

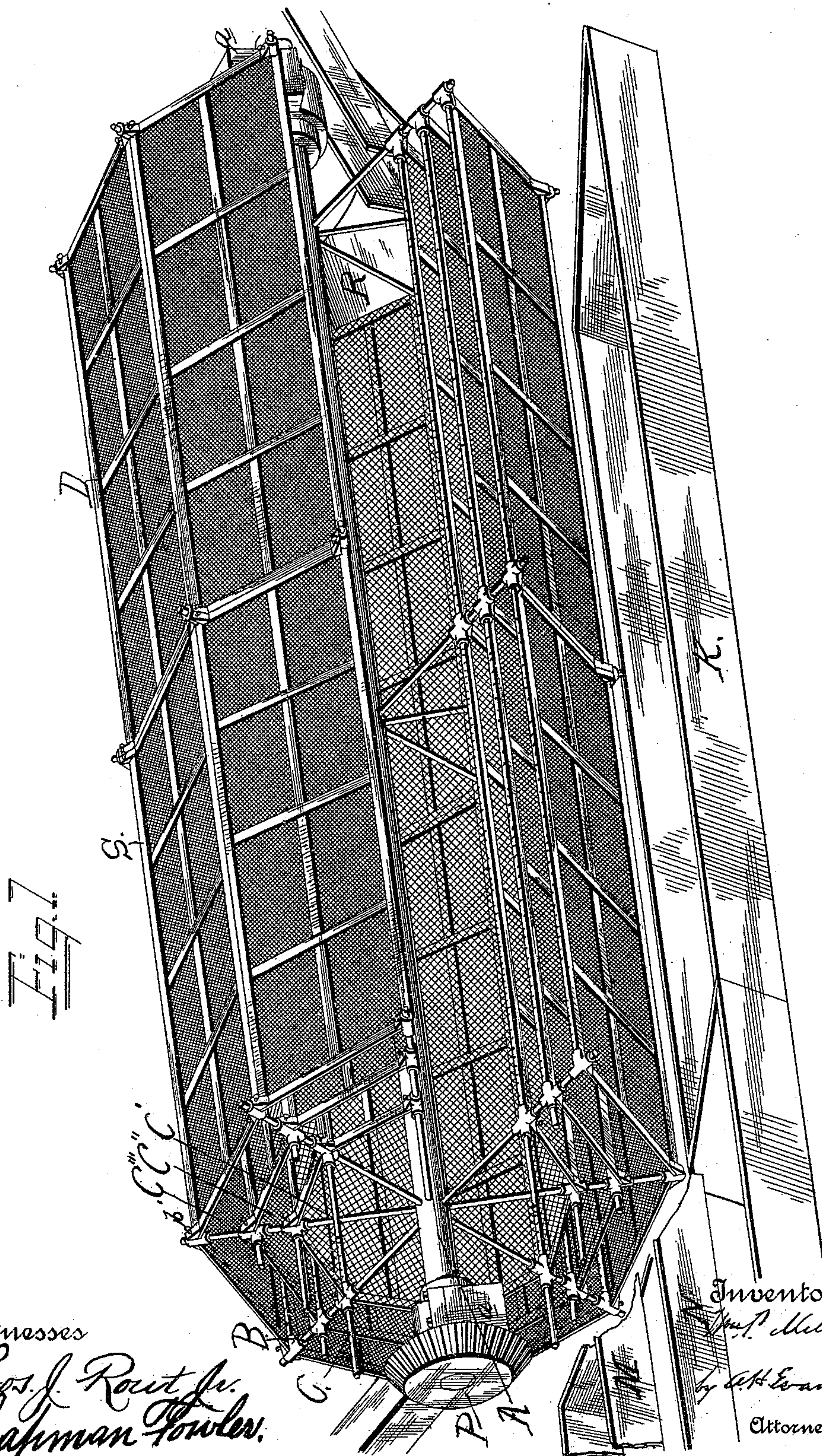
(No Model.)

3 Sheets—Sheet 1.

W. P. MILLER.  
ORE SEPARATOR.

No. 497,474.

Patented May 16, 1893.



Witnesses

Thos. J. Rount Jr.  
Chapman Fowler.

