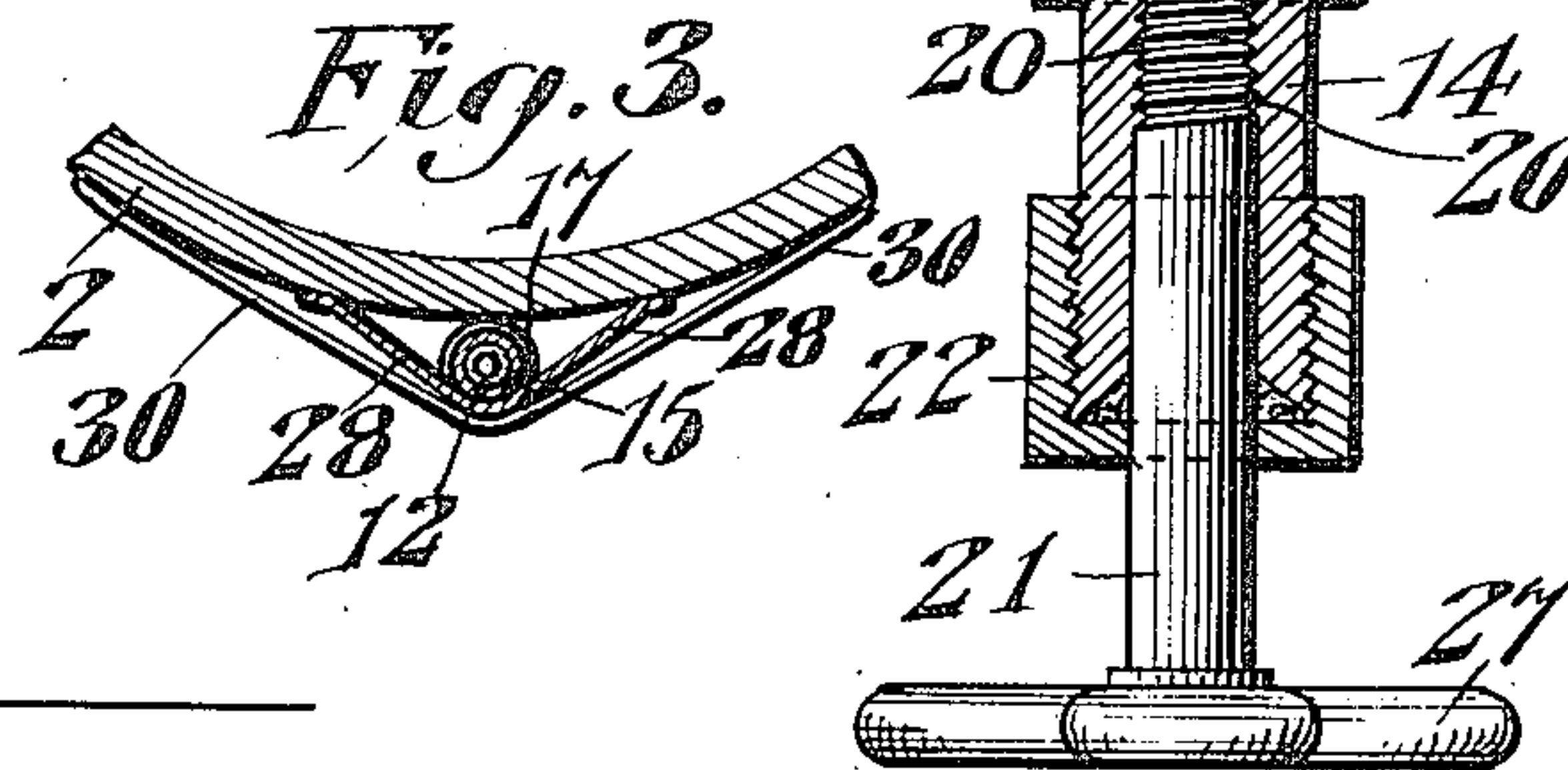
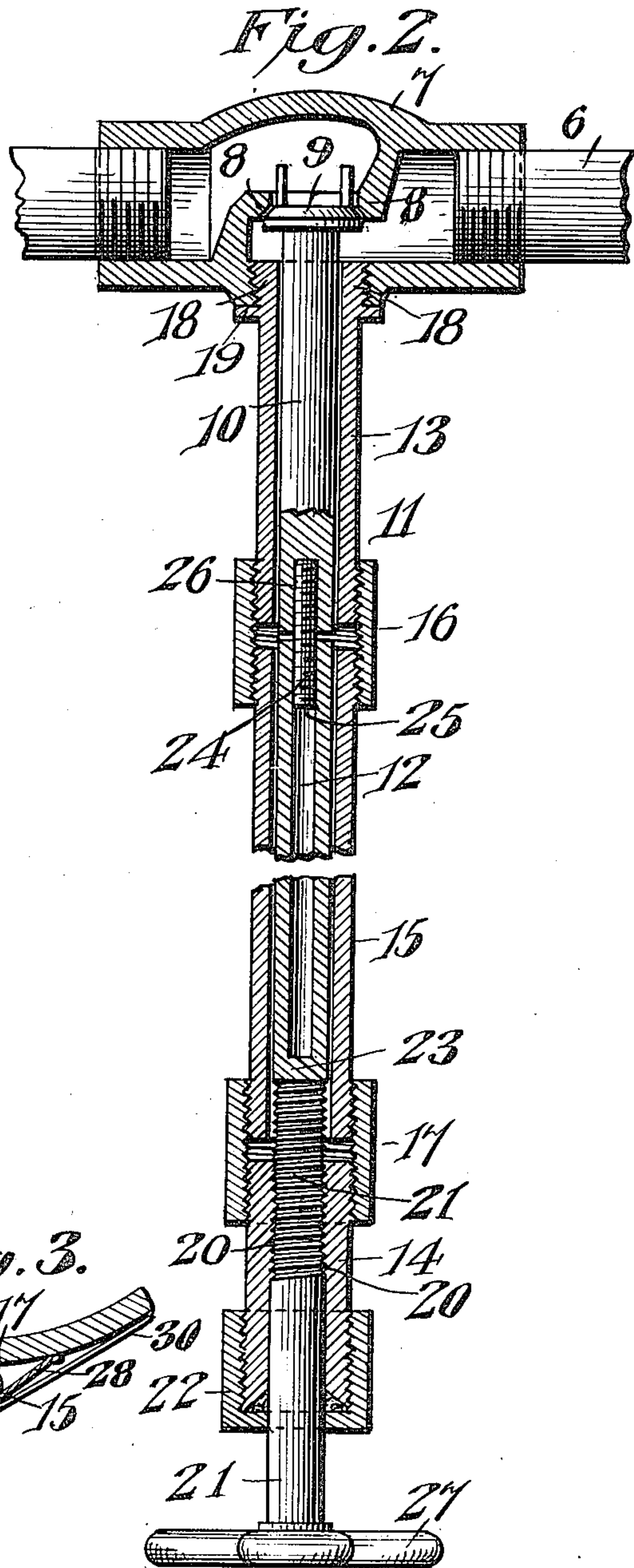
