No. 886,712. PATENTED MAY 5, 1908.

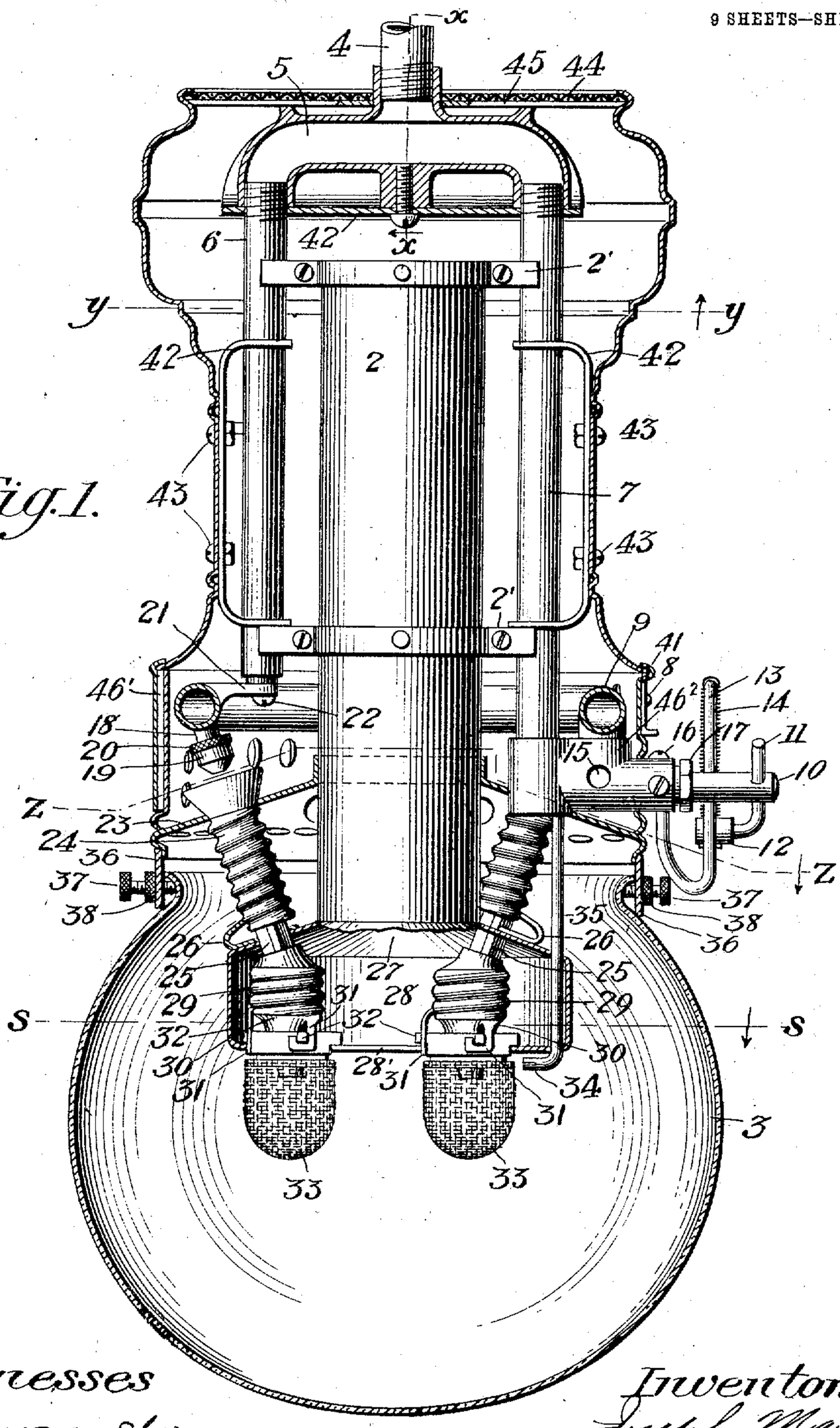
J. MAAS.

GAS LIGHT FIXTURE.

APPLICATION FILED JAN. 29, 1908.

9 SHEETS—SHEET 1.

Fig. 1.



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C. Smith.

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Assts. Attys.

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9 SHEETS—SHEET 2.

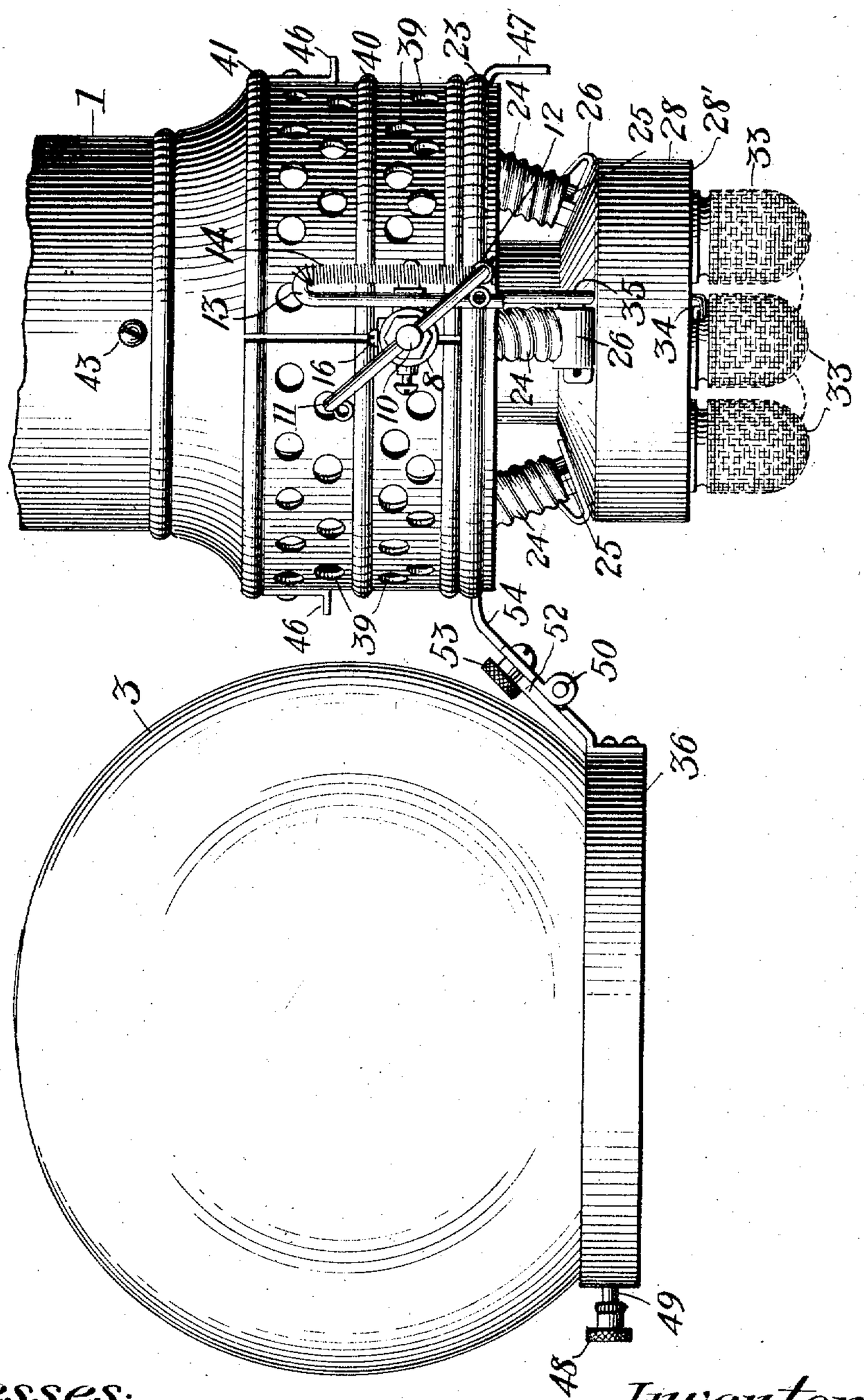

Fig. 2.