Inventor  
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Attorneys



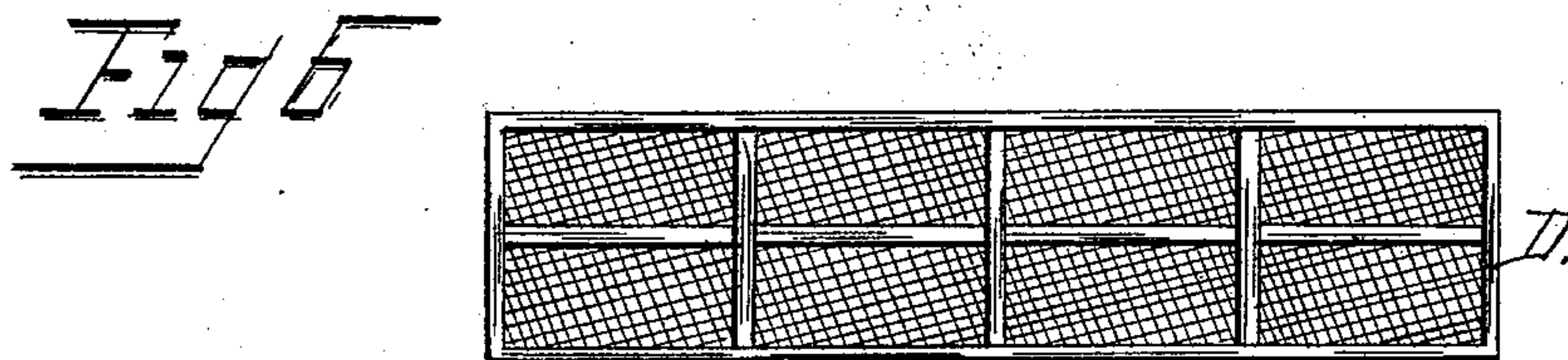
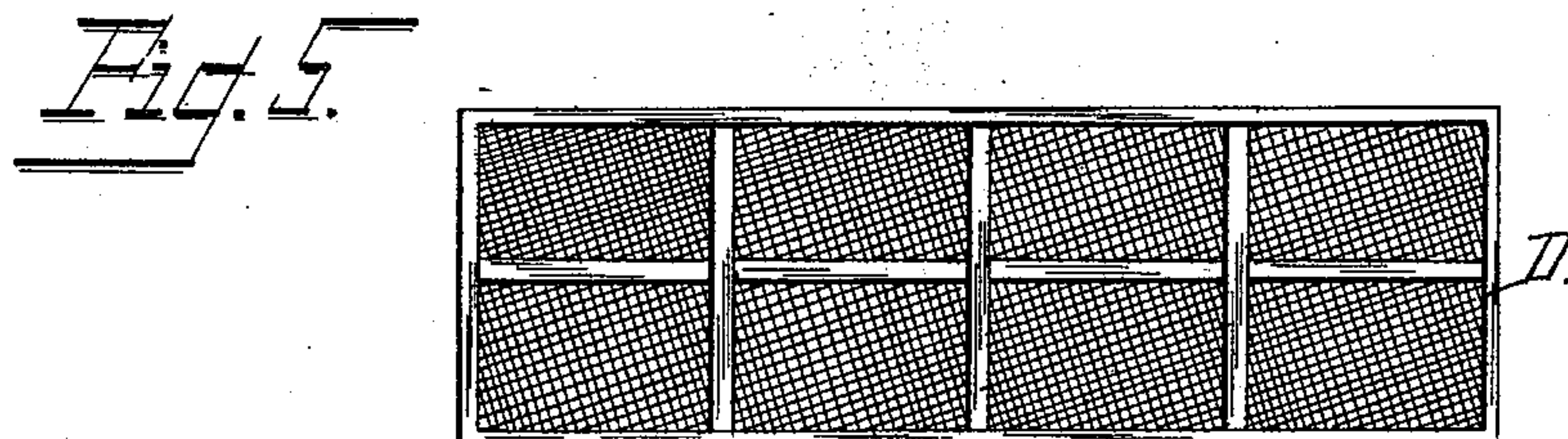
