

No. 609,220.

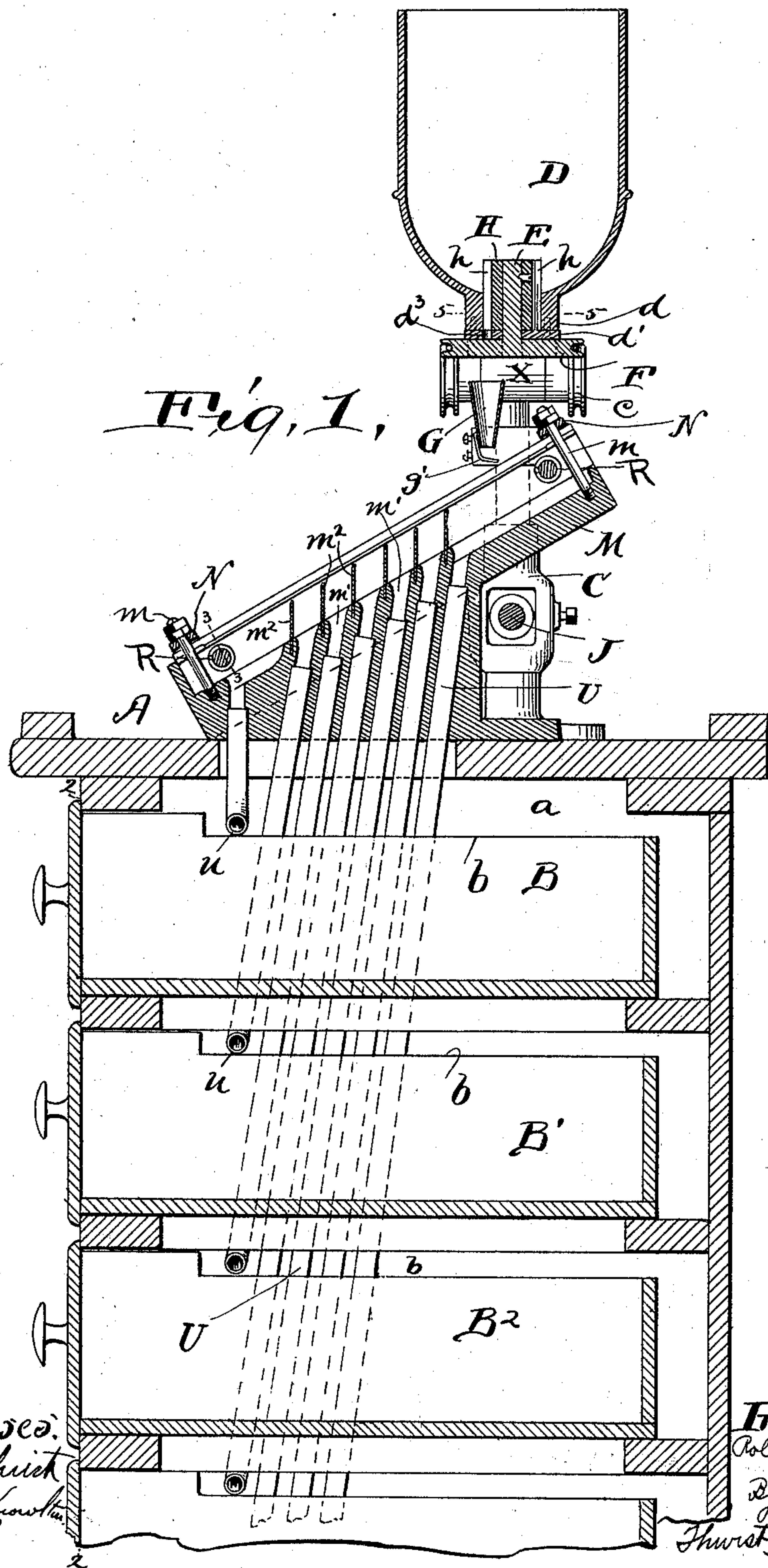
Patented Aug. 16, 1898.

