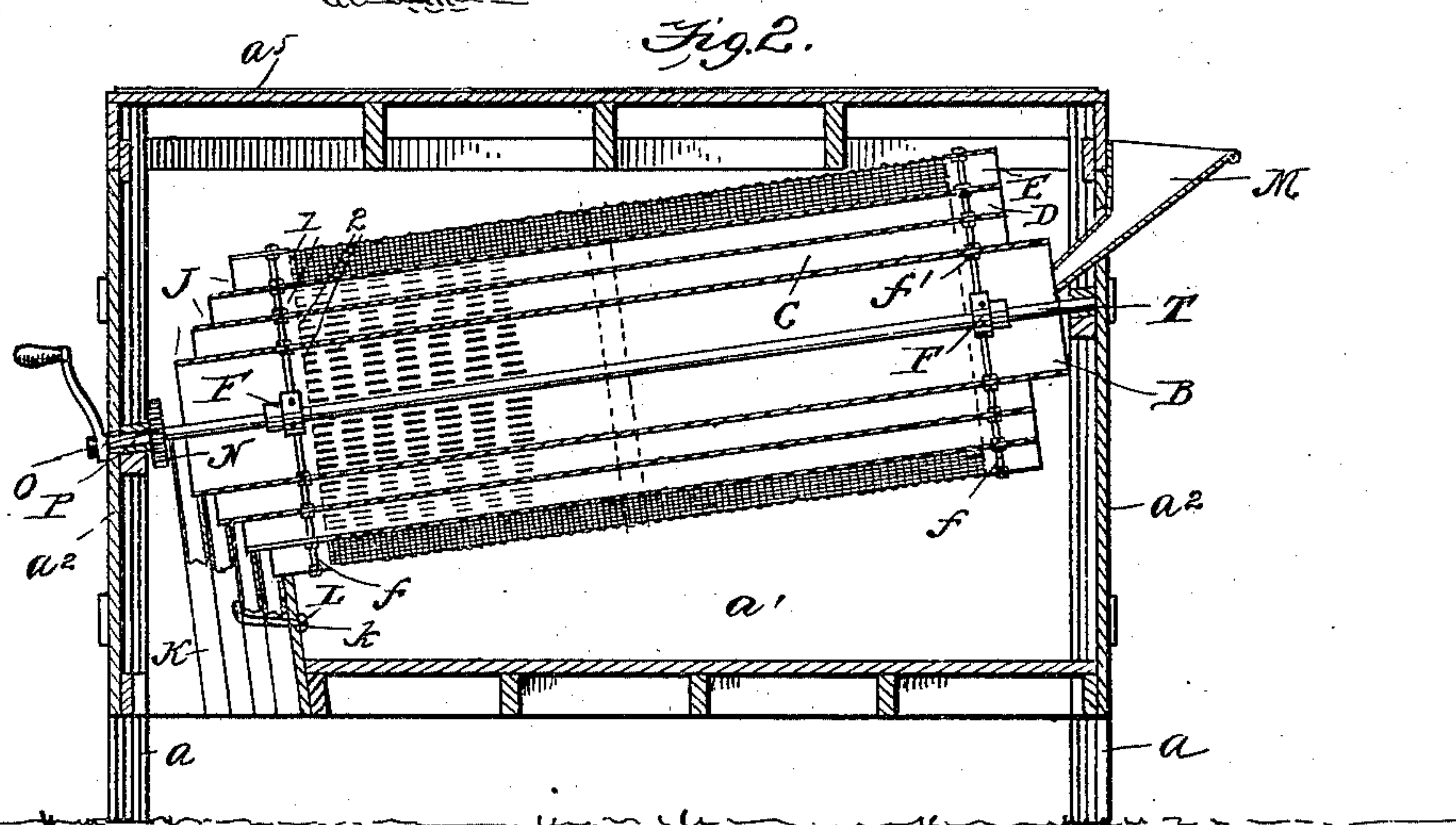
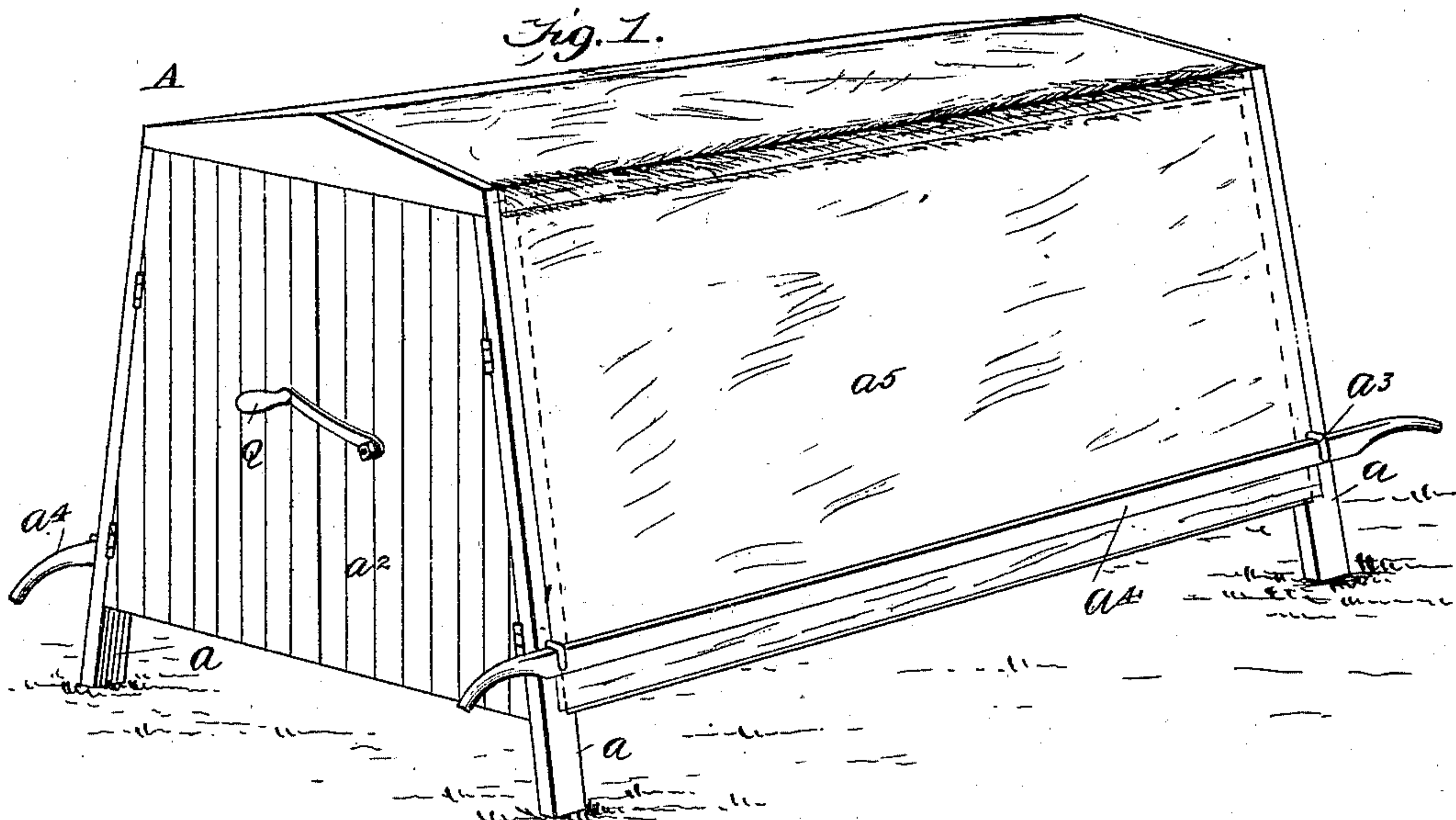
Patented Jan. 15, 1901.