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9 SHEETS—SHEET 3.

Fig. 3.

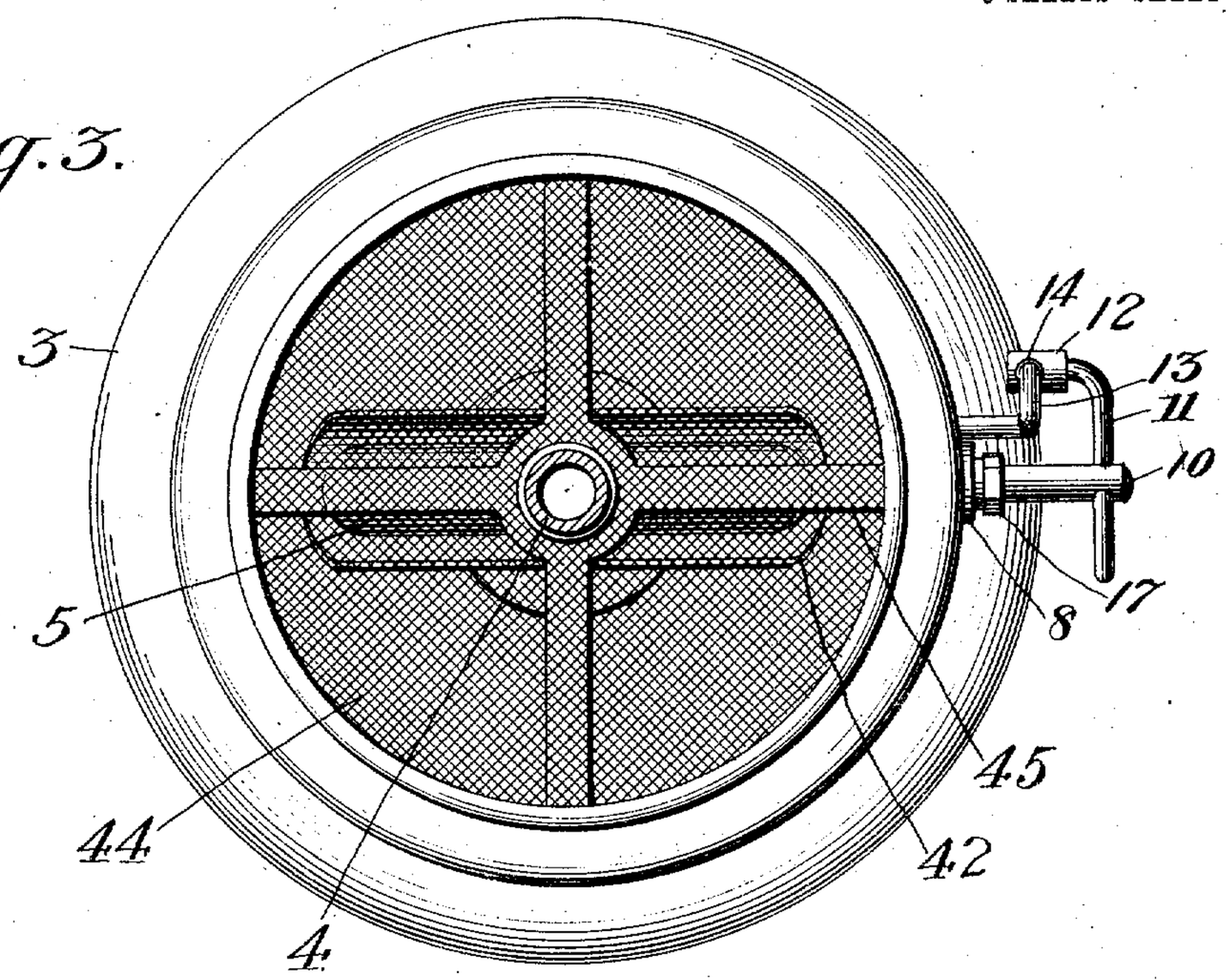
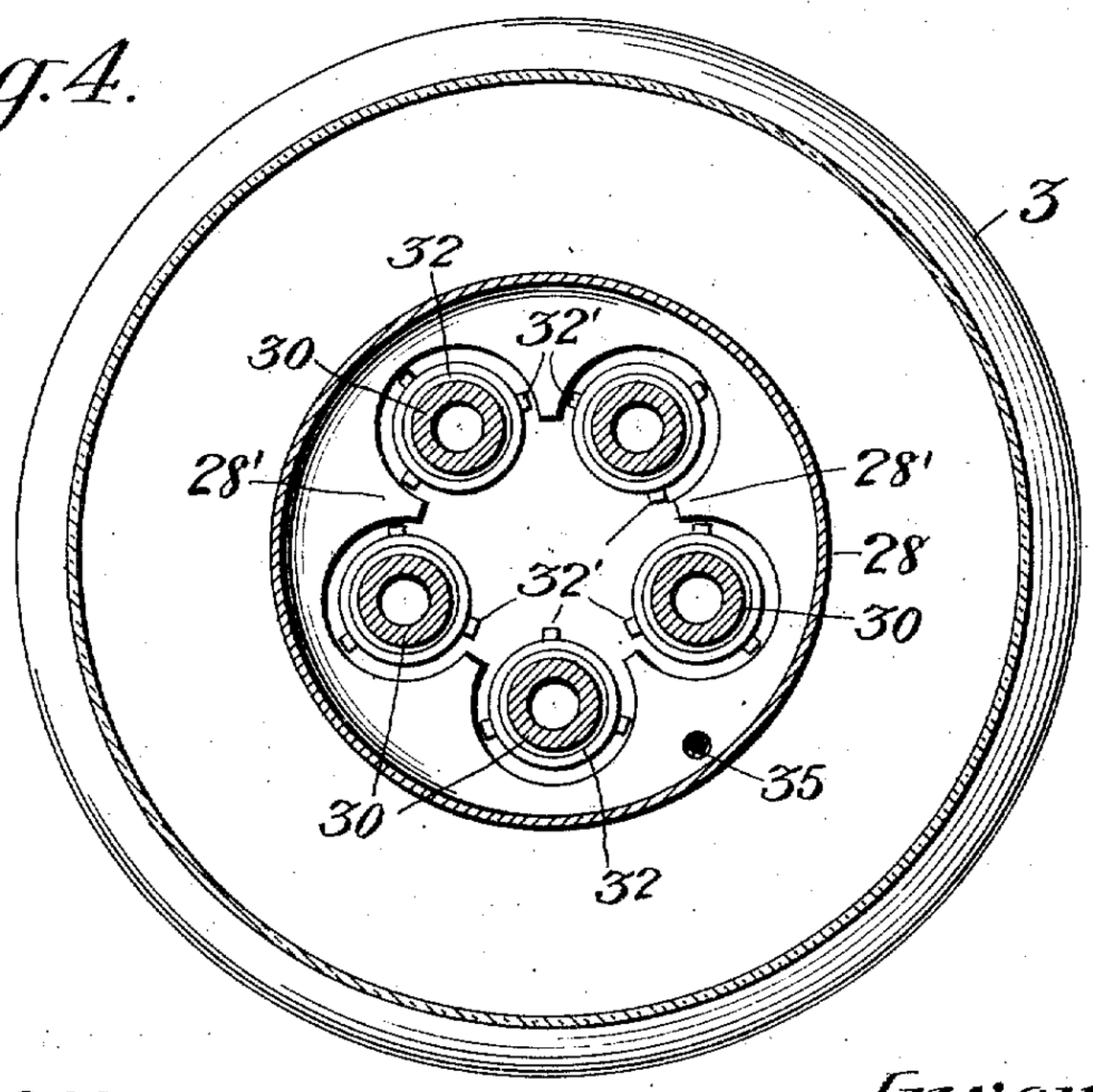


Fig. 4.



