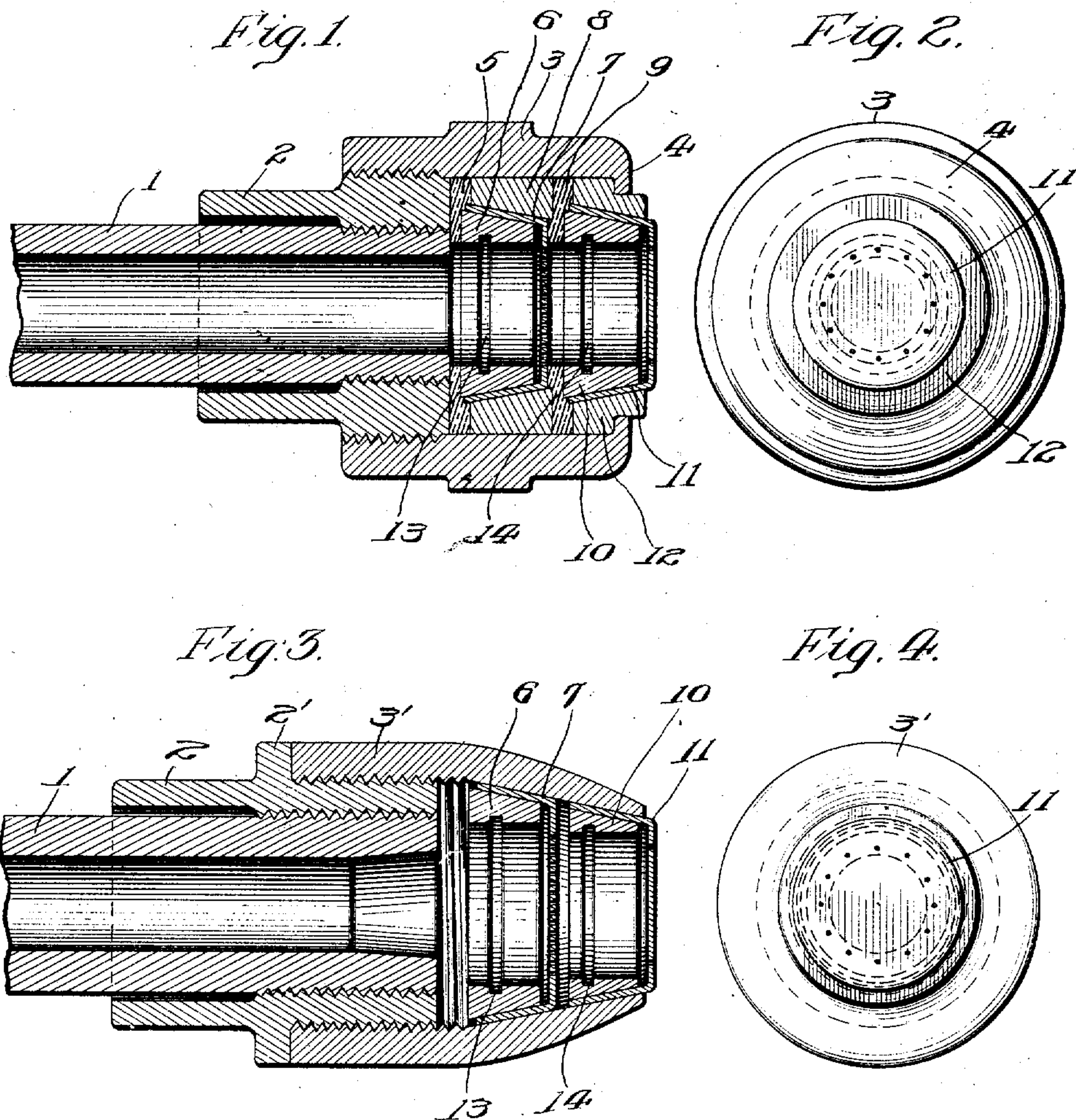


No. 858,648.

PATENTED JULY 2, 1907.