W. GRAY.
GOLD AND ORE SIZING MACHINE.

(Application filed Feb. 23, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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GOLD AND ORE SIZING MACHINE.

(Application filed Feb. 23, 1898.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.

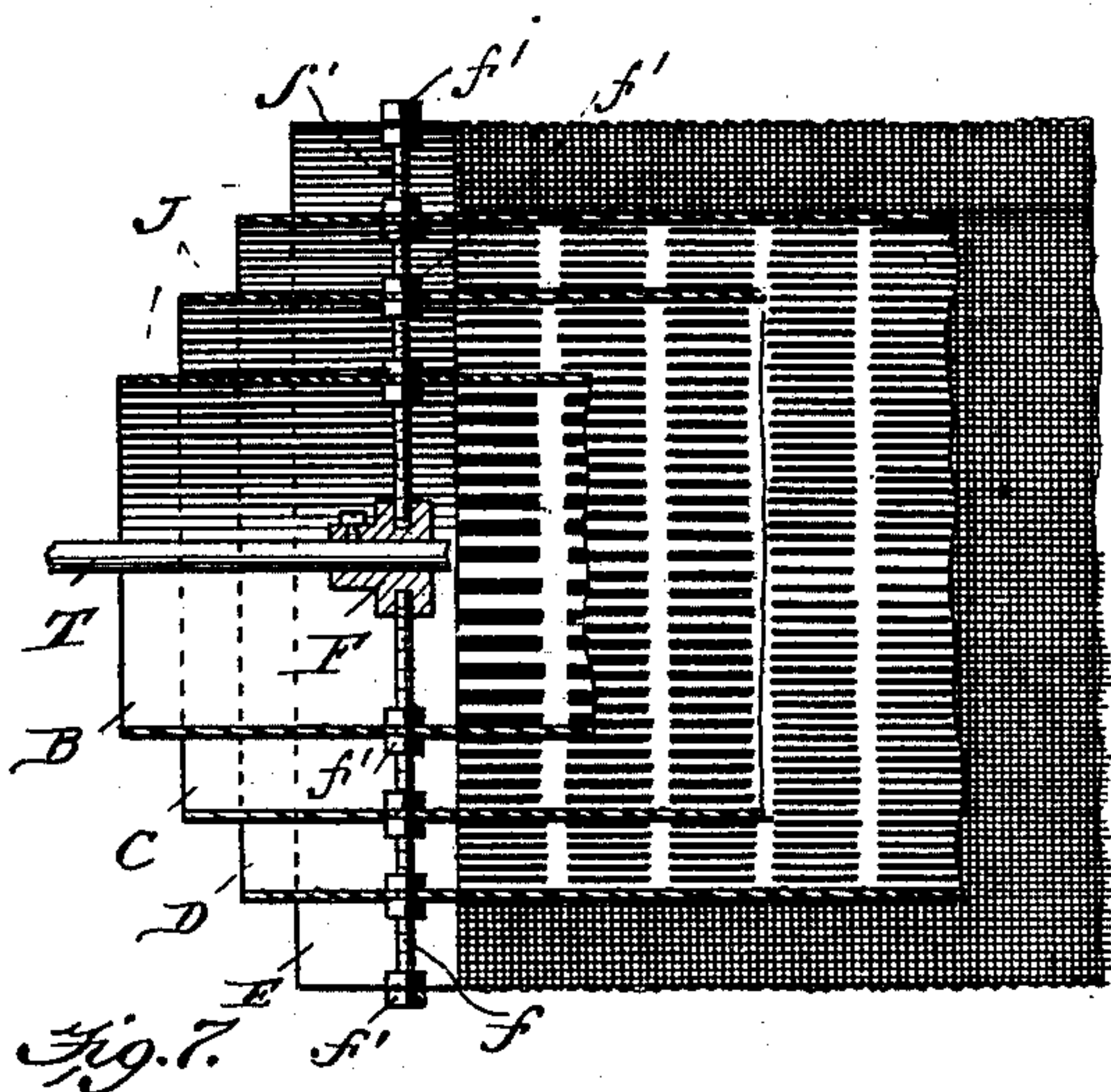


Fig. 5.