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No. 886,712. PATENTED MAY 5, 1908.

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9 SHEETS—SHEET 4.

Fig. 5.

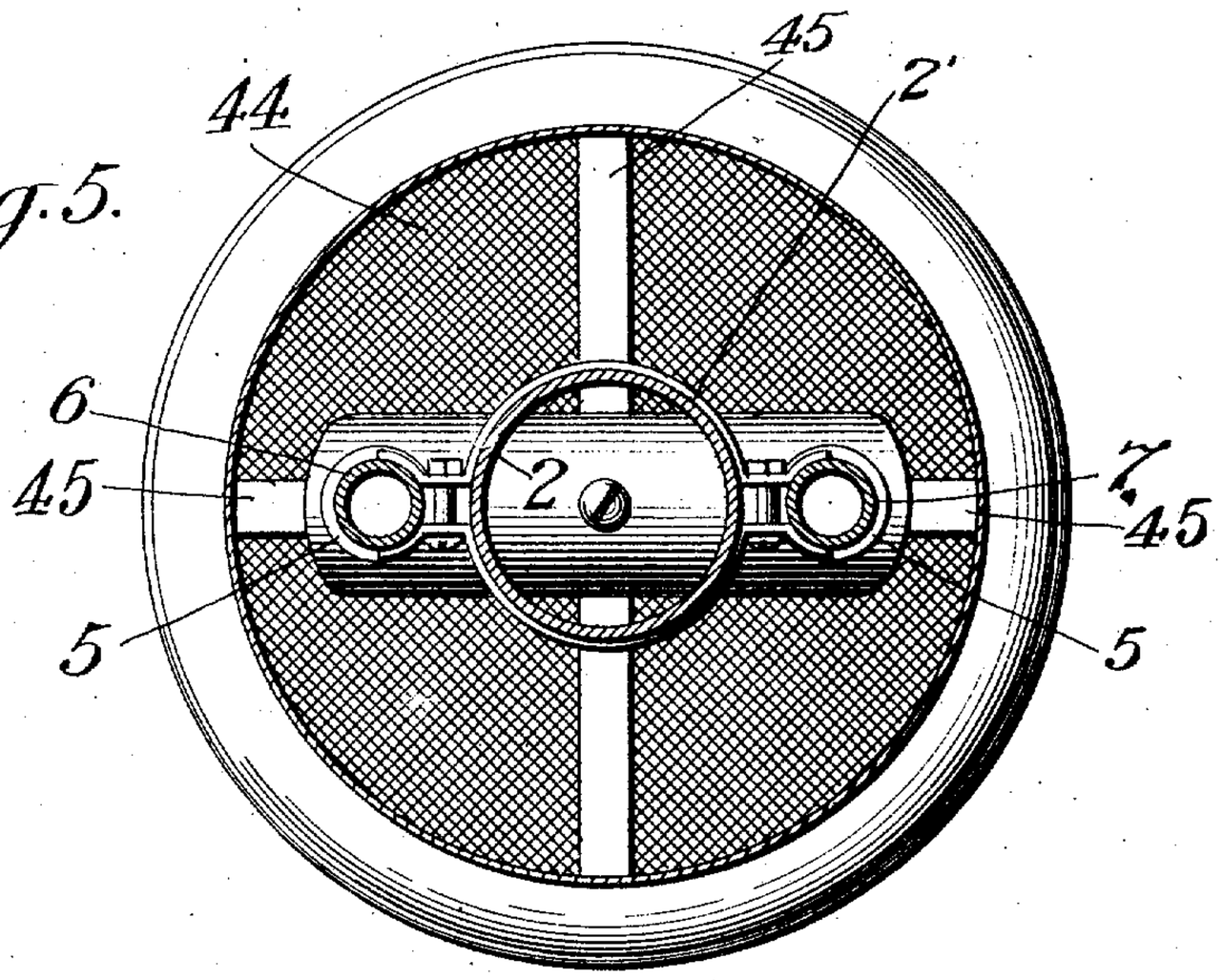
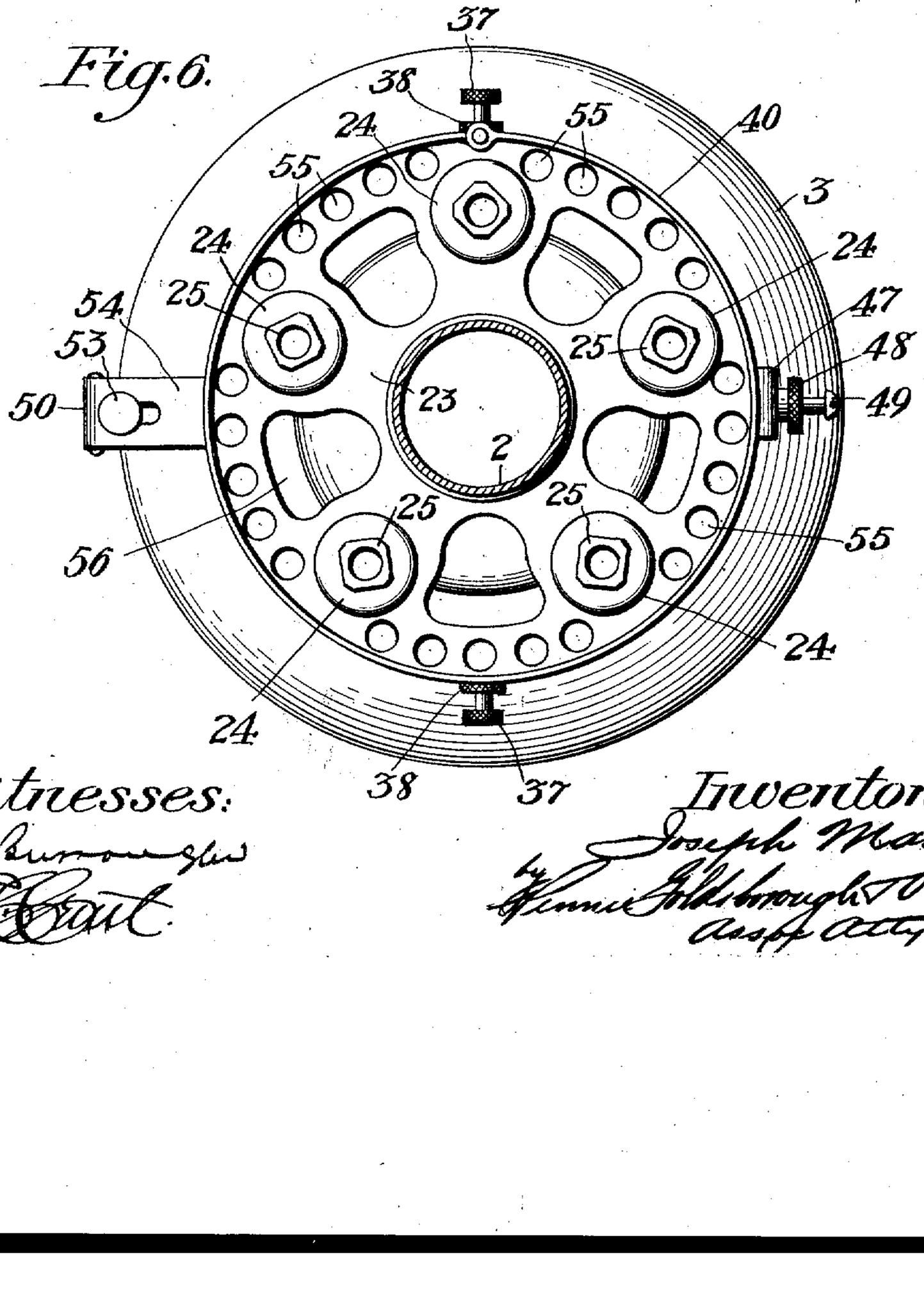


Fig. 6.



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9 SHEETS—SHEET 6.

Fig. 7.