C. A. ERNST.
SPINNING HEAD.
APPLICATION FILED JAN. 16, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 6.

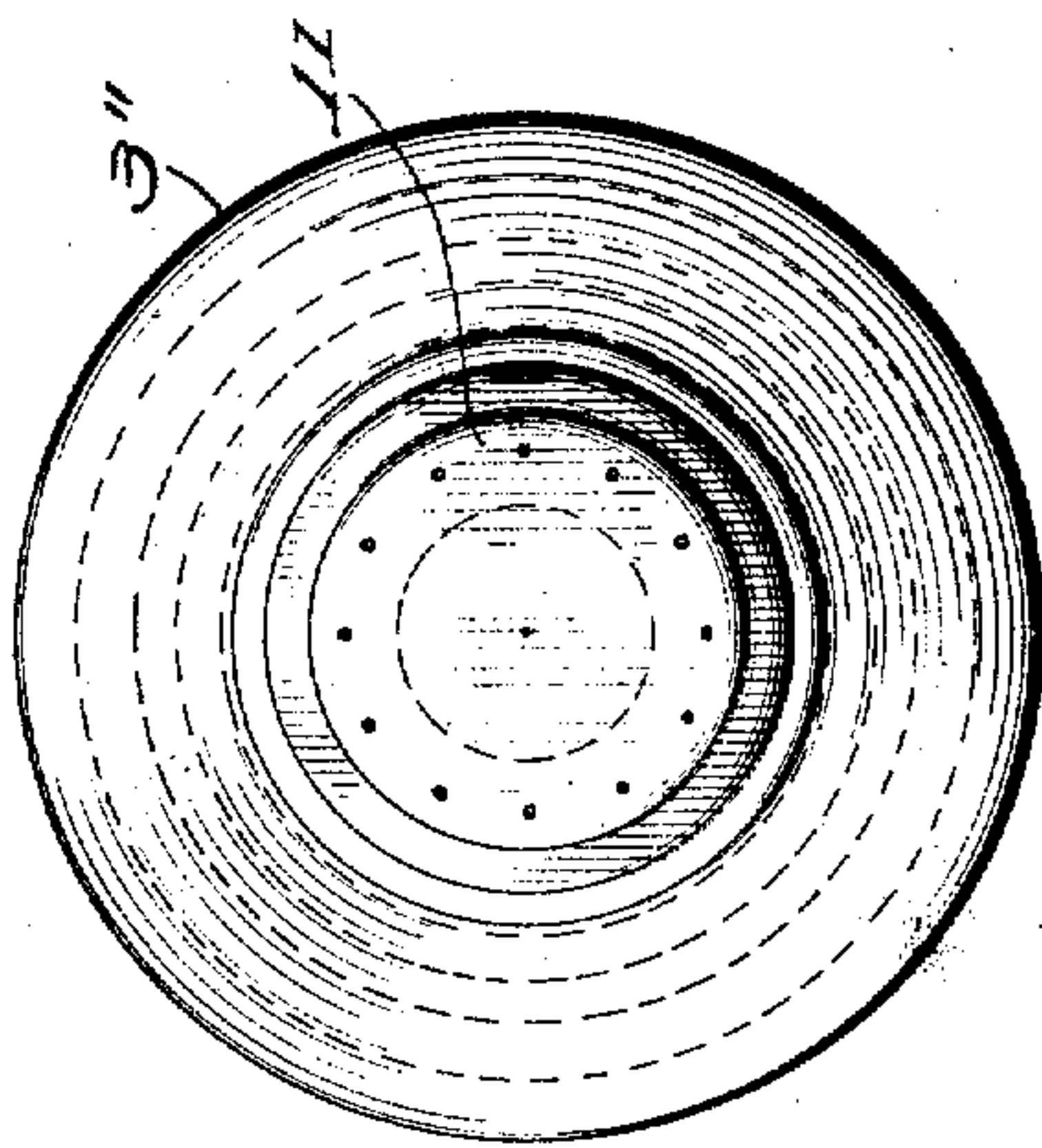
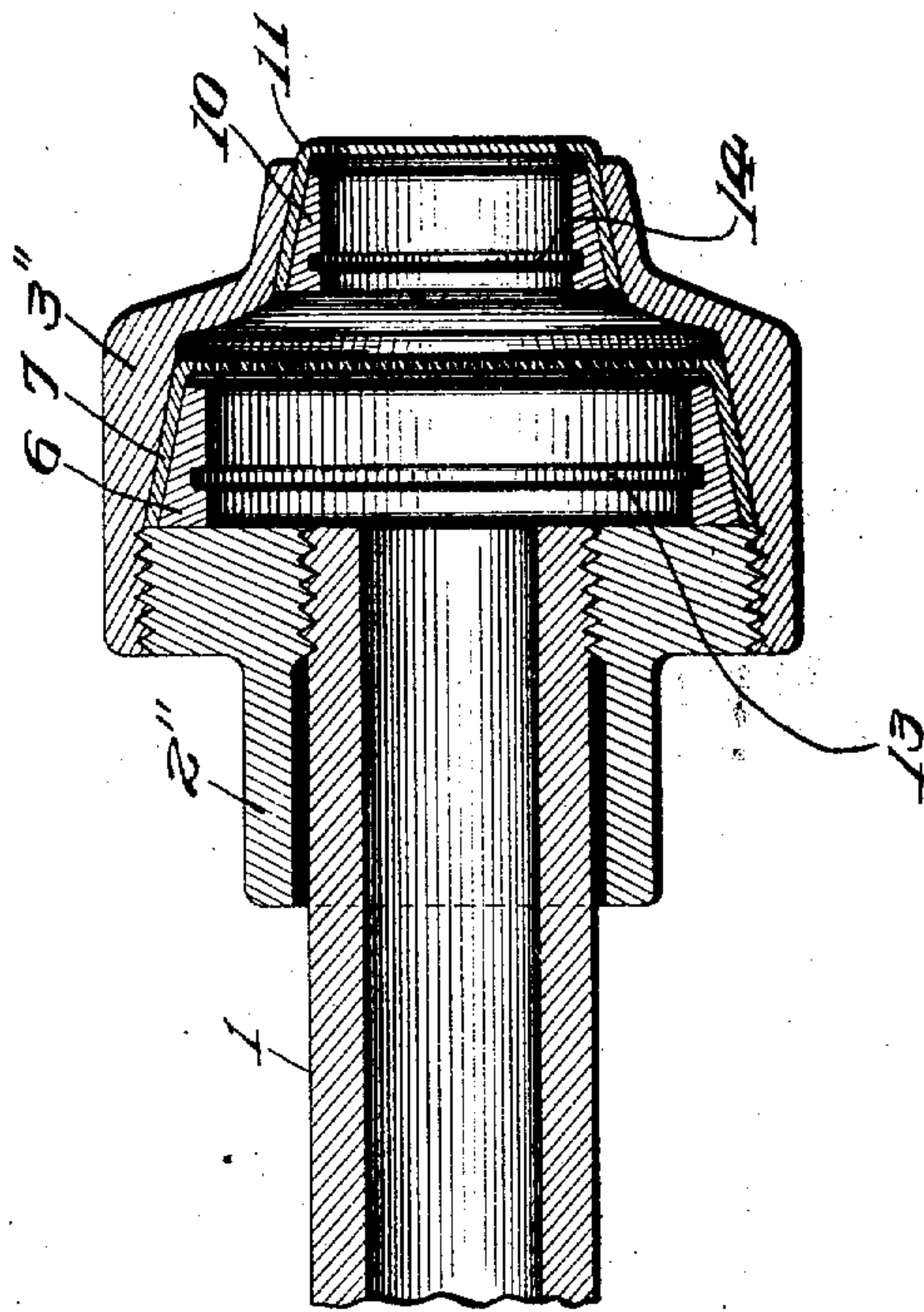