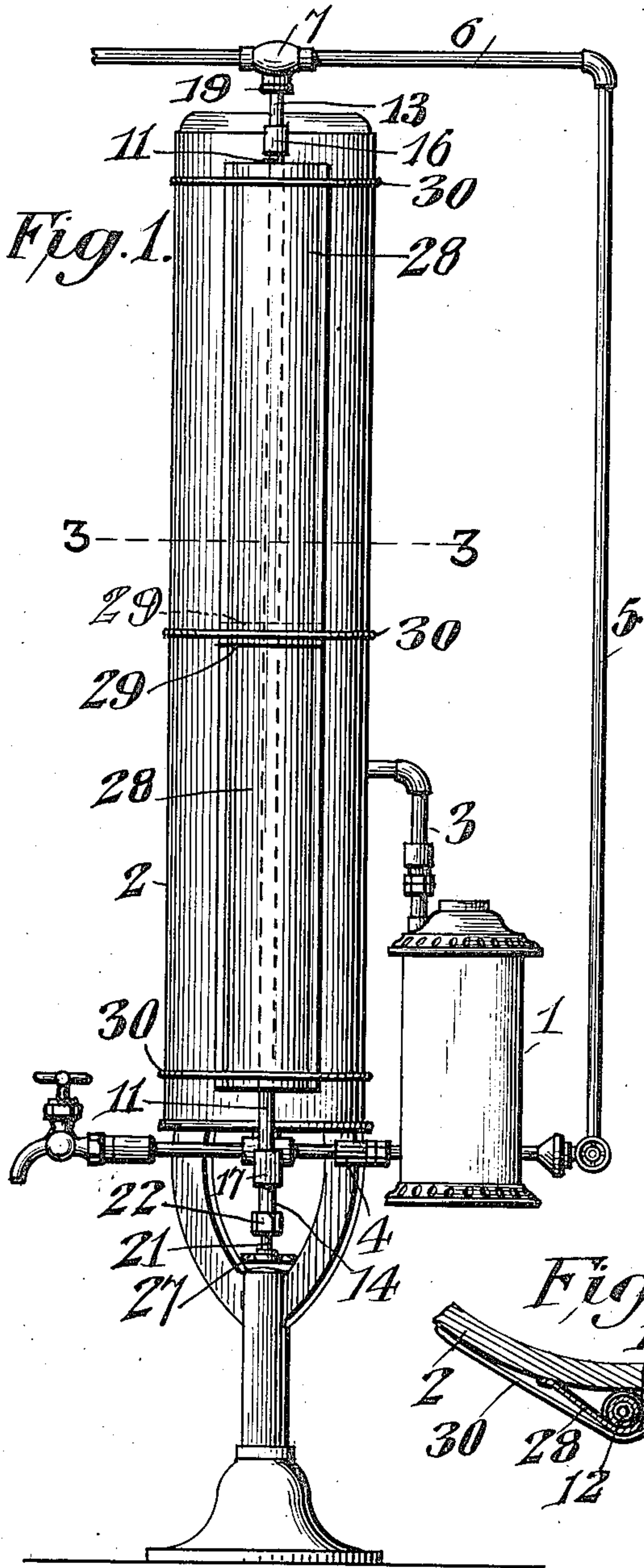