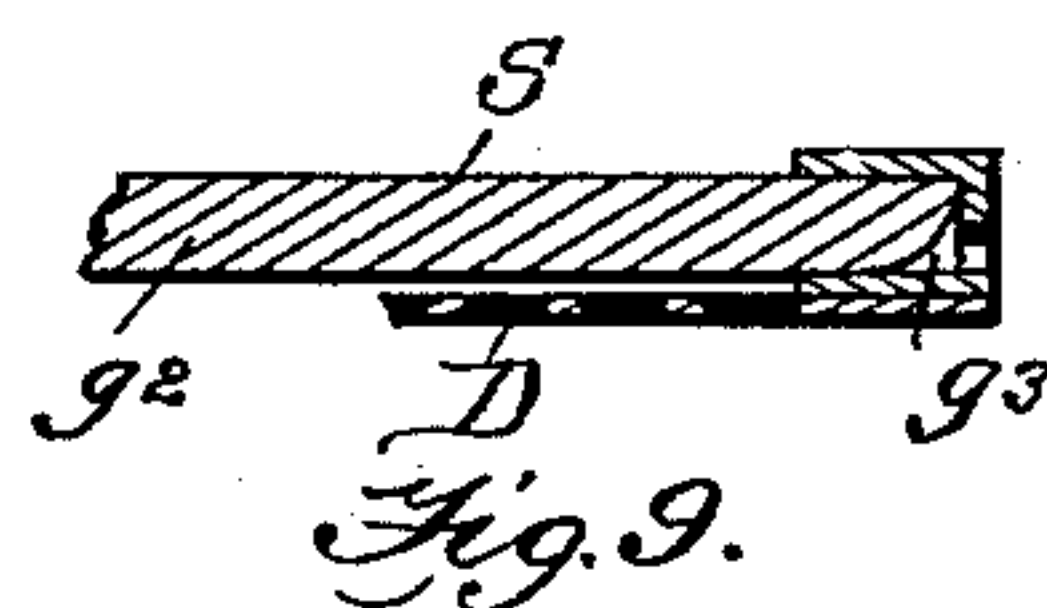
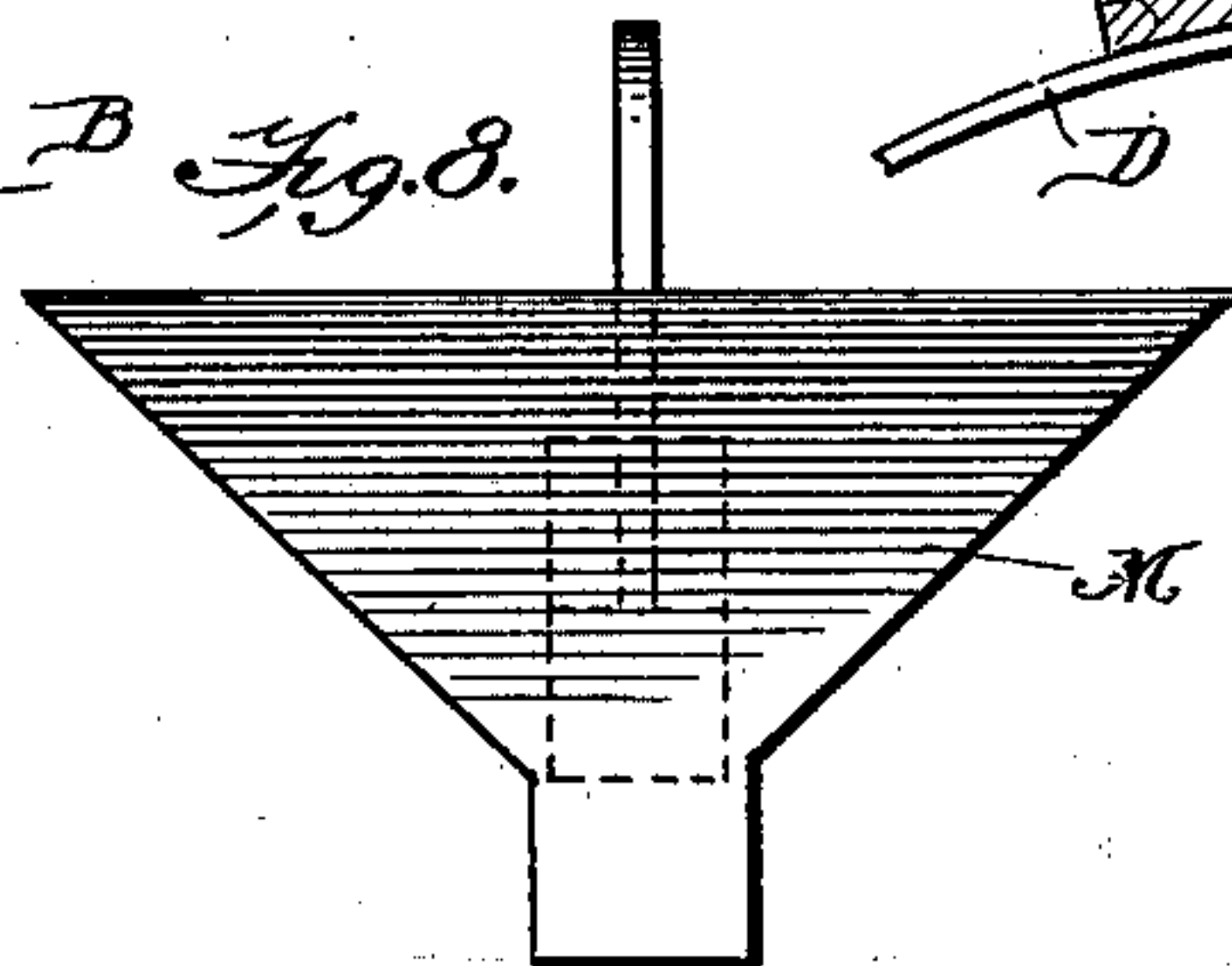