Fig. 5.



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SPINNING-HEAD.

No. 858,848.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed January 15, 1907. Serial No. 352,346.

To all whom it may concern:

Be it known that I, CHARLES A. ERNST, a citizen of the United States, and a resident of Lansdowne, in the county of Delaware, State of Pennsylvania, have invented new and useful Improvements in Spinning-Heads, of which the following is a full, clear, and complete disclosure.

My invention relates to spinning heads and particularly to that class of the same which are utilized for forming filaments of metamorphosed cellulose or similar material in which viscose or a similar viscous material is forced under pressure through a perforated spinneret into a coagulating bath where the viscose filaments are transformed into solid filaments of artificial silk or similar material. Any particles of foreign matter or small clots formed by the decomposition of the viscose would close the minute apertures in the spinneret, thus interfering with the even and uniform flow of the viscose through the same, and unless the material of which the strainer and spinneret are made is chemically resistant to viscose the viscose will decompose, coagulate or clot and the strainer and spinneret will deteriorate.

The object of my invention is to provide a spinning head containing means for arresting the passage of these impurities, the said means being of such material that no chemical transformation will take place by the contact of the viscous fluid with the same or with the perforated spinneret.

A further object of my invention is to make a chemically neutral spinneret and strainer so thin that the small apertures therethrough may be drilled or punched, and at the same time to render the same sufficiently strong to withstand the high pressure to which they are subjected.

A further object of my invention is to provide a construction in which the expensive platinum spinnerets and strainers may be dispensed with without impairing the quality of the thread produced thereby. I accomplish this by substituting for the same a spinneret and strainer made of hard rubber or other material which is sufficiently strong to withstand the requisite high pressure and at the same time is chemically neutral or resistant to viscose.