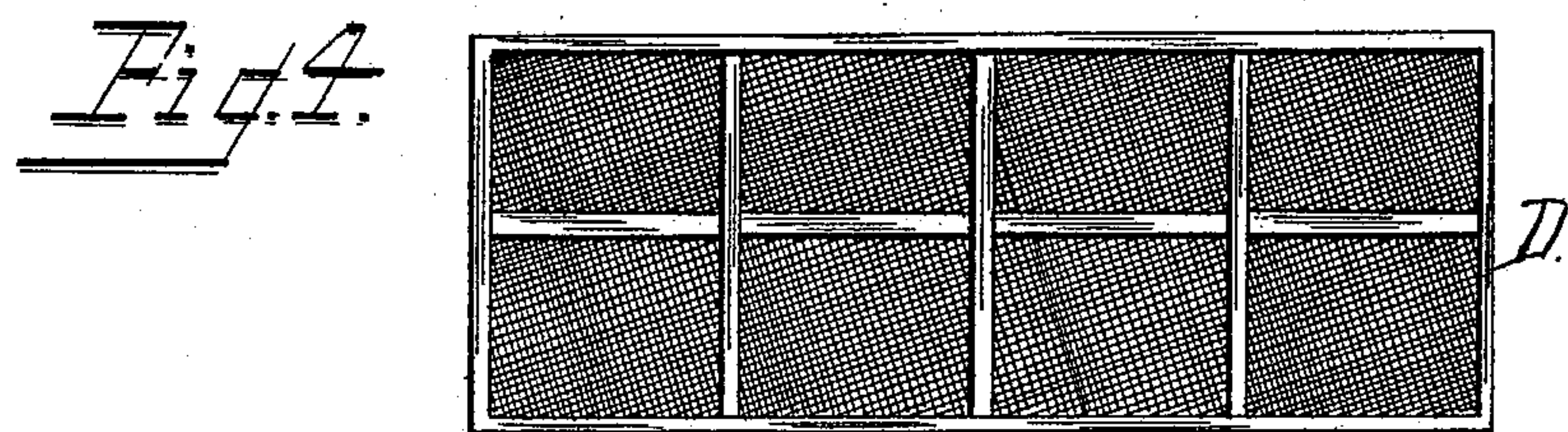
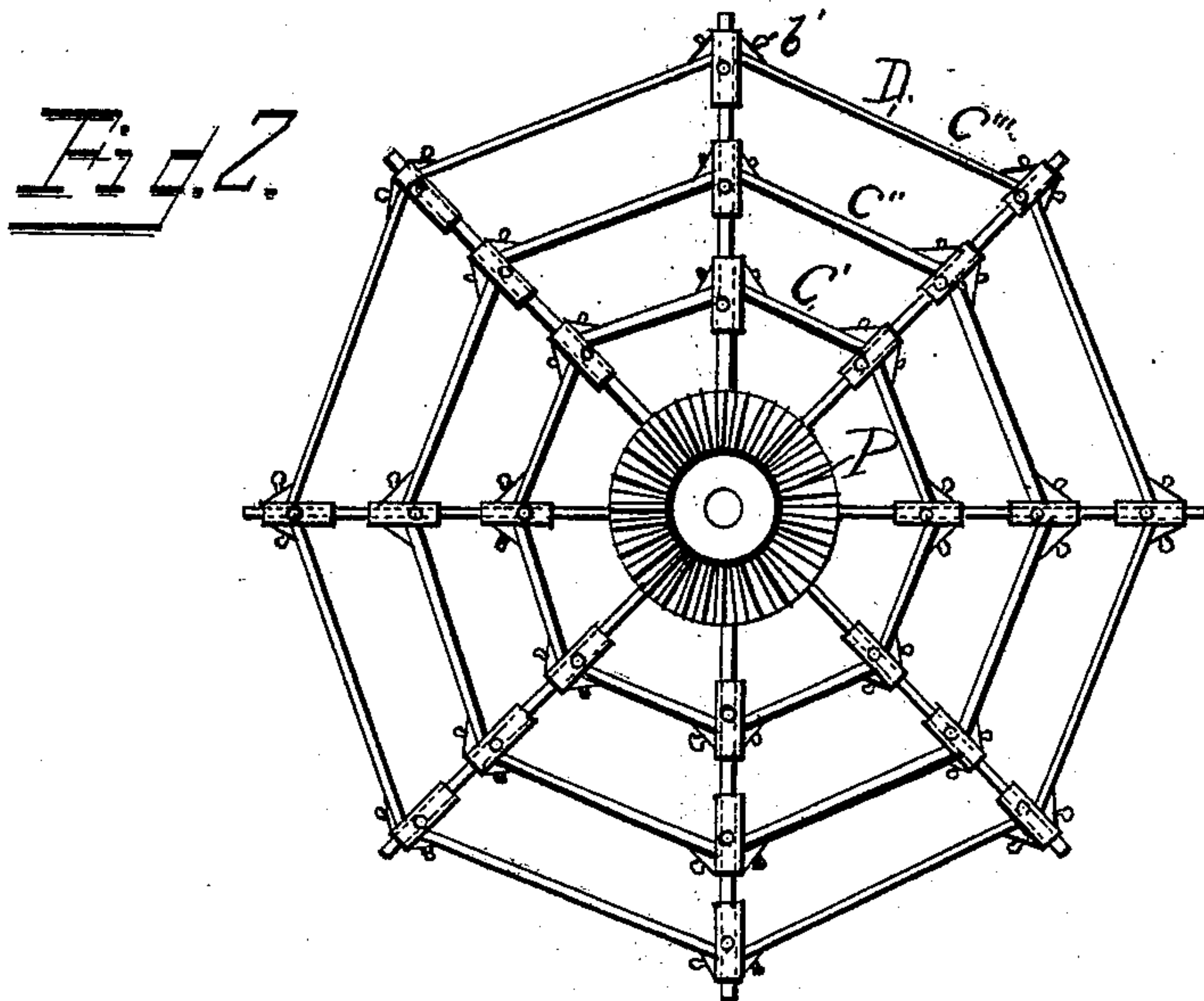
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WITNESSES