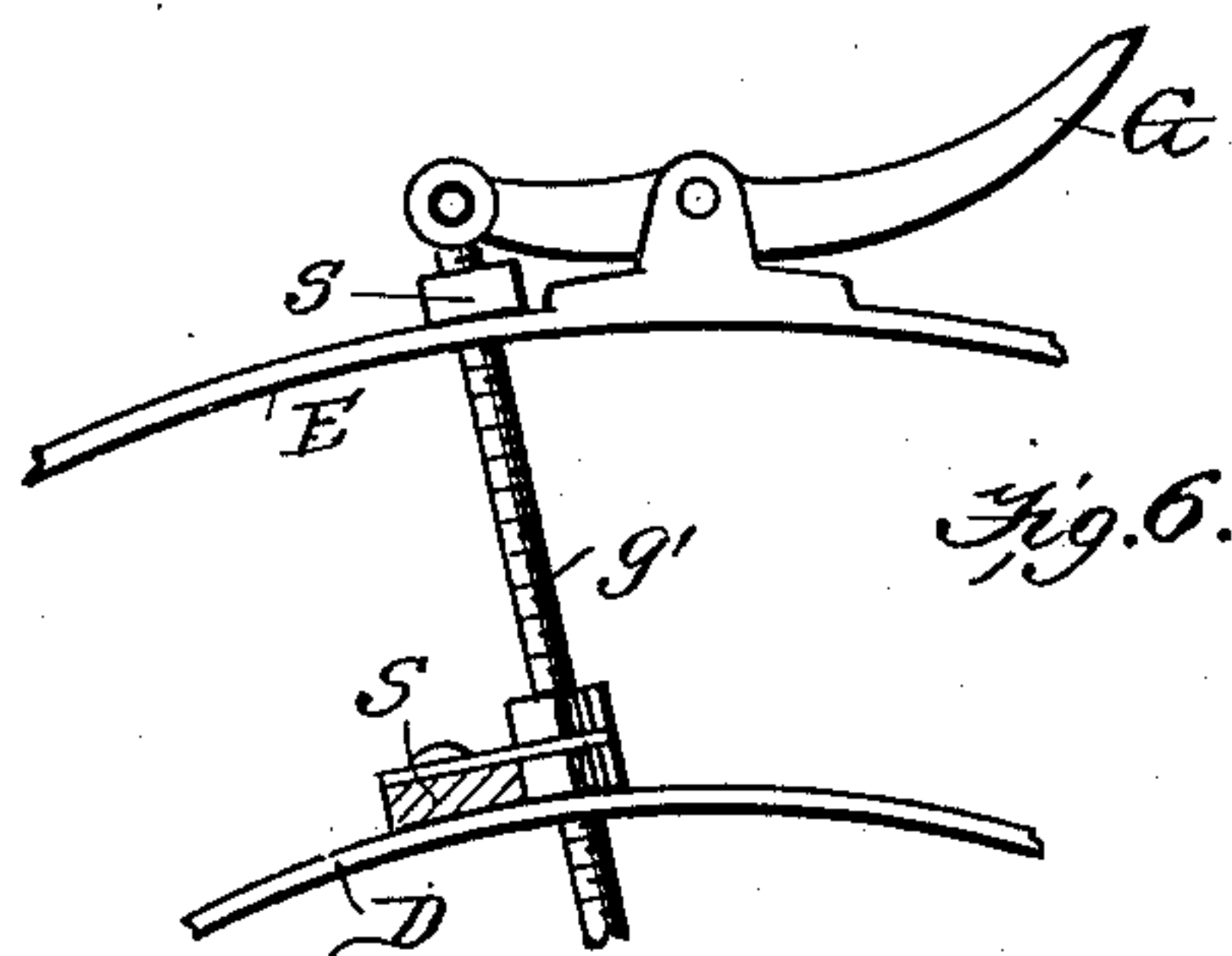
