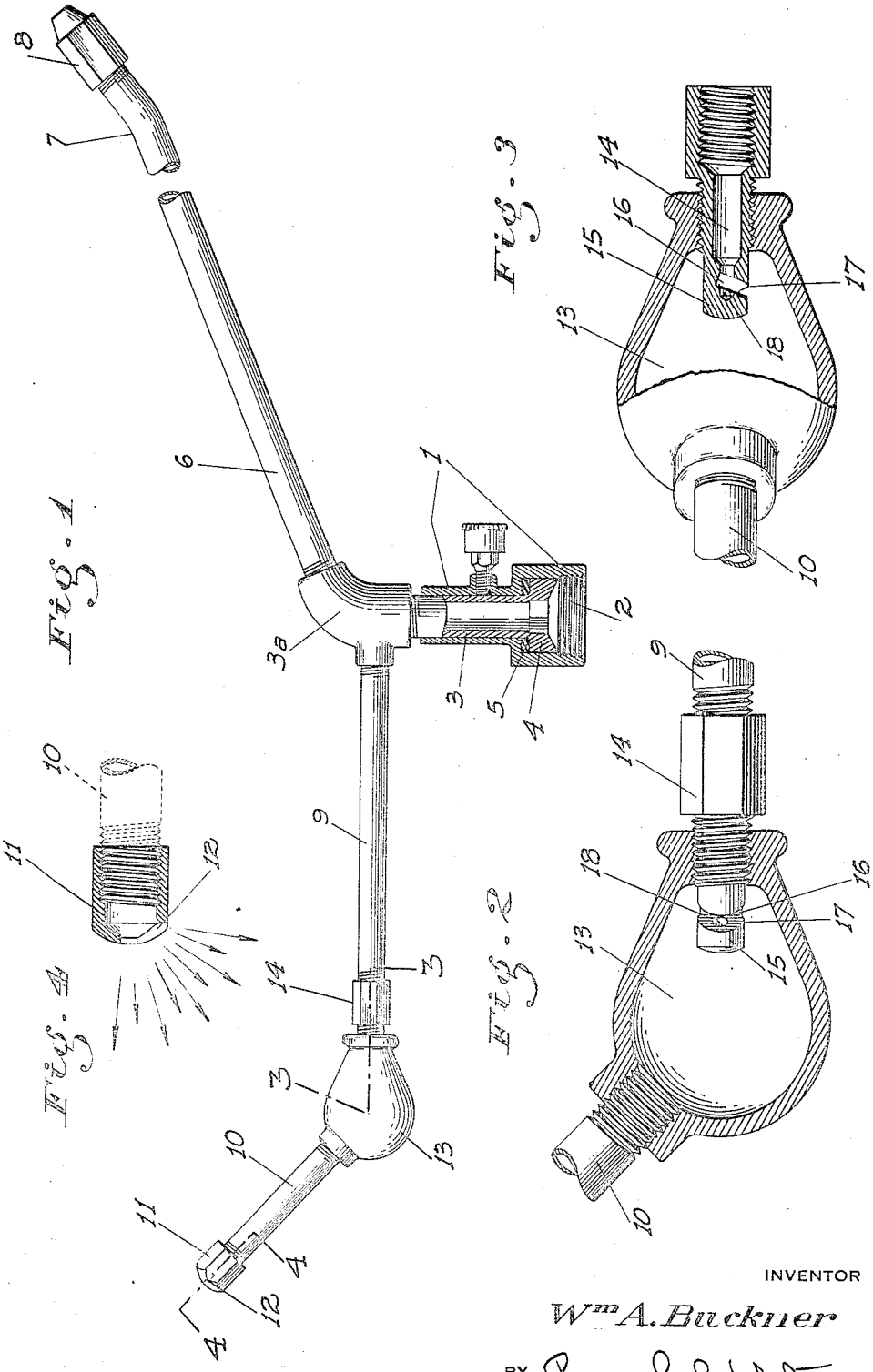
July 11, 1933. W. A. BUCKNER 1,917,632

SPRINKLER

Filed May 20, 1927



INVENTOR

Wm A. Buckner

BY Percy J. Webster

ATTORNEY

Patented July 11, 1933 1,917,632

UNITED STATES PATENT OFFICE

WILLIAM A. BUCKNER, OF FRESNO, CALIFORNIA

SPRINKLER

Application filed May 20, 1927. Serial No. 192,906.

This invention relates to rotating sprinkler heads for use in ground and overhead irrigation sytems. The particular object of the invention is to produce a sprinkler head which will be so constructed as to cause a slow rotation of the head without the necessity of having driving gears or like complicated parts.