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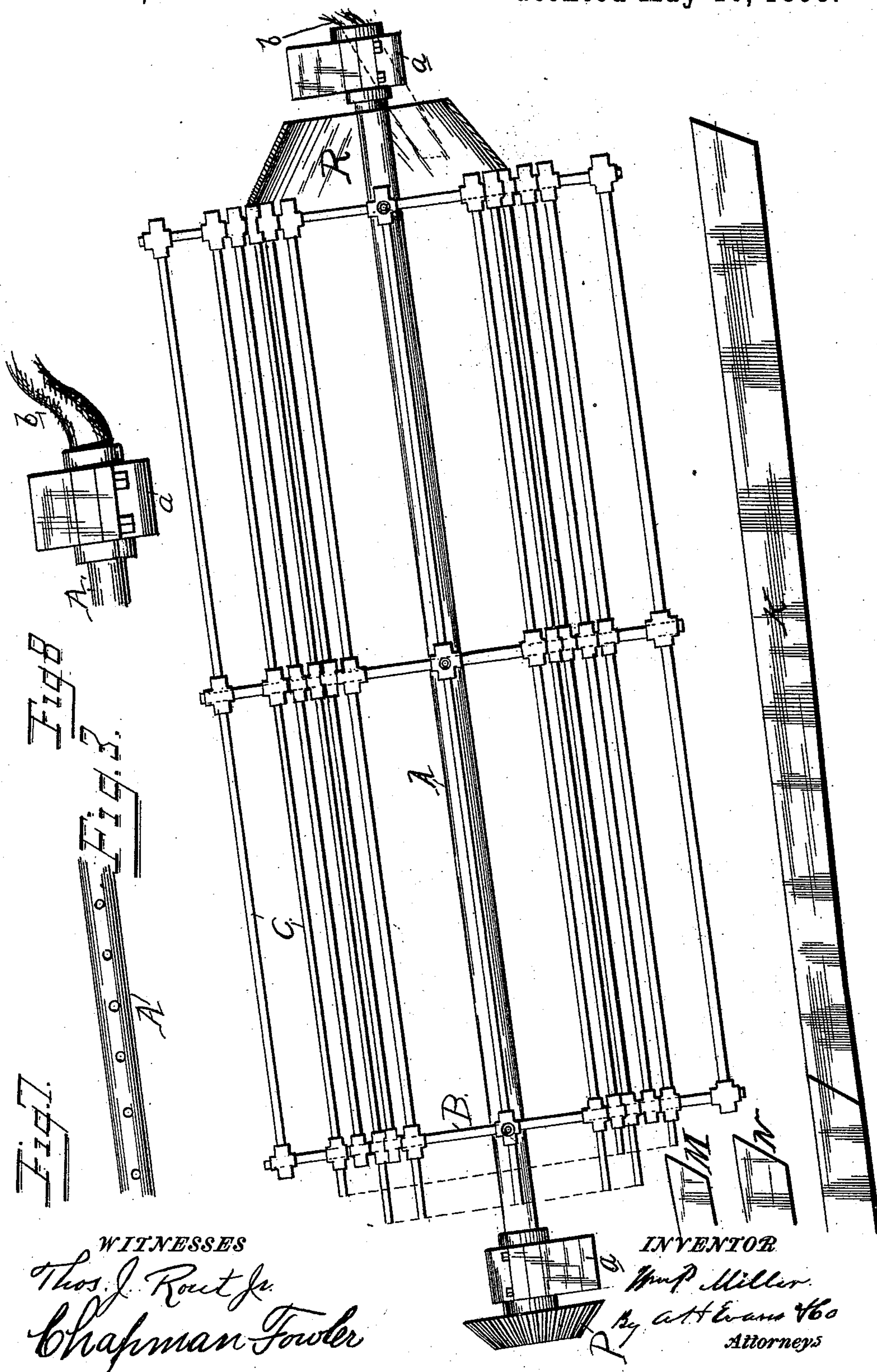
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3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