E. P. NOLE.
AUTOMATIC REGULATOR FOR WATER HEATERS.
APPLICATION FILED SEPT. 11, 1909.

953,543.

Patented Mar. 29, 1910.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD P. NOLE, OF NORTH BELLE VERNON, PENNSYLVANIA.

AUTOMATIC REGULATOR FOR WATER-HEATERS.

953,543.

Specification of Letters Patent.

Patented Mar. 29, 1910.

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To all whom it may concern:

Be it known that I, EDWARD P. NOLE, a citizen of the United States, residing at North Belle Vernon, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Automatic Regulator for Water-Heaters, of which the following is a specification.

The invention relates to improvements in automatic regulators for water heaters.

The object of the present invention is to improve the construction of automatic regulators for water heaters, and to provide a simple, inexpensive and efficient device of this character for controlling the flow of gas to a heater, and capable of ready adjustment to vary the flow of gas and of automatically controlling and reducing the same as the temperature of the water rises within the tank or reservoir.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawing, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:—Figure 1 is an elevation of an automatic regulator, constructed in accordance with this invention and shown applied to a tank and a heater. Fig. 2 is an enlarged vertical sectional view, illustrating the construction of the automatic regulator. Fig. 3 is a detail sectional view, taken substantially on the line 3—3 of Fig. 1 and illustrating the construction of the outer casing.

Like numerals of reference designate corresponding parts in all the figures of the drawing.

1 designates a water heater of any preferred construction, arranged adjacent to the lower portion of a tank or reservoir 2 and connected with the same by upper and lower pipe connections 3 and 4, the water from the tank entering the heater at the bottom and flowing from the top of the latter back into the tank or reservoir in the usual manner.

These parts are of the ordinary construction and may be varied to suit the requirements of the particular tank or reservoir, as will be readily understood.

The gas is fed to the heater through a supply pipe 5, having a horizontal portion 6, located slightly above the plane of the top of the tank or reservoir and provided with a valve casing 7, having an interior valve seat 8. The valve casing 7 is of the ordinary construction, and the flow of gas through the same is controlled by a valve 9, located beneath the valve seat and provided with an elongated stem 10, extending downward from the valve casing and located within a vertical pipe 11, which latter forms a tubular casing for the valve stem and for an expansible member 12. The vertical pipe 11 is composed of upper, lower and intermediate sections 13, 14 and 15, having adjacent ends threaded and connected by upper and lower couplings 16 and 17. The number of sections of the vertical pipe 11 may of course be varied, and the upper section 13 has a threaded upper end 18 to screw into the valve casing, and is provided with a flange 19 abutting against the casing and providing a tight joint, as clearly shown in Fig. 2 of the drawing. The bottom section 14 of the vertical pipe is provided with interior screw threads 20 and receives an adjusting screw 21, engaging the screw threads and supporting the expansible member 12 and the valve. The lower end of the vertical pipe 11 is also equipped with a stuffing box 22, which prevents any leakage of gas through the regulator.

The expansible member, which rests upon the adjusting screw, is tubular, its lower end 23 being closed by an integral end wall and its upper end being provided with interior screw threads 24 for engaging a screw 25, having its upper portion arranged in a threaded socket 26 of the lower end of the valve stem 10. The screw 25 adjustably connects the expansible member with the valve stem and provides an adjustment in addition to that afforded by the lower operating and adjusting screw 21. The lower operating screw 21 is provided with a hand wheel 27, or other suitable means for enabling the screw to be turned and when the screw 21 is adjusted, the expansible member and the valve are raised and lowered to vary the flow of gas through the supply pipe.

