March 12, 1935. M. E. WILLS 1,993,816

APPARATUS FOR MAKING RAYON

Filed Sept. 30, 1931 2 Sheets-Sheet 1

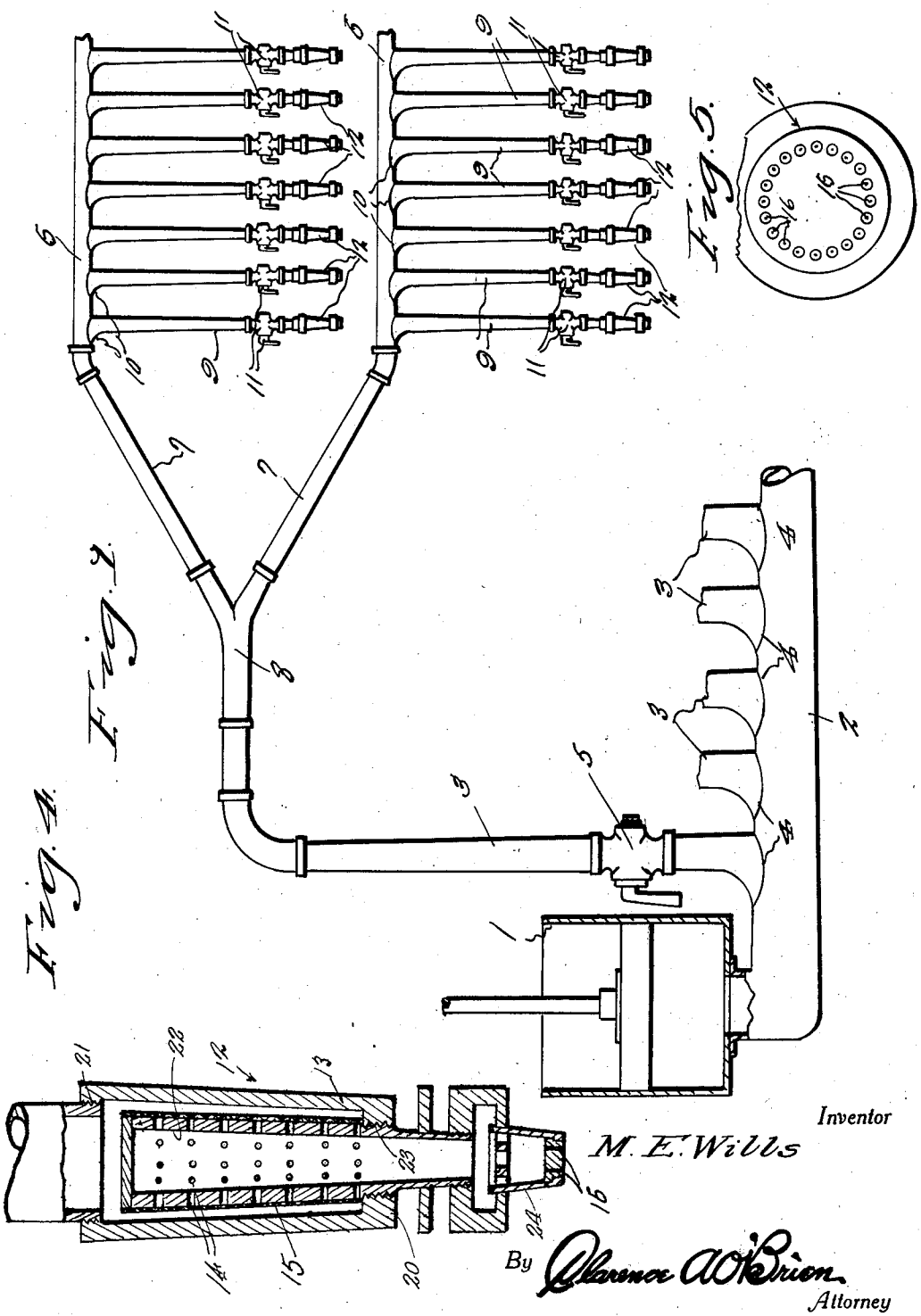


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Inventor

M. E. Wills

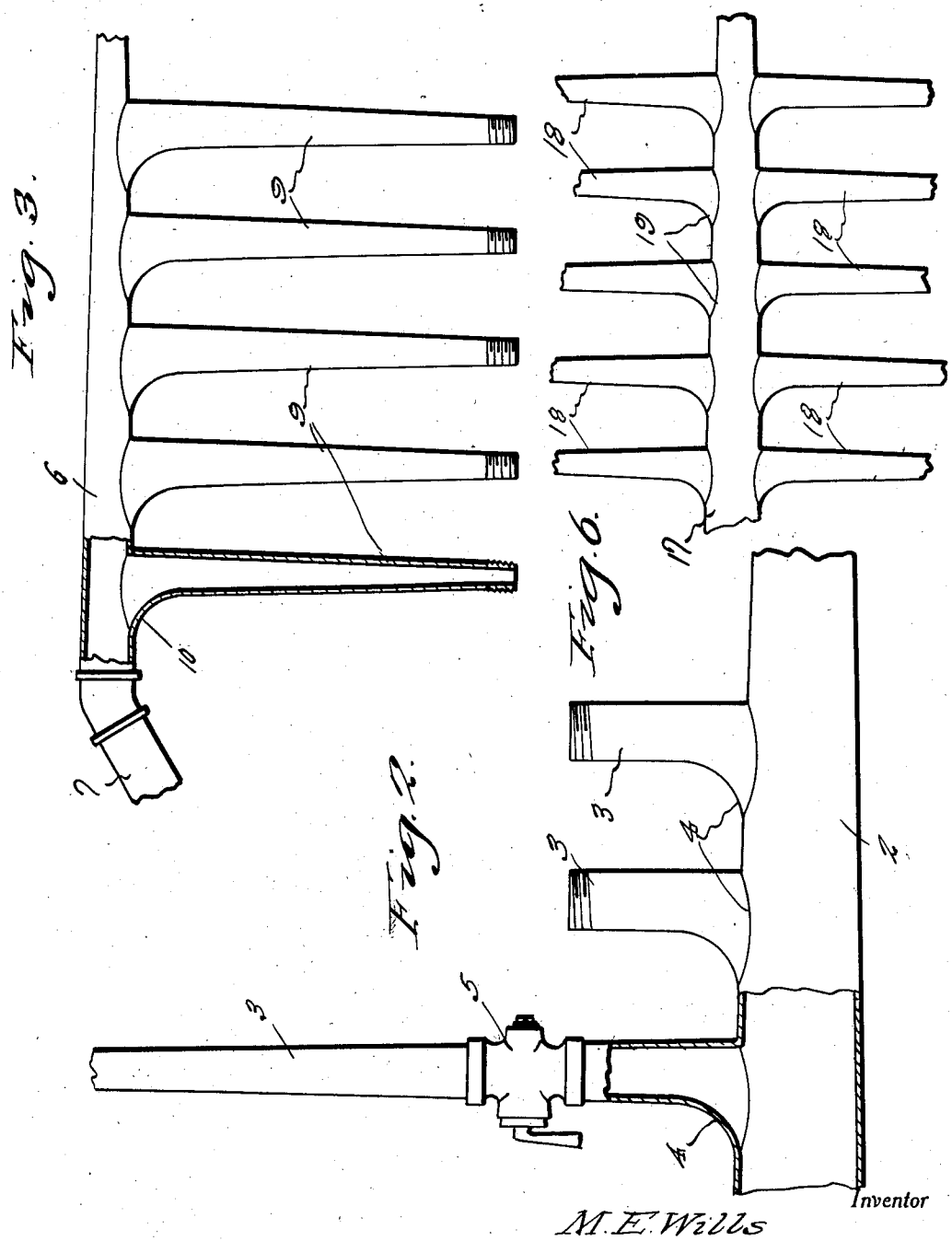
By Clarence O'Brien

Attorney

March 12, 1935. M. E. WILLS 1,993,816

APPARATUS FOR MAKING RAYON

Filed Sept. 30, 1931 2 Sheets-Sheet 2



Patented Mar. 12, 1935 1,993,816

UNITED STATES PATENT OFFICE

1,993,816

APPARATUS FOR MAKING RAYON

Milton E. Wills, Petersburg, Va.

Application September 30, 1931, Serial No. 566,101

1 Claim. (Cl. 18—8))

The present invention relates to the manufacture of artificial silk or rayon and has for one of its important objects to provide, in a manner as hereinafter set forth, an apparatus for accomplishing the foregoing embodying a novel construction and arrangement whereby the solution will be discharged at an equal pressure through all of the capillaries of the nozzles and this without the necessity for using numerous pumps in the lines.

Another important object of the invention is to provide novel conduits for carrying the solution from the press to the nozzles, said conduits embodying a construction whereby adhesion or collection of the solution on the walls thereof will be substantially eliminated.