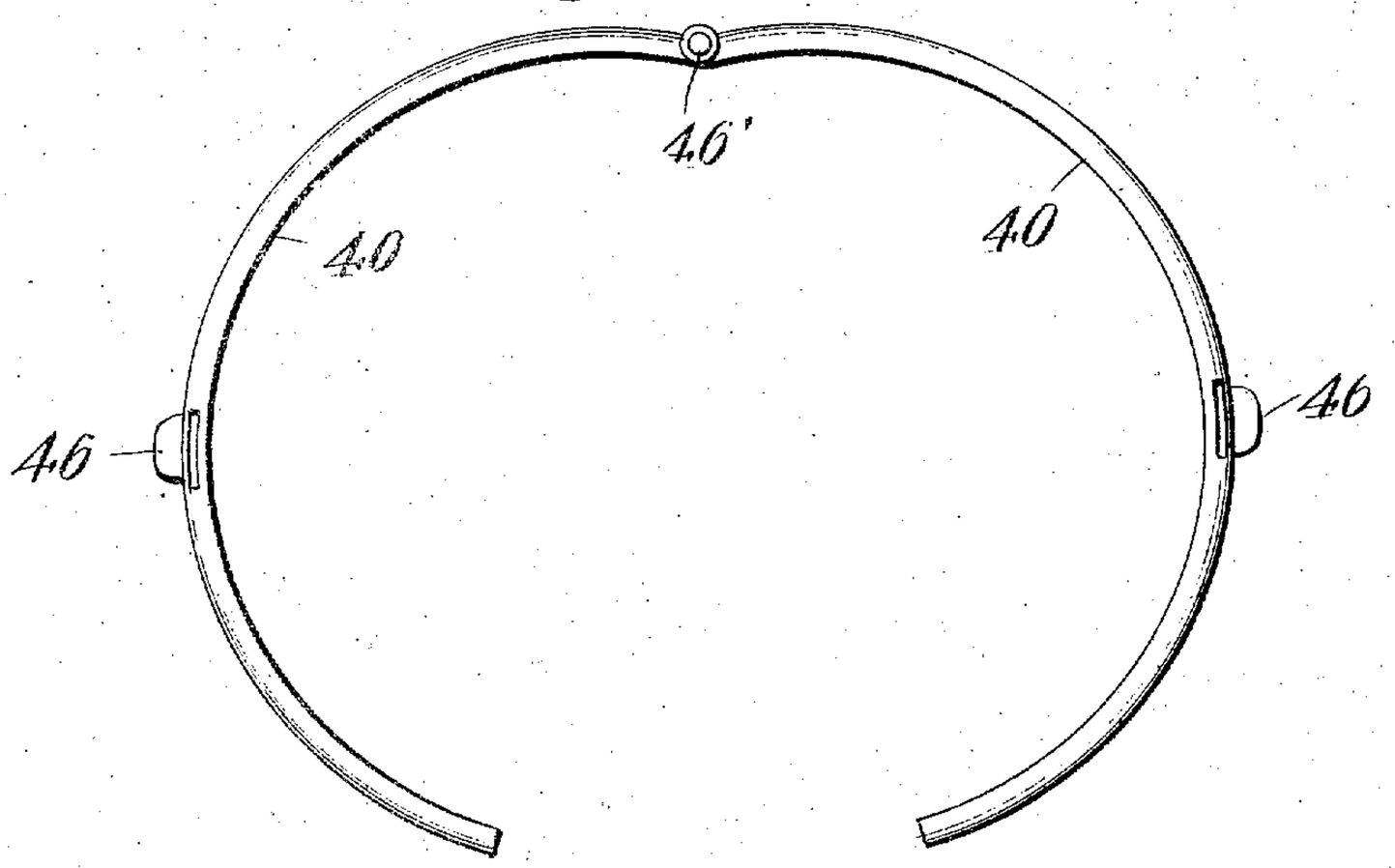


Fig. 8.

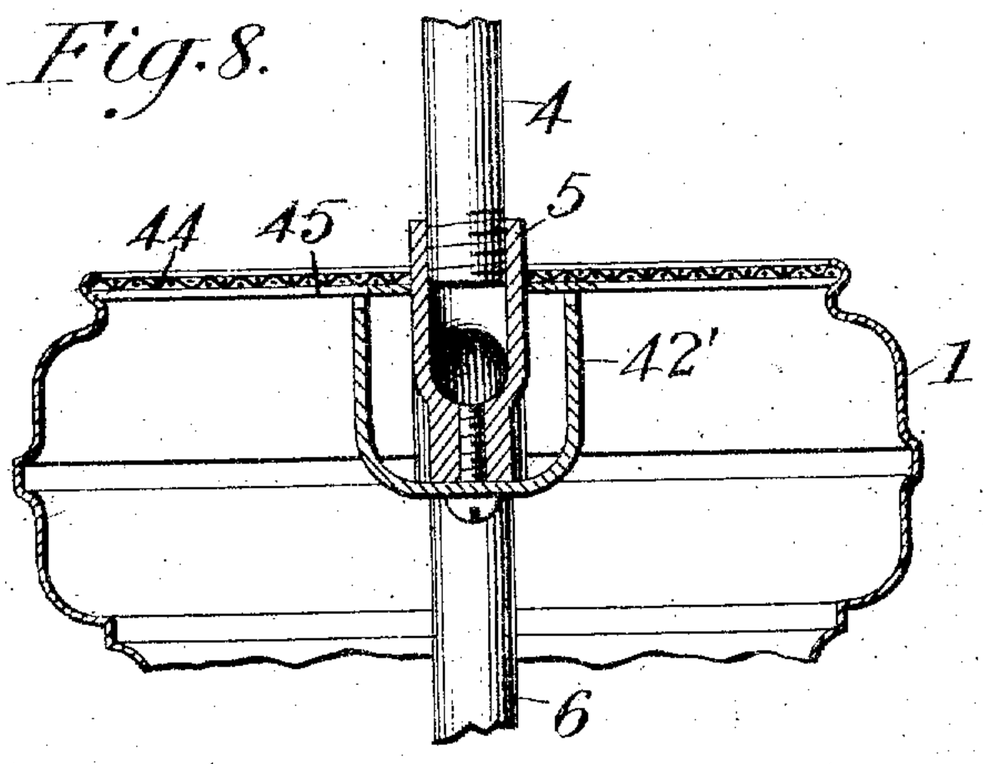
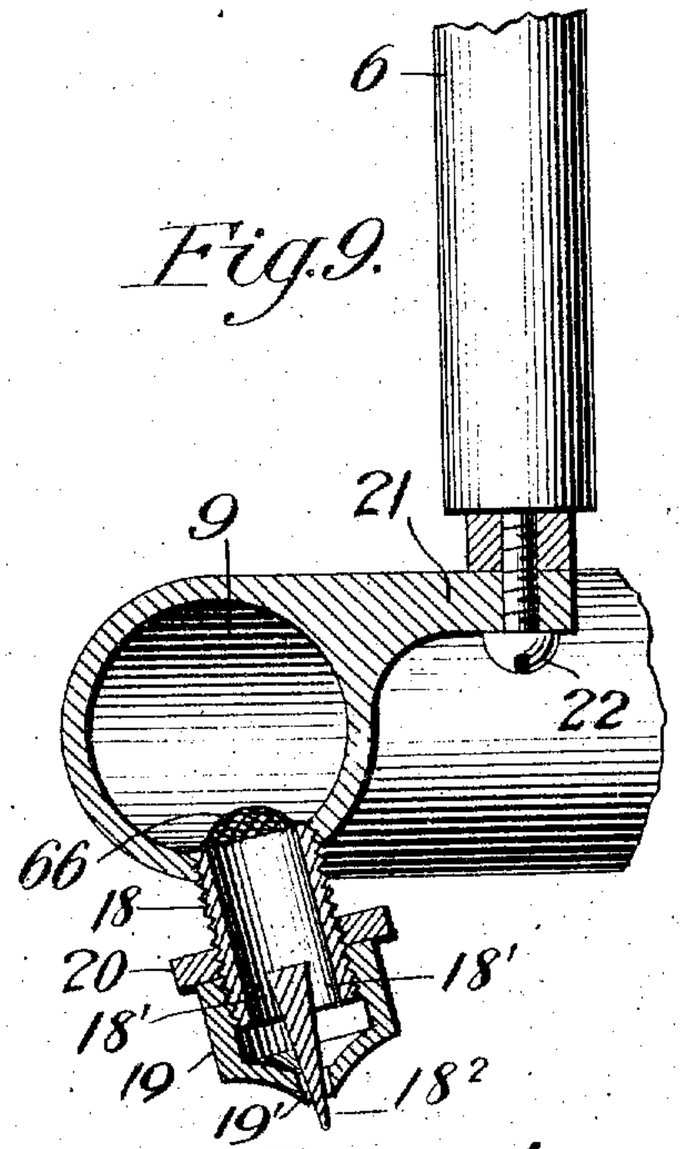


Fig. 9.