The tubular casing or pipe 11 is arranged within an outer casing 28, substantially V-shaped in cross section and constructed of sheet metal, or other suitable material and

secured to the exterior of the tank or reservoir 2. The outer casing, which is vertical, extends to within a short distance of the top and bottom of the tank or reservoir, and it is adapted to cover the regulator and keep the same as near the temperature of the tank as possible. While the outer casing 28 may be made in one piece, it is preferably composed of two sections, having their adjacent ends 29 overlapped, as illustrated in Fig. 1 of the drawing. This will enable the sections to be adjusted to vary the length of the outer casing 28. The valve and the casing are secured to the tank by bands 30, constructed of stout wire or other suitable material and preferably arranged at the ends and central portions of the tank. Any number of bands, however, may be employed for this purpose, and other means may be used for supporting the parts in position.

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

1. In a device of the class described, the combination with a tank, and a heater connected with the tank and arranged at the lower portion thereof, of a gas supply pipe provided at the upper portion of the heater with a valve seat, a tubular casing connected with and supported by the supply pipe and fitted against and extending along the exterior of the tank, a valve cooperating with the valve seat and having a depending stem extending into the upper portion of the tubular casing, an expansible member connected with the lower end of the valve stem and located beneath the same and arranged within the tubular casing, and an adjusting screw operating through the lower end of the tubular casing and supporting the expansible member.

2. In a device of the class described, the combination with a tank, and a heater connected with the tank, of a gas supply pipe connected with the heater and having a valve located at the upper portion of the tank, a vertical tubular casing connected with the supply pipe and fitted against the exterior of the tank and extending along the same from the upper to the lower portion thereof, a valve cooperating with the valve seat, an expansible member located within the tubular casing and connected with the valve, an adjusting screw operating through the lower end of the tubular casing and supporting the expansible member, and an outer casing secured to the exterior of the tank and covering the tubular casing.

3. In a device of the class described, the combination with a supply pipe having a valve seat, of a tubular casing connected at its upper end with the supply pipe and supported by the same, a valve cooperating

with the valve seat and having an elongated stem extending into the upper portion of the tubular casing, an expansible member also located within the tubular casing and arranged below the stem, means for adjustably connecting the adjacent ends of the valve stem and the expansible member, and an adjusting screw extending through the lower end of the tubular casing and receiving the lower end of the expansible member and supporting the same.

4. In a device of the class described, the combination with a supply pipe having a valve seat, of a tube connected at its upper end with the supply pipe and extending downwardly therefrom, a valve cooperating with the valve seat and having an elongated stem depending into the upper portion of the tube and provided in its lower end with a threaded socket, a tubular expansible member located within the said tube and having a lower end wall and interiorly threaded at its upper end, a connecting screw extending into the socket of the valve stem and into the threaded upper end of the expansible member, and an adjusting screw operating through the lower end of the tube and engaging the lower end wall of the expansible member and supporting the latter.

5. In a device of the class described, the combination with a tank, and a heater connected with the tank, of a gas supply pipe having a valve seat located at the upper portion of the tank, a tubular casing connected with the supply pipe and fitted against the exterior of the tank and extending along the same, a valve cooperating with the valve seat, an expansible member arranged within the tubular casing and connected with the valve, and an approximately V-shaped casing arranged over the tubular casing and fitted against the same and the tank and secured to the latter.

6. In a device of the class described, the combination with a tank, and a heater connected with the tank, of a gas supply pipe having a valve seat, a tubular casing connected with the supply pipe and arranged contiguous to the tank, a valve cooperating with the valve seat, an expansible member arranged within the tubular casing and connected with the valve, an outer approximately V-shaped casing arranged over the tubular casing and fitted against the same and the tank, and bands encircling the tank and the outer casing and securing the same and the tubular casing to the said tank.

7. In a device of the class described, the combination with a tank, and a heater connected with the tank, of a gas supply pipe having a valve seat, a tubular casing connected with the supply pipe and arranged contiguous to the tank, a valve cooperating with the valve seat, an expansible member

arranged within the tubular casing and connected with the valve, an outer approximately V-shaped casing receiving the tubular casing and fitted against the same and
5 the tank and composed of adjustable overlapped sections, and means for securing the sections to the tank.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDWARD P. NOLE.

Witnesses:

J. R. ATTLEBERGER,

WM. L. MILLER.