R. H. WHITE.  
MACHINE FOR SORTING BALLS.

(Application filed Nov. 30, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
E. B. Gilchrist  
Philip E. Knowlton

Inventor  
Rollin H. White  
By  
Thurston & Bates  
his attorneys

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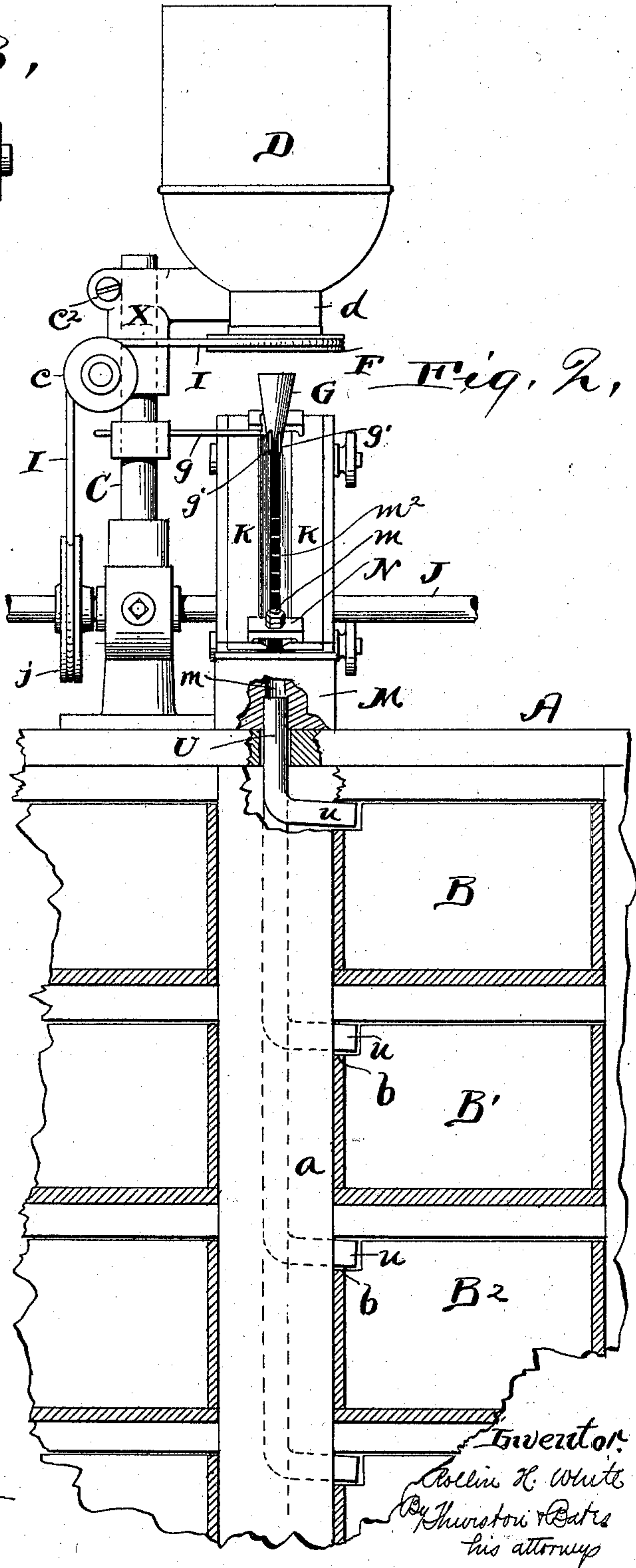
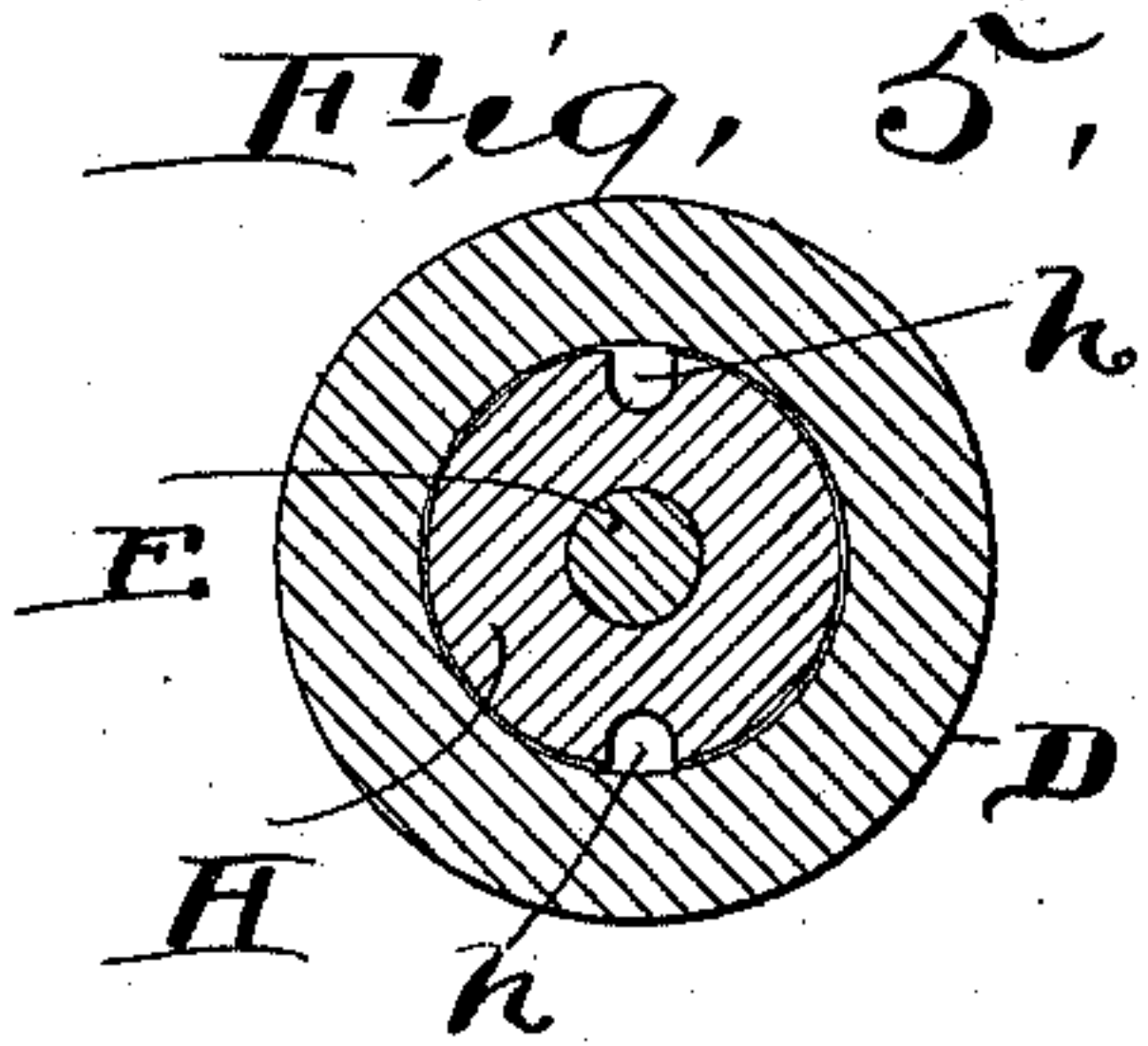
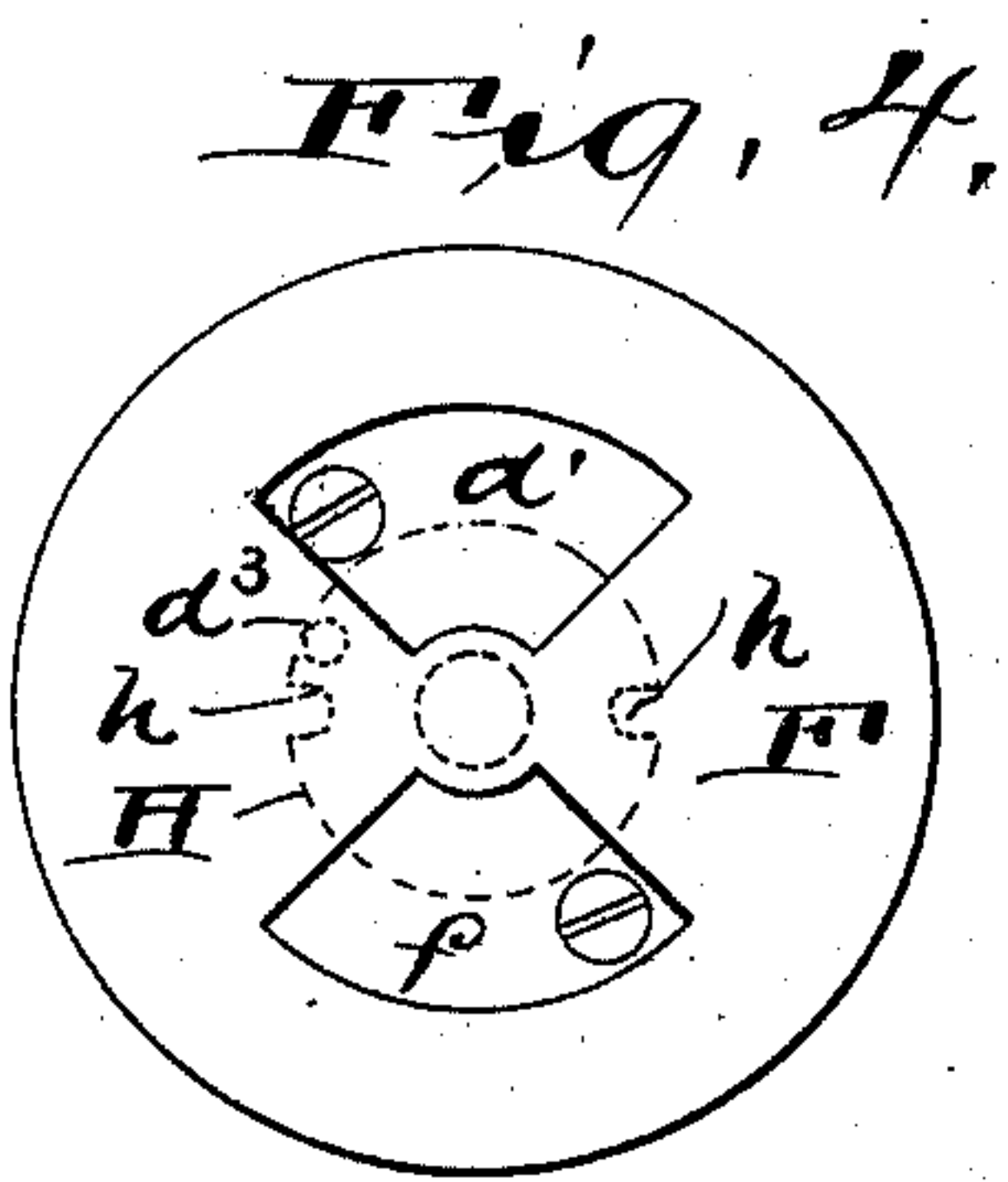