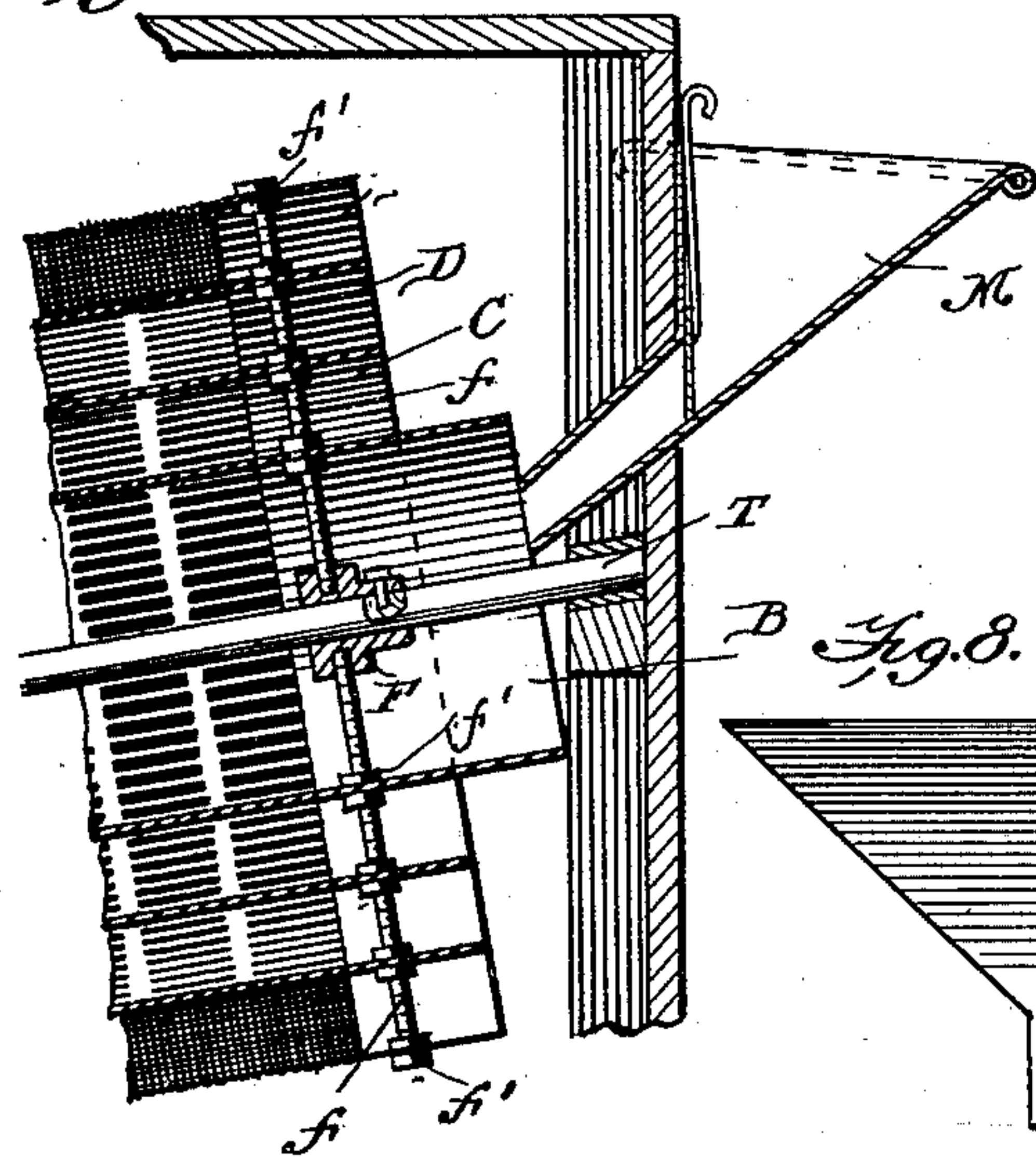
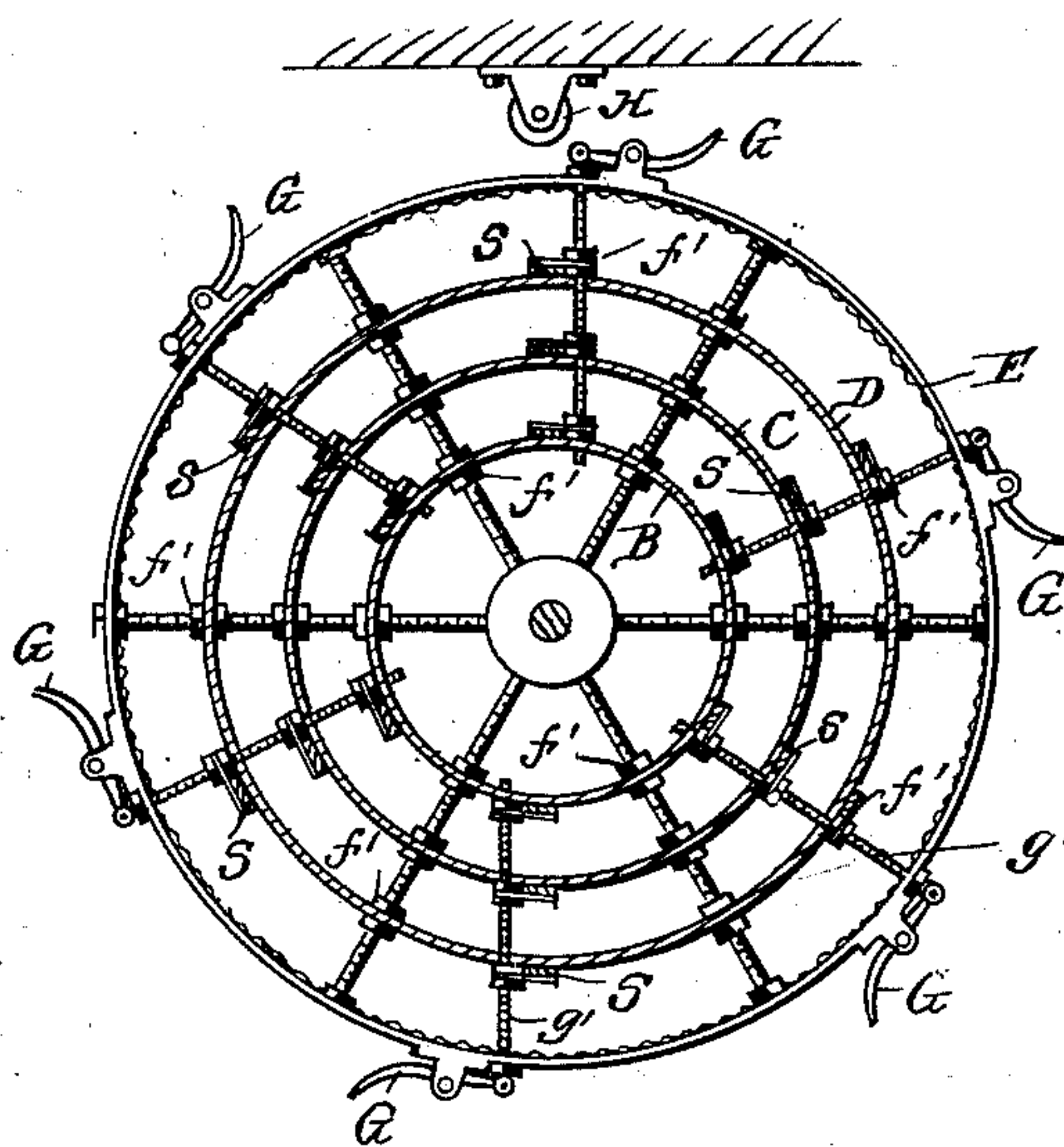