A further object of my invention is to provide a spinneret of such a configuration that the greater the pressure of the viscous fluid, the more securely the spinneret will be held in position, and also to provide a thin spinneret of such a configuration that when in position it will withstand the pressure of the viscous fluid without being substantially distorted.

Other objects of my invention will appear in the specifications and claims below.

For a full, clear and complete disclosure of my invention reference may be had to the following description and accompanying drawings in which like reference characters refer to corresponding parts.

In the drawings, Figure 1, is a longitudinal section of one of the forms of my invention; Fig. 2, an end view thereof; Figs. 3 and 5, are longitudinal sections respectively of modifications of my invention, Figs. 4 and 6, end views thereof. All the views are on a greatly enlarged scale.

Referring to Figs. 1 and 2, 1 is the tube or pipe to the end of which is screwed the spinning head which consists of the bushing 2 screwed to the outer end of said pipe and having screwed to its exterior a coupling 3 having its outer end turned inwardly to form a circular flange 4. Within the coupling 3 and around the end portions of the head 1 and bushing 2 is a rubber washer 5 on which rests a ring 6 having a tapered exterior portion over which is placed the flange of the strainer 7. Over the flange of the strainer is placed a similar ring 8 having its exterior surface of the same diameter as the inner portion of the coupling and its interior surface tapered to conform with the taper of the flange of the strainer 7 and the outside surface of the ring 6. Around the periphery of the strainer 7 and against the end of the ring 8 is another rubber washer 9 against which is placed a ring 10 of like construction to the ring 6 and over which is placed a spinneret 11 having a conical flange like that of the strainer 7. Over the conical flange of the spinneret 11 is placed a ring 12 having the interior surface tapered to conform with the taper of the flange of the spinneret 11 and its exterior surface stepped to conform with the interior surface of the coupling 3 and its flange 4, the said flange acting to hold the ring 12 within the coupling. Within the interior of the rings 6 and 10 are circumferential grooves 13 and 14 for the engagement of a tool inserted into the end of the coupling. By the construction just described it will readily appear that the strainer 7 and the spinneret 11 are securely clamped in position by screwing down the coupling 3 of the screw heads of the collar 2 which movement forces the ring 12 downwardly causing the wedging action between the successive flanges and rings, a separate yielding resistance being given to each of the same by the rubber packing washers 5 and 9, respectively. The strainer and the spinneret are molded or otherwise shaped out of thin hard rubber which is chemically resistant to the viscous fluid.

Heretofore in the art it has sometimes been the custom to utilize platinum strainers and spinnerets due to the resistant chemical qualities of platinum. In utilizing hard rubber, however, it is obvious that the cost is reduced many fold and at the same time the spinnerets may be made thin enough to enable the minute-like perforations to be drilled therein, having predetermined and uniform diameters, I have found that spinnerets and strainers made of thin hard rubber or similar material are sufficiently strong to withstand the great pressure of the viscous fluid without becoming distorted. The thin hard rubber spinneret and strainer, flanged as illustrated and described, will act to secure themselves more firmly in position in the spinning head by virtue of the heavy pressure of the viscous fluid against their inner faces, causing the same to be put under tension, which tension is transferred to the flanges, thus tightening the same against the tapering interior surface of the rings 8 and 12, respectively.

Referring to Figs. 3 and 4, the bushing 2 has an annular projection 2' against which rests the inner end of the coupling 3'. In this modification the inner wall 15 of the coupling is tapered to conform with the conically flanged portion of the strainer 7 and the spinneret 11, thus eliminating the necessity for the rings 8 and 12 respectively as shown in Fig. 1. The packing rings or washers may be dispensed with in this modification since the inner ends of the rings 6 and 10 present a surface against which the viscous fluid may act under pressure. By virtue of this latter construction the viscous fluid not only causes the strainer and spinneret to clamp themselves more securely in position, as described in Fig. 1, but causes an additional clamping action by forcing the rings 6 and 10 respectively, further into the flanges.

In the modification illustrated in Figs. 5 and 6, I have provided a structure in which the strainer may be made considerably larger than that illustrated in the preceding figures. In this case the coupling 3'' is enlarged at its inner end and fitted over the large bushing 2''. On account of this construction the strainer might not reduce the pressure of the viscose between the strainer and the spinneret sufficiently to dispense with mechanical means for holding the strainer tightly against the inner tapering surface of the coupling 3'' of the spinning head. I therefore prefer to screw the bushing 2'' down against the inner ends of the ring 6 and strainer 7 to force the flange of the strainer tightly against the inner tapering wall of the coupling. Under such conditions, however, even with this construction the spinneret might be held in its proper position by the pressure of the viscose alone as has been heretofore explained.