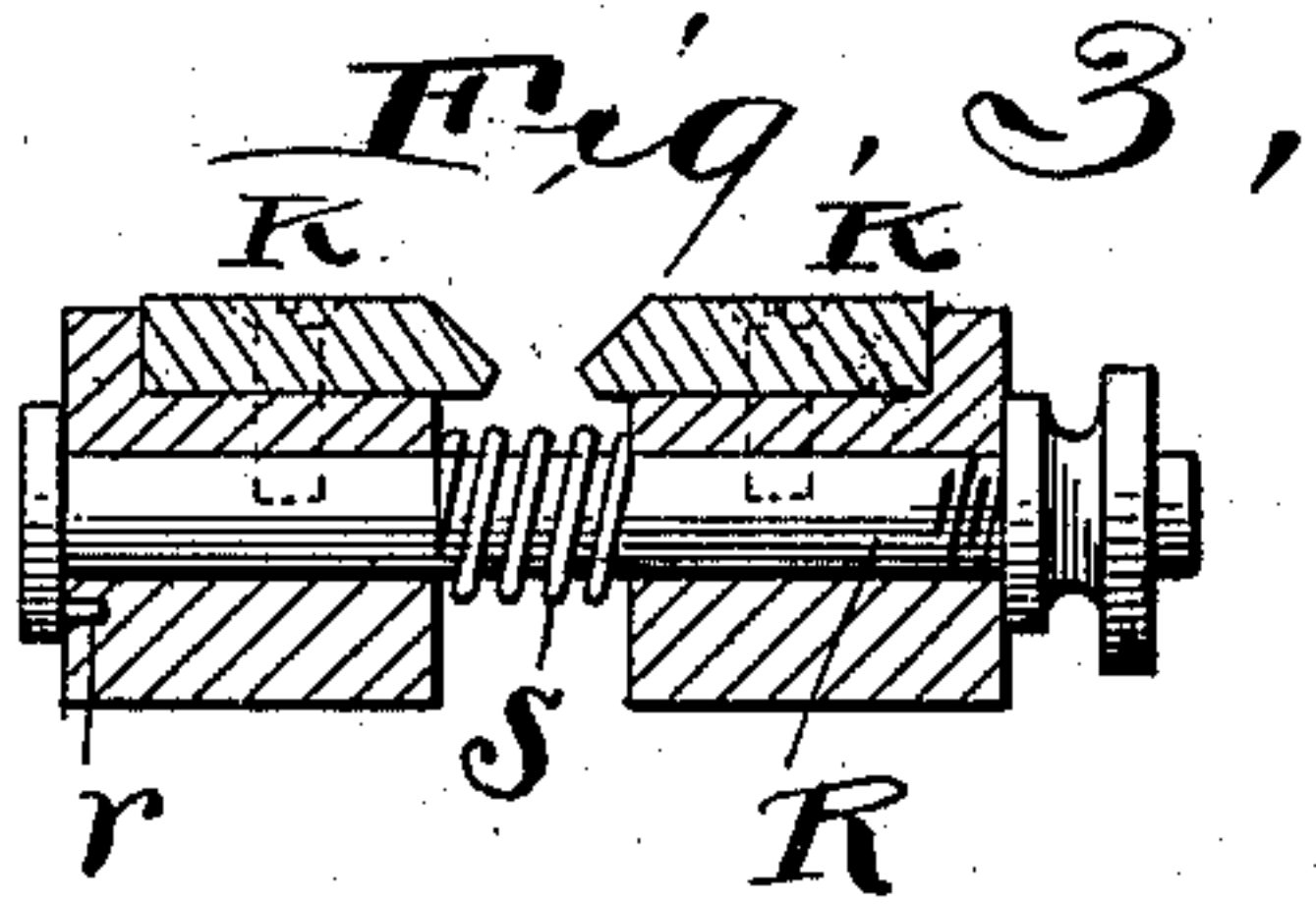
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Philip E. Knowlton