WILLIAM PENN MILLER, OF REDDING, CALIFORNIA.

## ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 497,474, dated May 16, 1893.

Application filed December 10, 1892. Serial No. 454,745. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM PENN MILLER, a citizen of the United States, residing at Redding, in the county of Shasta and State of California, have invented certain new and useful Improvements in Ore-Separators, as set forth in the accompanying drawings, forming part of this specification, in which—

Figure 1, is a perspective view of a separator embodying my invention. Fig. 2, is an end view of the same. Fig. 3, is a side view with the screen sections removed. Figs. 4, 5 and 6 are plan views of the screen sections. Fig. 7 is an enlarged detail view of one of the water tubes. Fig. 8 is an enlarged detail view of the pipe for supplying water to the tubular shaft A.

My invention relates to means for recovering fine material, especially the precious metals contained in the waters flowing from a reduction works, and my invention consists of the constructions and combinations of devices which I shall hereinafter fully describe and claim.

To enable others skilled in the art to which my invention appertains to make and use the same I will now describe its construction and indicate the manner in which the same is carried out.

In Figs. 1 and 3 I have illustrated my separator or compartment screen S set at an incline so that the material received at the upper or head end of the separator passes through the latter and is finally discharged at the lower end in the manner hereinafter stated.

The separator or screen S herein shown, is of octagonal form and its frame is composed of tubular material, such as gas or water piping, and it comprises in its construction a main shaft A suitably mounted in boxes or bearings *a* and carrying at one end, preferably the lower end, a gear wheel or pinion P to which power is applied in any suitable manner to effect the rotation of the screen. The shaft A is also of tubular form and connects with any suitable source of water supply through the medium of a hose or tube *b*, and said shaft has securely fitted to it at desired points the radially disposed pipes or tubes B whose outer ends are coupled to longitudinally extending tubes C, and whose in-

ner ends are open and communicate with the interior of the shaft A so that clear water supplied to the shaft passes through to the radial arms or tubes B into the tubes C, which latter are perforated throughout their length whereby they discharge currents or jets of water in the manner and for the purpose hereinafter indicated. This construction and arrangement of the tubes form a secure frame work having end heads and one or more intermediate heads.

The longitudinal tubes C are fitted or coupled to the radial tubes in series, herein shown as three, and to these tubes C suitable screen sections D are secured in any well known manner as by set screws or turn-buttons *b'* to divide the separator or screen into compartments of varying dimensions, while preserving throughout the octagonal form of the screen in cross-section, and constituting three separate screening surfaces, *i. e.* and inner screen C', a middle screen C<sup>2</sup>, and an outer screen C<sup>3</sup>.