Other objects of the invention are to provide an apparatus of the aforementioned character which will be simple in construction, strong, durable, efficient and reliable in operation and which may be manufactured and installed at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:—

Figure 1 is a view principally in elevation and partially in section of an embodiment of the invention.

Figure 2 is a view partially in side elevation and partially in section showing the connection of the branches with the main solution line.

Figure 3 is a view of one of the manifolds.

Figure 4 is a detail view in longitudinal section through one of the nozzles.

Figure 5 is a view in elevation looking at the discharge end of one of the nozzles.

Figure 6 is a fragmentary view showing a portion of another form of manifold.

Referring now to the drawings in detail, it will be seen that the reference numeral 1 designates a press for the reception of the solution, said press being of conventional construction and comprising a cylinder in which is reciprocable and ejecting piston. Extending from the press 1 is a main solution line 2 of any suitable length which is connected with the press at one end for receiving the solution therefrom. The main line or pipe 2 is tapered throughout its length from the press 1 to the end thereof which is remote from said press. The large end of said main pipe being connected with the press.

The reference numeral 3 designates branch pipes which are connected with the main pipe 2 at spaced points by sweep joints 4 which facilitate the passage of the solution into the branches from the main pipe, as will be obvious. Any suitable number of the branches 3 may be provided and the same may be connected with the main pipe in any suitable manner and at any suitable angle. Manually operable control valves 5 are interposed in the branch pipes 3 preferably adjacent the main pipe 2. Also, if desired, suitable filters may be provided in the branch pipes 3. Manifolds 6 are coupled with the branch pipes 3 by the connecting pipes 7 and the Y-joints 8.

Outlet pipes 9 extend laterally from the manifolds 6 and are connected thereto by sweep joints 10 the outlet pipes 9 may be connected in any suitable manner, as by soldering, welding or threading, to the manifolds 6. The reference numeral 11 designates control valves near the free ends of the outlet pipes 9, said valves 11 providing means whereby the pipes 9 may be individually controlled while the valves 5 provide means whereby all of the discharge nozzles to be presently described may be controlled which are connected with each of the branches 3.

Mounted on the discharge ends of the outlet pipes 9 are nozzles which are designated generally by the reference numeral 12. Each nozzle 12 includes a substantially conical casing 13 having a threaded internal flange 20 in its small end. The large end of the casing 13 is internally threaded, as at 21, for connection with one of the outlet pipes 9. Mounted longitudinally in the casing 13 in spaced, concentric relation thereto is a cone 22, the small end portion of which projects from the corresponding end of said casing. The small end of the cone 22 is open and the large end of said cone, which, it will be noted, is within the casing 13, is closed. The portion of the cone 22 which is within the casing 13 is perforated, as at 14. The cone 22 includes an externally threaded intermediate portion 23 which is threadedly connected with the flange 20 for securing said cone in position in the casing 13. Mounted on the cone within the casing 13 is a substantially conical screen 15 which covers the perforations 14. A tip 24 is mounted on the small end of the cone 22, said tip having discharge ports or perforations 16 therein.

It will be noted that all of the elements 2 to 12, inclusive, through which the solution passes after leaving the press 1 are tapered from their inlet ends to the outlet ends thereof. In other

words, the solution passes through pipes or conduits which are tapered from the time it leaves the press until the time when it merges from the nozzles 12. By reason of this construction a substantially equal pressure is maintained at all of the nozzles 12 without the necessity for using pumps in any of the lines and this constitutes the gist of the present invention. In this manner considerable waste of material due to the solution being discharged at varying pressures is eliminated, overheating of the solution is prevented. And uniform consistency of the solution is maintained throughout from press 1 to nozzles 12. The solution first to leave the press will be the first to pass through the nozzles.

In the form of the invention illustrated in Figure 6, the manifold 17 is provided with the oppositely extending outlet pipes 18 which are connected thereto by the sweep joints 19. When this form of machine is used, the Y-joints 8 are eliminated together with one of the connecting pipes 7, as will be apparent.

It is believed that the many advantages of this invention will be readily understood, and although the preferred embodiment of the same is as herein illustrated and described, it is to be understood that changes may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:—

In an apparatus for manufacturing rayon and in combination, a main conduit for the solution connected, at one end, to a source of supply, said main conduit progressively decreasing in diameter from said one end to its other end, branch conduits communicating with the main conduit and progressively decreasing in diameter from their inlet ends to their outlet ends, manifolds connected to the outlet ends of the branch conduits for receiving the solution therefrom, said manifolds progressively decreasing in diameter from their inlet ends to their other ends, and tapered discharge branches projecting laterally from the manifolds.

MILTON E. WILLS.