Another object of the invention is to produce a head in which a vibrating action in order to keep the head uneasy on its seat may be set up, which vibratory action can be obtained without having any movable and wearing parts. This present invention is particularly designed as improvements over those sprinkler heads shown in my co-pending applications for patent, Serial No. 88,550, filed February 16th, 1926; Serial No. 89,633, filed February 20th, 1926; Serial No. 106,964, filed May 5th, 1926; and Serial No. 136,200, filed September 18th, 1926, in which I show means for setting up vibration and rotation of the head by the action of certain moving parts. Although the sprinkler heads shown in these prior applications for patent give highly satisfactory service, nevertheless the moving parts are subject to more or less wear, and I have therefore devised the present invention to do away with this more or less deleterious effect.

A further object of the invention is to provide a very carefully balanced sprinkler head so that there will be no particular wear on the spindle parts of the head.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of my improved sprinkler head showing the spindle part in section.

Fig. 2 is a vertical section of the pear shaped member and the parts therein.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a sectional view taken on a line 4—4 of Fig. 1.

Referring now more particularly to the characters of reference on the drawing, the numeral 1 designates the spindle cage of the head which is threaded as at 2 so that it may be secured to any desired coupling or source of water supply. Turnable within the cage 1 is the spindle sleeve 3 projecting into the coupling 2 where it is provided with a flange 4 bearing against the usual gasket 5. Secured to the spindle 3 is the rotating head 3*a*. This head is preferably substantially L-shaped. The angle of the L is not a full ninety degrees but is closer to ninety degrees than it is to forty-five degrees, all for a purpose as will be presently explained. The primary discharge pipe arm 6 connects into the upper end of the L-head 3*a*. It is bent slightly upward at its outer end as at 7 to gain the proper elevation and is provided at its outer end with the usual discharge nozzle 8.

Extending at right angles to the vertical axis of the head and communicating therewith is the secondary discharge pipe arm 9 having an outer end 10 bent slightly upward and provided with a discharge nozzle 11 having a reactionary discharge slit 12. This slit 12 as is clearly shown in Fig. 4 is cut into one half of the diameter of the curved end of the nozzle 11 which would cause the water emanating therefrom to discharge in a substantially V-shaped stream as shown by the arrows in Fig. 4.

A substantially pear shaped casing 13 is interposed between and has communication with the pipe 9 and its extension 10. At the point of discharge of the pipe 9 into this casing is a peculiar Venturi nozzle and discharge tip which I will now describe in detail.

A Venturi nozzle 14 discharges directly from the arm 9. At the end of this nozzle 14 and within the pear shaped casing 13 is a tip 15 having a slit 16 cut therein forming a deflecting surface 17 in the path of the discharge from the Venturi nozzle 14. A hole 18 is drilled in the face of the deflecting surface 17 in direct alinement with the discharge nozzle. In practice the slit 16 is positioned to discharge into the casing 13.

The water discharging through the Venturi nozzle strikes a volume of water accumulated in the pocket 18. The water in

the pocket 18 being softer than the metal, the discharging stream from the Venturi nozzle tends to bore into this pocket of water instead of striking and immediately sliding off the smooth metal of the deflecting surface 17. This creates a flurry or swirl in the water which sets up a slight vibration of the head sufficient to keep it uneasy on its spindle. If the head was not kept uneasy on its seat by such vibration the pressure of water would cause it to bind to such an extent as to prevent the weak reactionary effect of the discharge of water from the slit 12 from rotating the head.

The purpose of having the L-head as close to a ninety degree angle as possible is to eliminate as much as possible any downward reactance from the discharge of water through the primary nozzle centering at the head, and the structure of the upward bend in the outer end of the pipe 6 causes a downward reactance of the water at that point sufficient to overcome the excess lateral reactance on the head due to the upward thrust of the water moving through the L-shaped head and of more water moving through the primary nozzle pipe than through the secondary nozzle pipe. The position of the parts in this respect are exactly figured out when the sprinkler is built so that the head will be well balanced with no excessive lateral or downward reactance on any one side of the head which would cause excessive wear on the head spindle.

The water discharged from the primary nozzle 8 covers the greatest radius of the circle to be irrigated, while the V-shaped discharge of water from the slit 12 covers the space between where the water from the nozzle 8 tapers off to the center axis of the sprinkler.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A sprinkler comprising a rotatable head, a discharge pipe connected with the head at an angle to the vertical axis thereof, a reaction means insufficient in itself to impart rotation to the head against the binding of the head on its seat, and means to effect a vibration of the head to render the reaction means effective in rotating the head, such latter means including a member in the pipe interposed against the flow of the water and having a bore in substantial alinement with such flow whereby water moving through the pipe will impinge against the accumulated water within said bore.

2. A sprinkler comprising a rotatable head, a discharge pipe connected with the head at an angle to the vertical axis thereof, a reaction means insufficient in itself to impart rotation to the head against the binding of the head on its seat, and means to effect a vibration of the head to render the reaction means effective in rotating the head, such latter means including a member associated with the pipe and interposed against the flow of the water through said pipe and having a bore in substantial alinement with such flow whereby water moving through the pipe will impinge against the accumulated water within said bore.

In testimony whereof I affix my signature.

WILLIAM A. BUCKNER.