Inventor:  
Rollin H. White  
By Thurston Bates  
his attorney



# UNITED STATES PATENT OFFICE.

ROLLIN H. WHITE, OF CLEVELAND, OHIO.

## MACHINE FOR SORTING BALLS.

SPECIFICATION forming part of Letters Patent No. 609,220, dated August 16, 1898.

Application filed November 30, 1897. Serial No. 660,200. (No model.)

*To all whom it may concern:*

Be it known that I, ROLLIN H. WHITE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Machines for Sorting Balls, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Heretofore balls, oranges, and other spherical or approximately spherical objects have been automatically sorted by allowing them to roll down between two inclined diverging rails, between which said objects drop when they reach a point where the rails are sufficiently separated.

My invention relates to an improvement in machines of this character, the object being to provide a cheap and simple machine especially adapted for sorting antifriction-balls according to their size and delivering the assorted balls into suitable convenient receptacles.

The invention relates particularly to the means for delivering the balls one by one from a hopper to the said inclined rails, to the receptacles into which the assorted balls are delivered, and to the means for delivering said assorted balls into the proper receptacles; and the invention consists in the construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a sectional side elevation of my device. Fig. 2 is a sectional front elevation of the same on line 2 2 of Fig. 1. Fig. 3 is a sectional view on line 3 3 of Fig. 1. Fig. 4 is a bottom view of the pulley. Fig. 5 is a horizontal sectional view through the lower end of the hopper on line 5 5 of Fig. 1, and Fig. 6 is a perspective view of the funnel G and guide-arms  $g' g'$ .

Referring to the parts by letters, A represents a case for a plurality of sliding drawers B B' B<sup>2</sup>, which are the receptacles into which the assorted antifriction-balls are delivered. This case and the drawers are of the usual form except this, that the top edge of one side of each drawer is cut away, as at b, so that the drawer may be pulled out of the case, notwithstanding the fact that the

horizontal end of the delivery-tube extends over the said top edge, so as to deliver balls into the drawer.

On top of the case is a standard C, which supports a hopper D and the mechanism for delivering the balls singly from the hopper to the rails. This hopper has a contracted lower end, so that the balls will find their way to the bottom of the hopper.

There is a circular opening in the neck  $d$  of the hopper, and a plate  $d'$ , the thickness of which is a trifle greater than the diameter of the balls, is secured across the lower end of the neck, and in this plate is a hole  $d^3$ , large enough for one of the balls to pass through easily. A vertical shaft E passes centrally through this plate  $d'$  into the neck of the hopper. On its lower end is fastened a grooved pulley F. A cylindrical sleeve H is likewise fastened to the shaft above the plate  $d'$ , this sleeve being rotatably fitted in the cylindrical neck  $d$  of the hopper. One function of this sleeve is to hold the shaft E in the described position, which it does by resting upon the plate  $d'$ . It is also a combined agitator and ball-delivering device, because, first, one of the functions of the sleeve, which extends some distance into the hopper, is to agitate the balls to prevent them from wedging or arching in the hopper, and, second, another function is to deliver the balls one by one to the opening  $d^3$  in plate  $d'$ . This effect is produced through the agency of one or more grooves  $h$  in the outer surface of said sleeve, which grooves are deeper than the diameter of the balls. In the particular construction these grooves extend from end to end of the sleeve.

The pulley F, by which the shaft J is driven, is so designed that it temporarily prevents a ball in the hole  $d^3$  from dropping out. In order that it may perform this function, this pulley inside the grooved rim is made like a flat disk or plate, which lies close to the plate  $d'$ . One or more holes  $f$  are made in this disk-like part of the pulley, the holes being placed so that they will pass directly under the hole  $d^3$ . The holes  $f$ , however, must not be in the same vertical line with the grooves  $h$ . The pulley is rotated by a



belt I, which passes over two idler-pulleys *c* and under a pulley *j*, secured to the driving-shaft J. As the pulley F and its shaft and the sleeve H are rotated the balls find their way into the grooves *h* in the sleeve. Every time one of said grooves passes over the hole  $d^3$  in the plate  $d'$  one of said balls drops into said hole and rests upon the pulley. When in the further revolution of the pulley its hole *f* comes under the hole  $d^3$ , the ball thence drops into the funnel G. The idler-pulleys *c* are mounted on a shaft which is secured to the same bracket X which supports the hopper, which bracket is vertically adjustable on the standard C, a set-screw  $c^2$  being provided for securing the bracket at the proper elevation.

G represents a funnel which is secured to an arm *g*, which in turn is fastened to the standard C. Two parallel guide-arms *g'* lie just below the mouth thereof, whereby a ball falling through the funnel falls upon them, resting partly upon one, partly upon the other. These arms are slightly inclined downward toward their rear ends, which ends are close to the inclined sorting-rails K, onto which the balls are delivered from the arms *g'* with a slight impetus to carry the balls up said rails.