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9 SHEETS—SHEET 6.

Fig. 10.

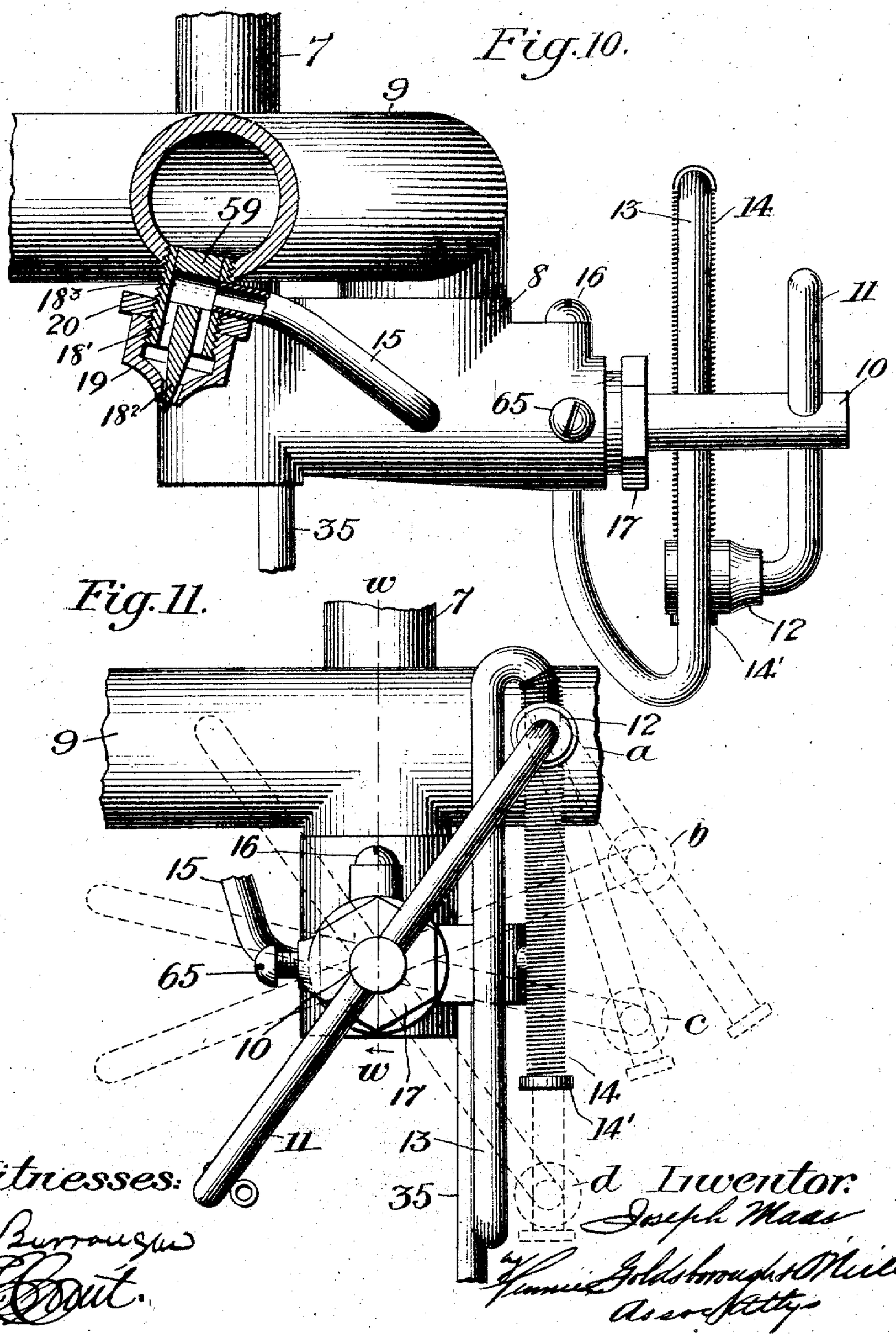

Fig. 11.

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GAS LIGHT FIXTURE.

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9 SHEETS—SHEET 7.

Fig. 12.

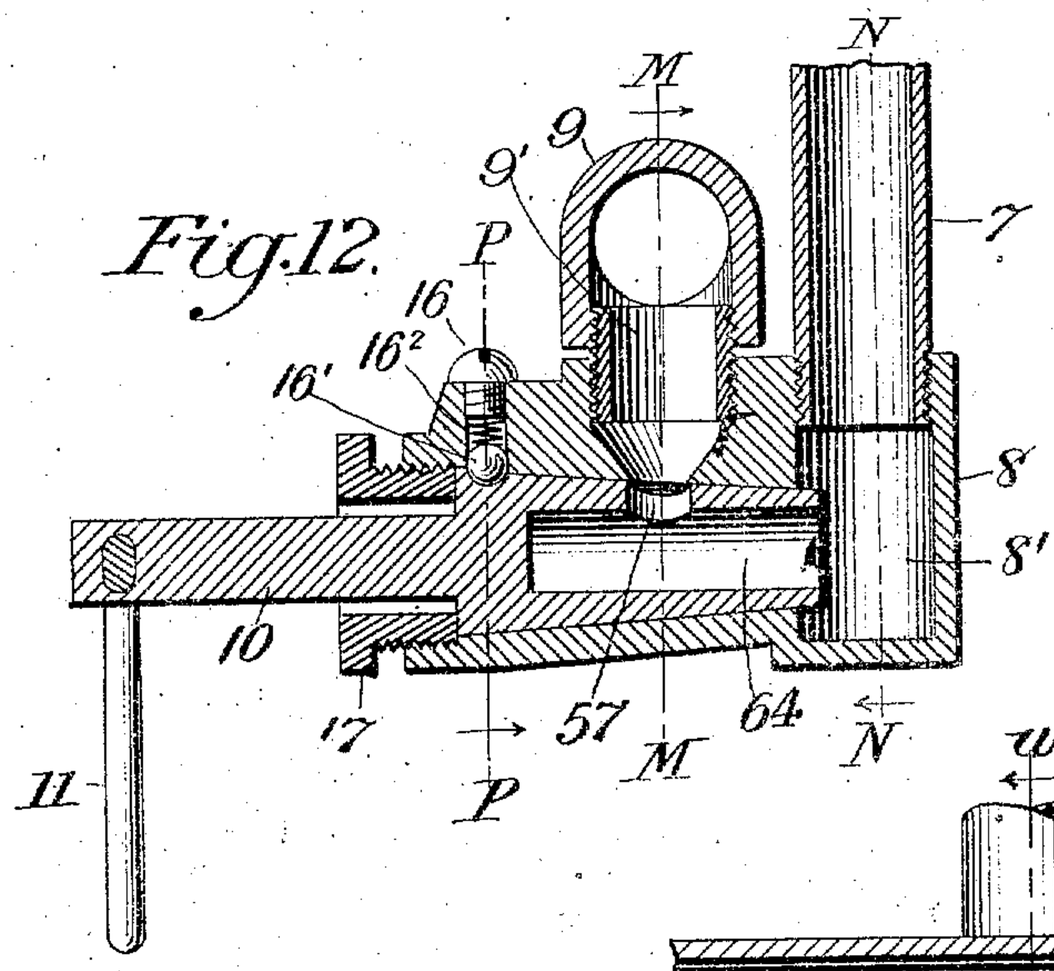


Fig. 13.