The screen sections are of different mesh or fineness, and at the inlet or head end of the separator is a funnel-shaped extension R into which is adapted to discharge a sluice or other conduit for conveying the material to be separated to the interior of the separator and upon the inner screen.

The screens before mentioned are of fine wire cloth, the inner screen being of a size finer than the screen usually placed at the discharge of a crushing plant, the middle screen being a size finer than the inner one, while the outer screen is the finest of the series and is of a fineness that permits nothing but the waters and fine muds and slimes to pass through. It is manifest that the degrees of fineness of said screens may be regulated to suit the grade of the material to be screened. The object of the series of screens mentioned is to cause the inner member to separate and carry the coarse sands and material to the outlet at the lower end where they are received into a tank, apron or receptacle M at that point. The finer material which passes through the inner screen is received upon the middle screen, is again screened and separated by the latter, the coarser material, *i. e.* the fine sands &c., which were small enough to pass the inner screen, being carried along the middle



screen to its receiving tank, apron, or receptacle M at the discharge end, and the still finer material, sands, slimes, and sedimentary matter passing through the meshes of the  
 5 outer or finest screen, which is composed of very fine wire cloth or like material, and falls upon said outer screen. Any material of sufficient size to prevent it passing through the  
 10 outer screen is carried along the same to its receiving tank, apron, or receptacle M, while the waters, fine slimes and sediments which pass through the outer screen are received into a tank or receptacle K placed below and  
 15 extending the length of said screen. From this description it will be seen that all of the material which is fine enough to pass through the inner screen with the water, drops upon the  
 20 middle screen, and all that is fine enough to pass the latter screen passes to the outer screen where the final separation occurs, the waters  
 25 and finest slimes finding their way to the tank K, and the coarser material from each screen being received into its own tank at the lower or discharge end of the separator, and  
 30 from thence it may be removed for further treatment by any of the well known methods. While this screening is going on clear water, under pressure, is admitted to the central hollow  
 35 shaft and finding its way to the longitudinal perforated pipes C is discharged therefrom and flowing over the surfaces of the screens, reduces the thick muddy waters carrying the slimes and sedimentary matter, and  
 40 thereby facilitates the washing and freeing of the sands and coarser material from all mud and sediment, and aiding the passage of the muddy waters and fine sedimentary material in their passage through the different  
 45 screens in the several receiving tanks. Thus there is a perfect separation under a continuous flow of the whole mass, the muddy waters going into the tank K and the sands, coarse gangue, and other material being conveyed upon the different screens to be discharged  
 50 at the discharge ends thereof in a comparatively dry condition, free from all adhering fine sedimentary matter.

The screen frames before mentioned are designed to fit and rest upon the longitudinal  
 50 tubes C between adjoining arms and are re-

movably held in place by the turn-buttons or set screws b'. Should any of the different screens become broken or torn the one so injured can, in a few seconds of time, be removed and another inserted; for example  
 55 should any one of the screen sections of the inner screen be injured, the corresponding section of the outer screen is removed (see Fig. 1) by releasing its turn-buttons, then likewise remove the middle screen section when  
 60 access is had to the broken or injured inner section which is replaced by a new section, and the middle and outer sections replaced. It will also be observed that the discharges of  
 65 the different screens project one beyond the other to enable them to discharge into their respective receivers and that rotation is given the separator to facilitate the rapid separation and screening of the material.

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

1. A separator comprising a central tubular shaft to be connected with a source of water supply and having the radially disposed tubes  
 75 connecting with its interior, the longitudinally extending tubes fitted to said arms and provided with perforations or water outlets, and screen-sections detachably fitted on said longitudinal tubes whereby the currents or jets  
 80 of water therefrom are discharged over the surface of the screens to assist the washing of the material thereon.

2. In a separator the central tubular shaft with radial tubes, the longitudinal perforated  
 85 connecting tubes coupled to said radial tubes, superposed screen sections detachably fitted on said connecting tubes and arranged in approximately annular series to form independent concentric screens, means for rotating the  
 90 separator and supplying its central shaft and perforated connecting tubes with water, and supplying material to the innermost screen, and independent receivers for the discharge of each screen.

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Witnesses:

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