The sorting-rails K K are inclined downward from their rear toward their front ends. They are supported upon a block M, which rests upon the top of the case. Two clamping-plates N N rest, respectively, upon the upper and lower ends of said rails, down upon which they are drawn by means of the bolts *m m*, which pass through said plates N between the rails K and screw into the block M. The distance between the rails at their ends is regulated by means of two transverse horizontal bolts R, which pass through both of them near their ends, and by coil-springs S, which surround said bolts and thrust endwise against the two rails. Each bolt is prevented from turning by means of a pin *r*, which enters a hole in one of the rails. The other end of each bolt is threaded, and a thumb-nut which screws upon said end affords means for drawing the two rails toward each other. The distance between the rails increases from their upper to their lower ends.

In the block M are a plurality of nearly-vertical holes  $m'$ , which are below the space between the rails. Vertical plates  $m^2$ , which are secured to the block M, lie transverse to the rails and extend across the space between them. The purpose of these plates is to insure the passage of any ball which drops between the rails into the proper hole in the block M. In each of the holes in the block M a tube U is inserted, which tubes all pass down through the side or partition *a* of the case. The lower end *u* of each tube is bent into a nearly-horizontal transverse position, passing over the cut-away edge of one of the drawers, wherefore any ball that drops

between the two rails K K will fall through the proper tube U and be delivered into the proper drawer.

Having described my invention, I claim—

1. In a ball-sorting machine, the combination of a hopper having an inwardly-tapered lower end and a cylindrical neck below said tapered portion, and a plate secured across the lower end of said neck and provided with a hole  $d^3$ , with a rotatable cylinder fitted in said neck and provided with a surface groove whose lower end passes over said hole  $d^3$ , and a rotatable disk F below and close to said plate having a hole *f*, the disk F and cylinder being relatively so placed that the lower end of the surface groove in the latter and the hole *f* in the former are not in the same vertical line, substantially as and for the purposes specified.

2. In a ball-sorting machine, in combination, a hopper having an inwardly-tapered lower end, and a neck below said contracted portion, a bottom plate secured across the lower end of said neck and having a hole for the passage of the balls, a rotatable vertical shaft passing centrally through said plate, a sleeve secured thereto and rotatably fitted in the neck of the hopper, said sleeve having a peripheral groove which extends from end to end and is adapted to pass over the hole in the bottom plate, and inclined diverging sorting-rails onto which the balls are delivered one by one after they fall through the hole in the bottom plate, substantially as and for the purpose specified.

3. In a ball-sorting machine, in combination, a hopper having an inwardly-tapered lower end and a neck below the same, a bottom plate secured across the lower end of said neck and having a hole for the passage of the balls, a rotatable vertical shaft passing through the said plate, a sleeve secured thereto and rotatably fitted in the neck of the hopper and extending up into the hopper, said sleeve having a peripheral groove which extends from end to end and is adapted to pass over the hole in the bottom plate, a driving-pulley secured to the lower end of said shaft close to said bottom plate and having a hole which is not directly below the groove in the sleeve, and inclined diverging sorting-rails onto which the balls are delivered one by one as they fall through the hole in the bottom plate, substantially as and for the purpose specified.

4. In a ball-sorting machine, in combination, diverging sorting-rails which incline downward from their rear to their front ends, a hopper, means for releasing the balls singly therefrom, a funnel into which the balls drop, and two guide-arms below the funnel, which arms extend rearward, whereby the balls which fall through the funnel are caught in said arms, and by them delivered in a rearward direction onto the rails, substantially as and for the purpose specified.

5. In a ball-sorting machine, in combina-



tion, two inclined diverging sorting-rails, a plurality of delivery-tubes below the said rails and adapted to catch the balls which fall between the rails, and a case having a plurality of sliding drawers therein, each drawer having the top edge of one side cut away, the lower ends of said tubes being bent laterally over the side cut-away edges so as to sever-

ally discharge into said drawers, substantially as and for the purpose specified. 10

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

ROLLIN H. WHITE.

Witnesses:

E. L. THURSTON,  
ALBERT H. BATES.