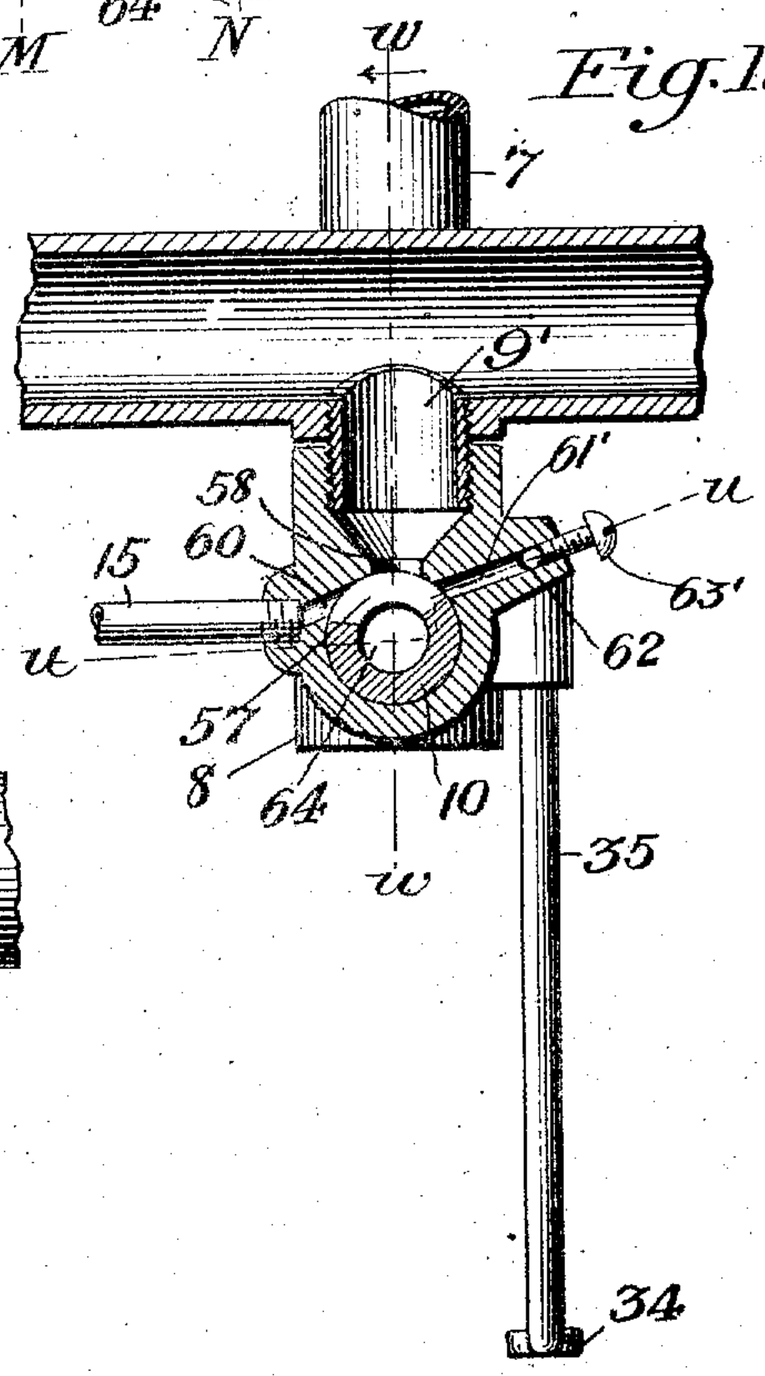
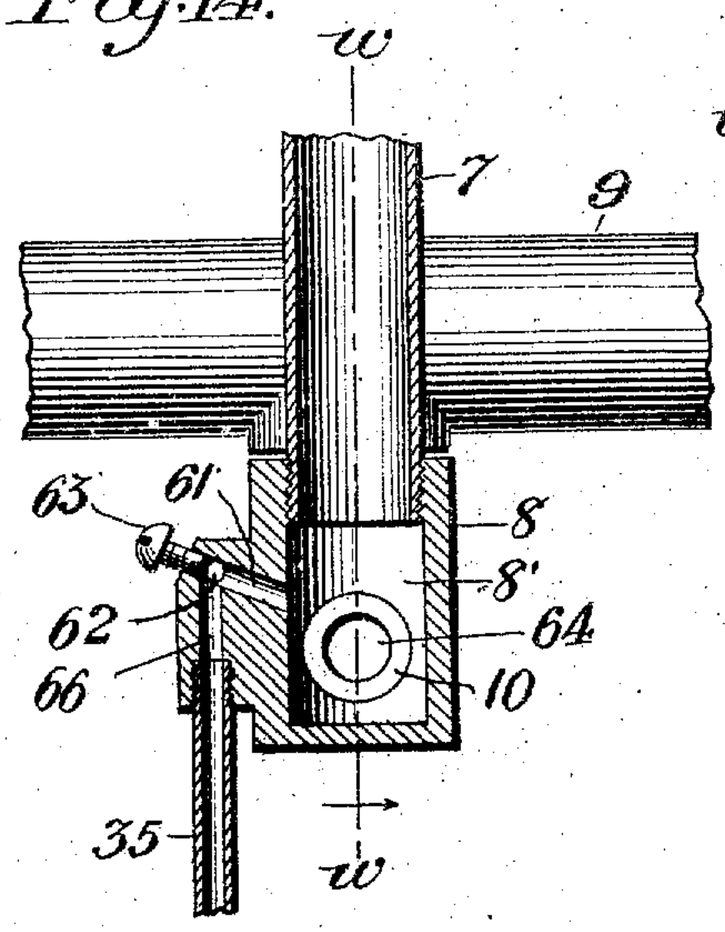


Fig. 14.



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GAS LIGHT FIXTURE.

APPLICATION FILED JAN. 29, 1908.

9 SHEETS—SHEET 8.

Fig. 15.

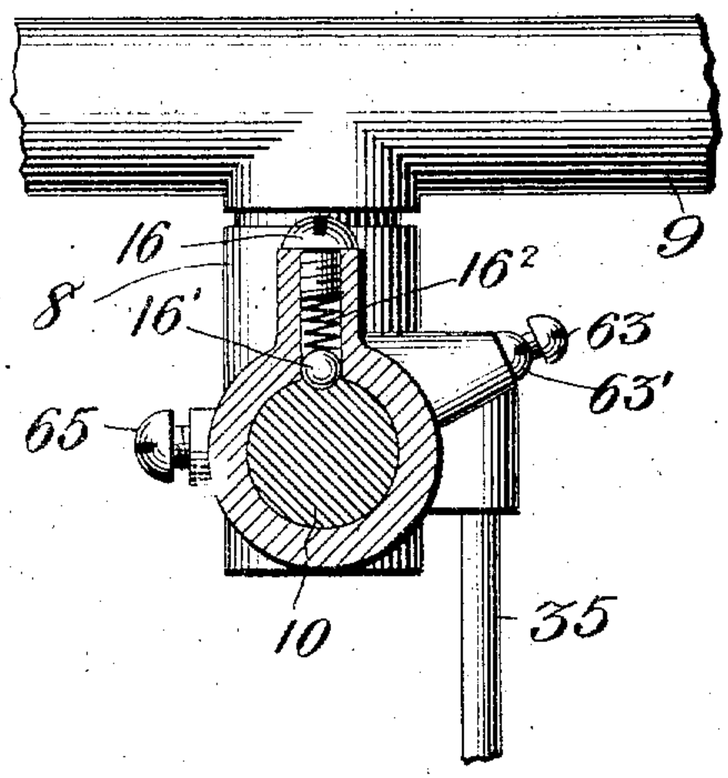


Fig. 16.