Fig. 10.

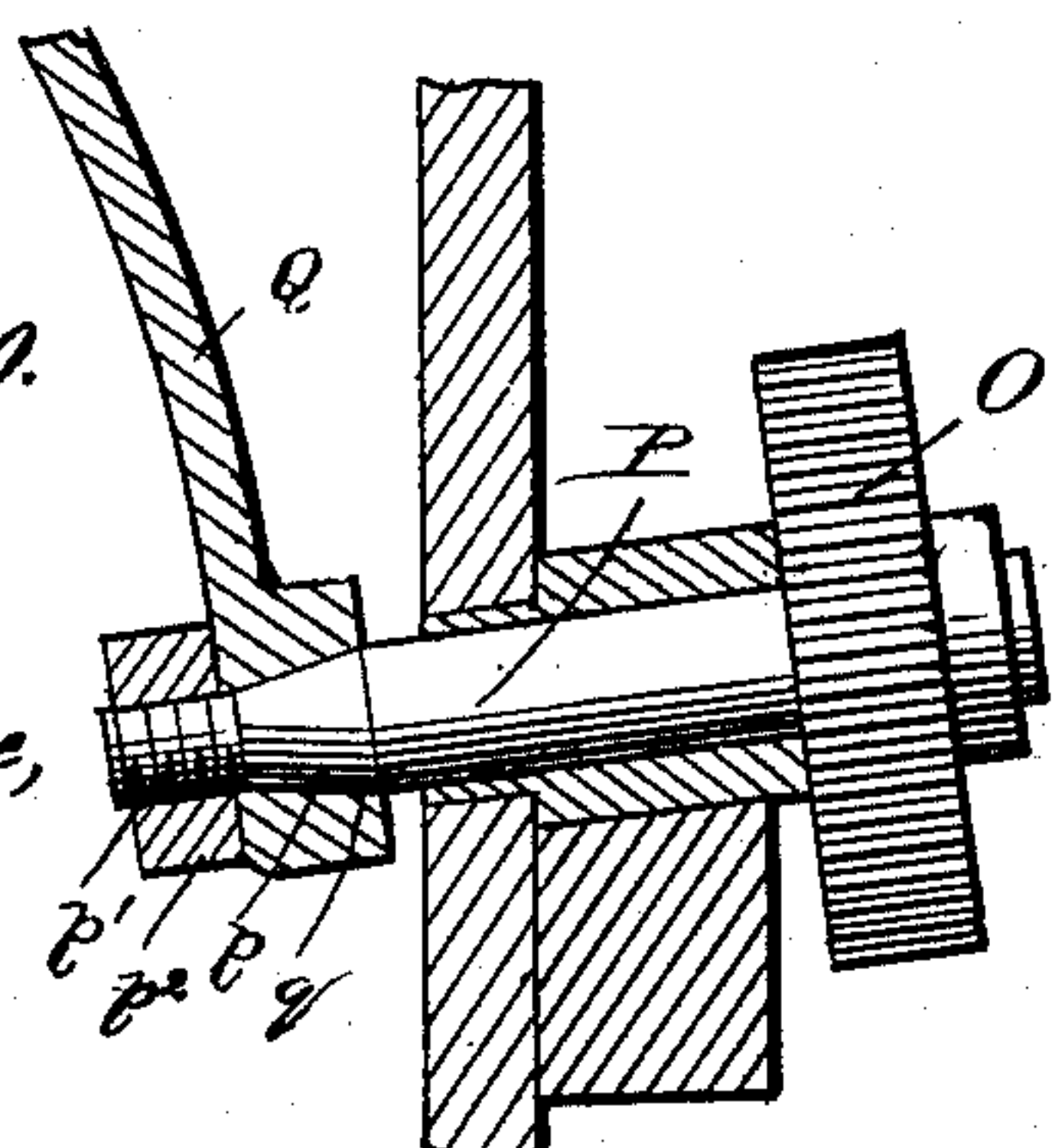
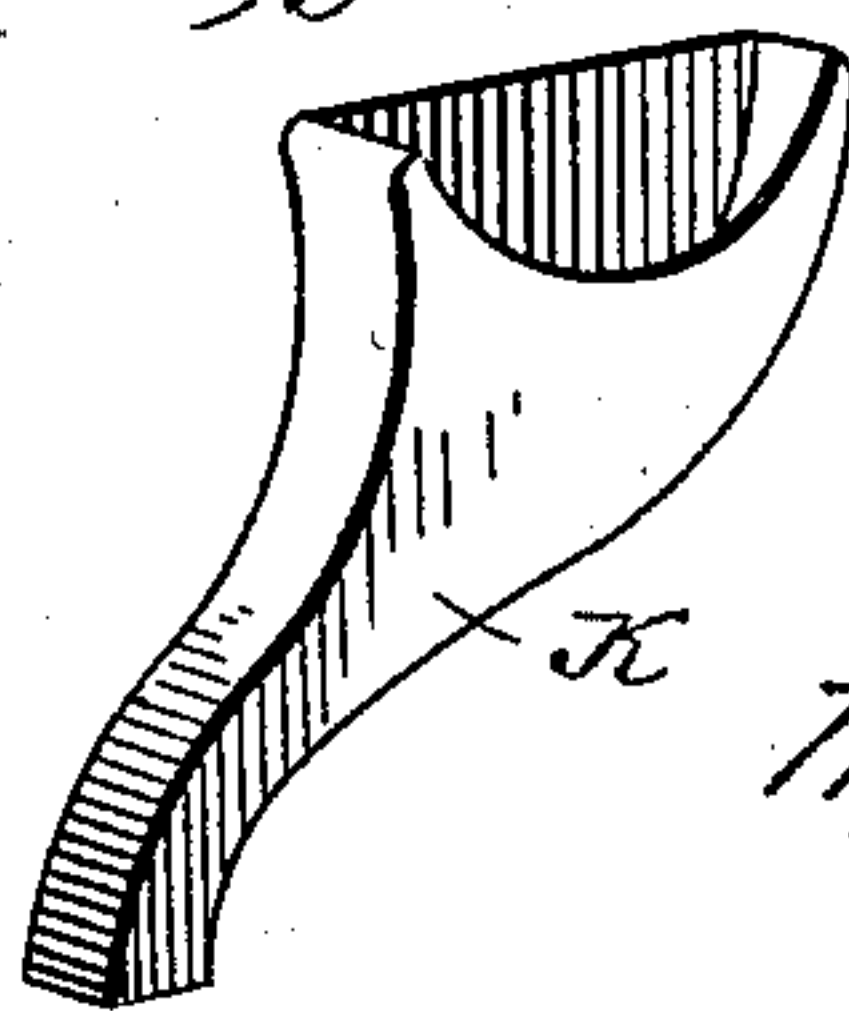