From the above description it will be apparent that I have provided a structure in which both the strainer and the spinneret may be made of very light or thin material which can be drilled or punched to provide them with suitable perforations; but at the same time the same are so mounted within the spinning head that they are prevented from collapsing or varying substantially from their original form, notwithstanding the high pressure to which they are subjected and the tendency of the viscose to force the same outwardly through the contracted opening in the end of the head.

It is of course to be understood that in order to pre-

vent the clogs of particles of foreign matter from reaching the spinneret the holes or perforations in the strainer must necessarily be slightly smaller than those in the spinneret.

Having thus described my invention what I claim and desire to protect by Letters Patent of the United States is:—

1. In a device for forming filaments of metamorphosed cellulose, a head provided with an opening, a flexible spinneret arranged across said opening and provided with a flange larger than said opening, and separate means within said spinneret to prevent the spinneret from being forced through said opening by the pressure of the viscous fluid.

2. In a device for forming filaments of metamorphosed cellulose a head provided with an opening, a thin, flexible cup-shaped spinneret mounted within said head and extending across said opening, the same being secured to said head by the pressure of the viscous fluid, and separate means within said spinneret to prevent said spinneret from collapsing.

3. In a machine for forming filaments of metamorphosed cellulose, a head, a thin, flexible cup-shaped perforated body made of thin material, and separate means within said head to cause said body to preserve its shape irrespective of the pressure to which it is subjected, said head being provided with a surface against which said spinneret is held by the pressure of the viscous fluid.

4. A head and a thin, flexible spinneret, having a conical flange, the said flange being secured to said head and separate means within said head for preventing the spinneret from collapsing under the pressure of the viscous fluid.

5. A head and a strainer confined within said head, and a spinneret having a conical flange, the said flange being secured to said head.

6. A head, a conical ring arranged within said head, and a thin, flexible spinneret having a conical flange, the said flange being secured to said head by said conical ring.

7. A head, a strainer confined within said head, a thin, flexible spinneret having a conical flange arranged within said head, upon said strainer and a conical ring mounted within said spinneret, the said flange of said spinneret being secured to said head by said ring.

8. A head, a strainer having a conical flange arranged within said head, a conical ring mounted within said strainer, a spinneret having a conical flange and mounted in said head beyond said strainer, a second conical ring mounted within said spinneret and the said rings acting to secure the flange of said spinneret and strainer respectively in position.

9. A head having a tapered interior wall at its outer end, a thin, flexible spinneret having a conical flange and means for securing said flange to the inner wall of said head.

10. A head having a tapered interior wall at its outer end, a spinneret having a conical flange, a strainer having a conical flange and means for securing said flanges in position respectively.

11. A head having a tapered interior wall at its outer end, a tapered ring arranged within said head and a spinneret having a conical flange fitting over said ring and means for wedging said ring into said flange.

12. A head having a tapered interior wall at its outer end, a tapered ring confined within said head, a strainer having a conical flange fitting over said tapered ring, another tapered ring arranged beyond said strainer and a spinneret having a conical flange fitting over the last mentioned ring and means for wedging said rings into the respective flanges of the strainer and the spinneret.

13. A head having a tapered interior wall at its outer end, a tapered ring within said head, and a conically flanged spinneret fitting over said ring, the rear end of said ring being so arranged as to present a resisting surface against viscous material under high pressure.

14. A head, a spinneret having a conical flange made of thin flexible material and a wedging element within the

spinneret, the said flange being secured to the said head by the pressure of the viscous fluid upon said spinneret.

15. In a device for forming filaments of metamorphosed cellulose, a head having a tapering surface within the same and a spinneret having a tapering flange, and a tapering element within said spinneret between which and said head said flange is wedged by the pressure of the viscous fluid.

16. In a device for forming filaments of metamorphosed cellulose, a head comprising a pipe, a coupling fixed over

the extremity of said pipe, a spinneret having a conical flange made of thin material, the said flange being secured to said head by the pressure of the viscous fluid upon said spinneret.

In witness whereof I have hereunto set my hand this 15
12th day of January, 1907.

CHARLES A. ERNST.

Witnesses:

ALSTON B. MOULTON,
ALEXANDER PARK.