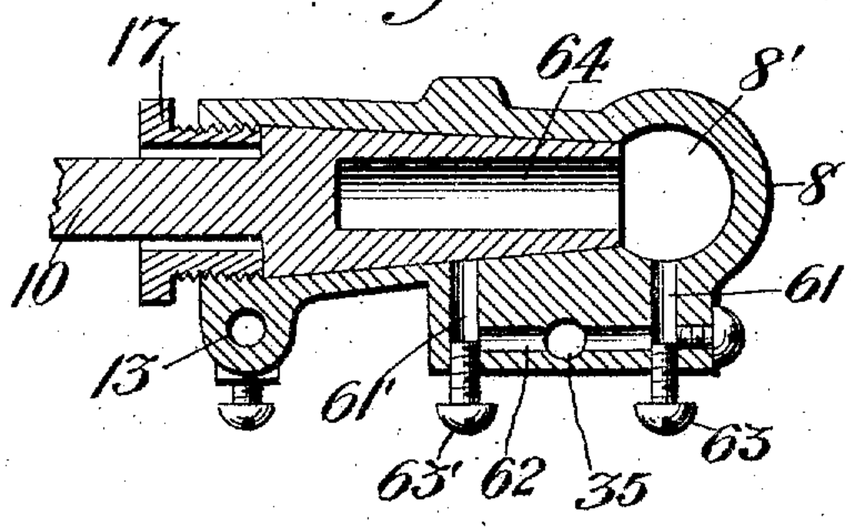


Fig. 17.

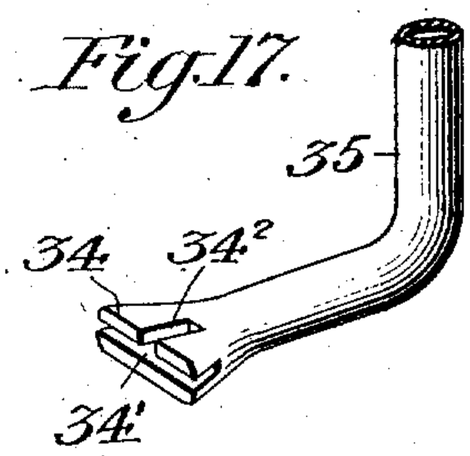


Fig. 19.

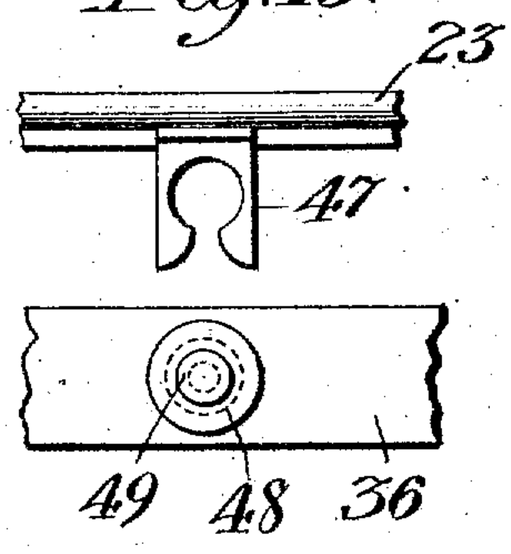
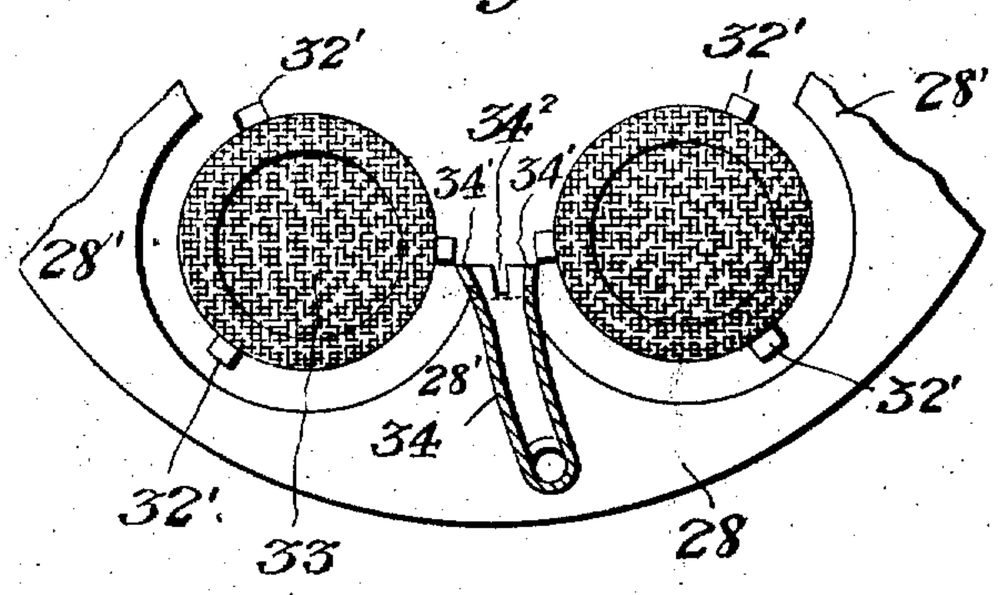


Fig. 18.



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No. 886,112. PATENTED MAY 5, 1908.

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GAS LIGHT FIXTURE.

APPLICATION FILED JAN. 29, 1908.

9 SHEETS—SHEET 9.

Fig. 20.

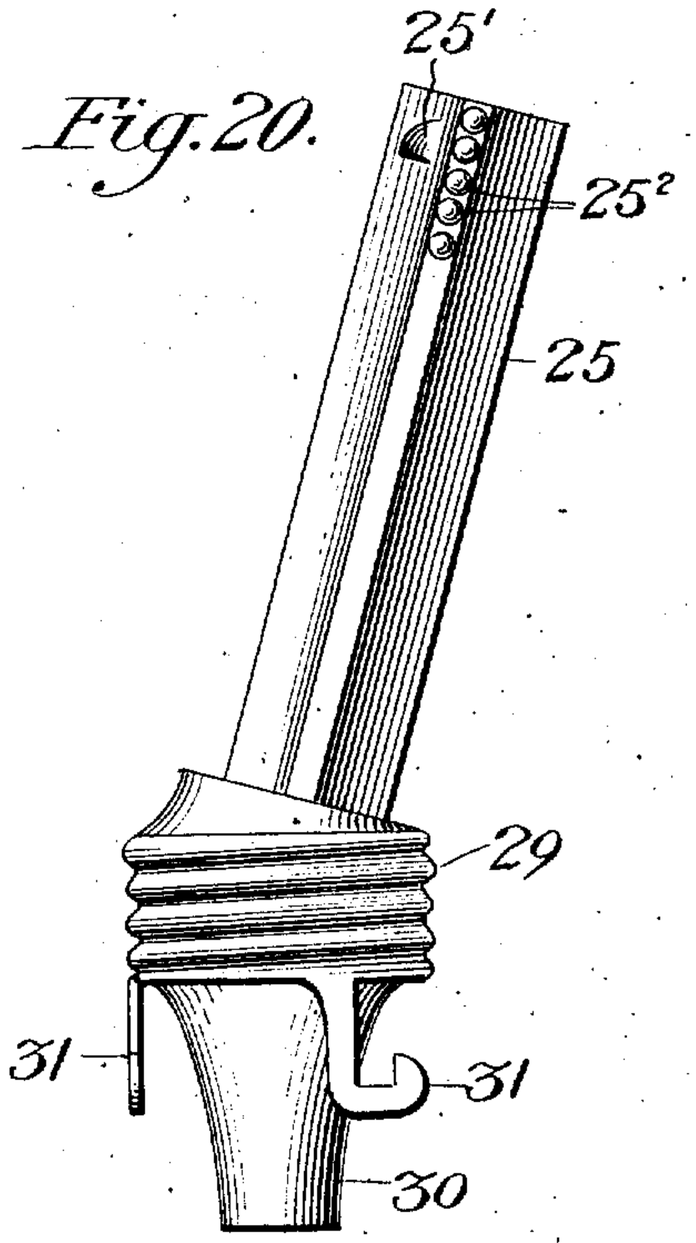


Fig. 21.