Fig. 11.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM GRAY, OF LINCOLN, NEBRASKA.

GOLD AND ORE SIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,050, dated January 15, 1901.

Application filed February 23, 1898. Serial No. 671,303. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GRAY, a citizen of the United States, residing at Lincoln, in the county of Lancaster and State of Nebraska, have invented certain new and useful Improvements in Gold and Ore Sizing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a preferably portable gold and ore sizing machine which is designed to be used in connection with an air-blast separator; and it consists of certain novel constructions, combinations, and arrangements of parts, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of my apparatus as it appears inclosed in an outer casing and ready for transportation. Fig. 2 is a longitudinal section through the same. Fig. 3 is an end elevation of the machine with one end of the casing removed and the shaft in section. Fig. 4 is an enlarged detail sectional view of the front end of the screens. Fig. 5 is a cross-section of the same. Fig. 6 is a detail view in elevation of a portion of one of the tripping-dogs and the flipper. Fig. 7 is a detail sectional view of a portion of the apparatus, showing the hopper and a portion of the screens. Fig. 8 is a rear view of the back of the hopper. Fig. 9 is a detail view showing the means of securing the flipper to one of the screens. Fig. 10 is a detail sectional view showing the manner of securing the operating-handle; and Fig. 11 is a detail perspective view of one of the spouts, looking at the same from the rear.

The objects of my invention are, first, to produce a simple, portable, and easily-constructed machine which will separate the materials—gold, ore, and sand—which are being treated into different sizes and deposit them into different receptacles, the gold and sand in each respective receptacle being of equal size; second, to provide means for “flipping” or striking the screens on their upper surfaces or sides as they revolve, so as to dislodge any particles of gold or sand which may have become wedged in the meshes of the

screens, and, third, to arrange the screens on an incline and to terminate the lower ends of the screens in rear of one another and provide a novel construction of discharge-spouts which will conduct the sized materials to different receptacles.

To accomplish these ends, my invention consists of certain novel constructions, combinations, and arrangements of parts, as will be described.

In the drawings, A represents a suitable frame, which is approximately rectangular in form, being somewhat larger at bottom than at top, and is provided with legs *a*, which raise the body portion proper of the casing from off the ground and enable the screens of the machine to be given a more or less inclination, as circumstances may require, in treating certain grades of earth by setting the front or rear legs in holes in the ground, though usually the inclination of the screens shown in the drawings will be sufficient to properly treat the same, it only being in a few instances that it will be found necessary to incline the body of the machine proper. The bottom of the frame is constructed to form a compartment or receptacle *a'* for saving the finest, which is usually the richest, materials. The front and rear of the casing or frame are provided with suitable doors *a²*, hinged to said frame and provided with means for locking the same. The frame is also provided with means *a³* to engage removable handles or bars *a⁴* for aiding in carrying the machine from place to place. The sides and top of the frame are also preferably covered with canvas *a⁵*. By this construction of the frame or casing the same is rendered portable and the machine can be easily and conveniently carried up and over very uneven and rough ground by parties using the same, thus making it possible to treat earth in localities which have been heretofore abandoned on account of the difficulty of getting to the same.

B, C, D, and E represent cylindrical screens, which are arranged one within the other and which are secured together by means of a centrally-arranged shaft T, which carries hubs F, having radiating arms *f*. The arms *f* are threaded throughout their entire length and are screwed into the hubs F, as shown in Fig. 6. The screens are arranged about three

inches apart and are secured in position on the arms of the hub by means of double jam-nuts f' , one nut being located inside the screen and the other on the outside thereof. By this construction the screens are not only held steady at the proper distance apart, but can be easily adjusted to any desired position.

It being necessary for the most efficient working of the screens that they be clean at all times, I provide flippers S , which are so constructed and arranged that the screens will be automatically and continually struck or jarred on their upper surfaces, thereby more successfully shaking the sand from that part of the under side of the said screens. To accomplish this object, I provide at suitable points on the outer screens a number of dogs G —say six—which are pivoted to a band surrounding said screen. To the inner end of the dog is pivoted a rod g' , which latter extends through and to the innermost screen. The said rods g' are connected to spring-strips g^2 , preferably of wood, which extend from end to end of said screen, the ends of the strips being set into a socket g^3 and the said socket secured to the ends of the screens. The free or outer ends of the dogs extend up a considerable distance above the pivot-point of the said dogs and are designed to be struck by a roller H , secured to the frame of the machine immediately above the screens and in line with the dogs. By this construction and arrangement it is obvious that as the screens revolve the outer free end of the dogs will be struck by the roller and depressed and the rods connected to the inner ends of the dogs thereby raised and the spring-strips to which said rods are connected likewise raised until the dogs have passed by the roller, when the parts will be released and the flippers will be caused to strike all of the screens automatically and simultaneously on their upper surface. By the use of cylindrical rotary screens instead of flat screens having a vibrating movement and arranging the flippers so as to strike the screens on their upper surfaces I am enabled to much more readily clean the screens, as all tendency of the sand or gold to simply move back and forth in the machine without dropping out is overcome, the sand and gold in my construction falling out readily by gravity. The screens, preferably four in number, are arranged concentrically one within the other and about three inches apart, as above stated. These screens, except the outer screen, are constructed of perforated plates, the perforations in all the screens being of the same length and being elongated and extending parallel with the axis of the screen, and the widths of the perforations in each respective screen are the same; but the widths of the perforations of the different screens decrease in size one-half from the inner to the outer screens. The outside screen is constructed of woven wire, the mesh of which is of a diameter equal to one-half

the diameter of the mesh of the next succeeding outer screen, as shown in Fig. 4.

I regard the decrease of the size of the mesh of the respective screens, as just described, as one of the important features of my invention, as by this construction the fewest number of screens possible are required and the materials being treated will be found to be sufficiently separated in sizes so that there will be no difficulty in separating the gold or ore from the sand by the air-blast separator. It will also be seen that by this construction the gold and sand of one diameter will be accurately separated from gold and sand of larger or smaller diameters and deposited into separate receptacles. It will also be observed that by this construction particles of wire or elongated gold will assume a position in the screens at right angles to the movement of the rotation of said screens and parallel with the elongated mesh, so that such elongated or wire gold will be separated with particles of sand having a diameter not greater than its own, while without the use of the elongated mesh or openings particles of such elongated or wire gold would be deposited with particles of sand having a diameter equal to the length of said gold, thereby rendering it more difficult to separate the gold from the sand in the blowing action.

I am aware that it is not new to arrange screens one within the other. It may not be new to provide elongated openings in rotary screens which extend parallel with the axis of rotation; but I am not aware that it is old to provide a series of rotary screens arranged one within the other, the smallest diameter of the mesh of each screen being decreased one-half in size from the inner to the outer screens. The rear ends of the screens terminate back of one another, as shown at J , for the convenience of the discharge of the material being treated and for the attachment of a simply-constructed spout or chute K , as will be hereinafter described. The screens are imperforated a considerable distance inside of their ends to the points 1 1 and 2 2. This is done to strengthen the screens at these points. The spouts K above mentioned are made, preferably, of sheet metal and preferably are formed with a flat side extending in front of the end of the cylinder, at right angles to the axis thereof, and with an opposite side cut away to conform to the contour of the screens, said spouts being secured to the frame of the machine by means of bolts k . The construction of one of the spouts is shown in Fig. 11. The spouts are located at the discharge ends of all of the screens, the material passing down through the spouts, except that discharged through the outer screen, which is collected into a compartment below the said screen. The spouts are preferably soldered together, so as to form one integral spout having distinct and separate discharge-openings and the whole secured to

the frame of the machine by suitable bolts and nuts L. By this construction and arrangement it will be observed that these spouts are at right angles to the axis of the screens and that by being so they are easily constructed, as all joints within the said spouts are square or flat, while heretofore it has been necessary to pound out spouts of difficult shapes at great expense in order to gather the different-sized materials from a sizer constructed of interiorly-arranged screens. I am enabled to use such a construction of discharge-spouts by terminating the ends of the screens in rear of one another. I regard this as another important feature of my invention.

The hopper M is of ordinary construction to deliver the material to be treated into the interior of the inner screen and is provided with a suitable gate or valve *m* to regulate the feed of the material.

A gear-wheel N is provided on the shaft carrying the screens near the discharge end of the machine. With this gear-wheel meshes a pinion-wheel O, which latter is carried by a short shaft P, to which a crank Q for operating the said machine is attached. The said short shaft P is provided with a bevel portion *p* and a threaded portion *p'*. The crank is provided with a corresponding beveled opening *q*. The beveled opening in the crank is slipped onto the beveled portion of

the shaft and by screwing on the nut *p²* the crank will be wedged and held firmly in place.

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

1. The combination of a screen-cylinder, means for rotating the same, a series of resilient strips arranged at separated points around the circumference of the screen and extending longitudinally thereof, sockets upon the screen within which the ends of the strips are received, and means for elevating and releasing the strips to cause them to strike the screen successively, substantially as described.

2. The combination of a screen-cylinder, means for rotating the same, two or more resilient strips arranged around the circumference of the screen at separated points, and extending longitudinally thereof, sockets upon the screen for receiving the ends of the strips, dogs pivoted to the screens and connected to the strips, and means for actuating the dogs in succession to cause the strips to forcibly strike the screen, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

WILLIAM GRAY.

Witnesses:

E. T. FENWICK,
JOHN L. FLETCHER.