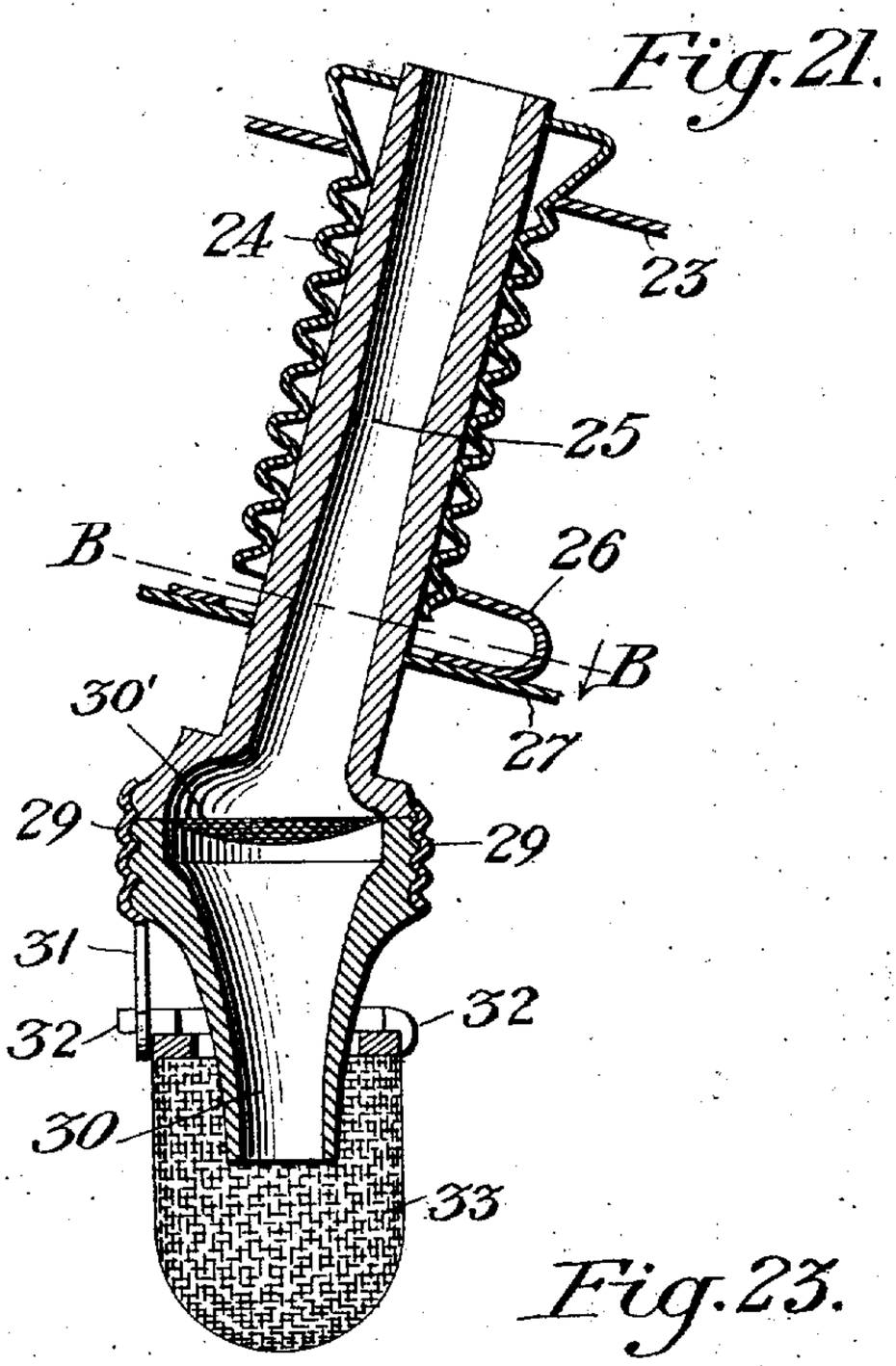


Fig. 22.

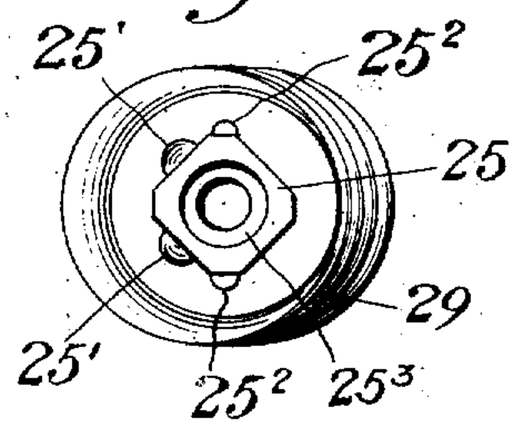
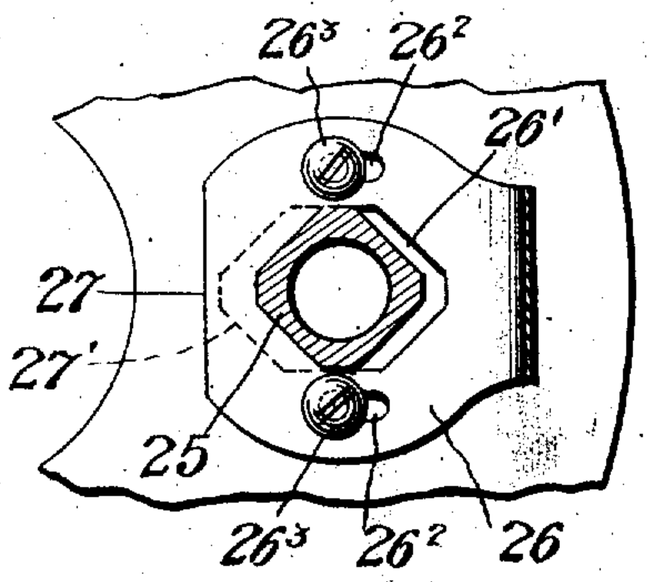


Fig. 23.



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UNITED STATES PATENT OFFICE.

JOSEPH MAAS, OF KALAMAZOO, MICHIGAN.

GAS-LIGHT FIXTURE.

No. 886,712. Specification of Letters Patent. Patented May 5, 1908.

Application filed January 29, 1908. Serial No. 413,198.

To all whom it may concern:

Be it known that I, JOSEPH MAAS, a citizen of the United States, residing at Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented new and useful Improvements in Gas-Light Fixtures, of which the following is a specification.

My invention relates to improvements in gas light fixtures, and is especially intended for use in connection with a cluster of inverted incandescent mantles. Its object is to provide such a light of efficient and simple construction.

In the drawings, Figure 1 is a side plan of the structure complete with the globe closed, and with portions of the side walls removed in order to show the interior construction. Fig. 2 is a side view of the lower portion of the fixture with the inclosing case in position and with the globe open. Fig. 3 is a top plan view. Fig. 4 is a sectional view looking down from *s*—*s* of Fig. 1. Fig. 5 is a horizontal cross-section looking up on the line *y*—*y* of Fig. 1. Fig. 6 is a top plan view looking down from line *z*—*z* of Fig. 1. Fig. 7 shows a top plan of the ventilator casing. Fig. 8 is a vertical cross-section and plan on line *x*—*x* of Fig. 1 looking in the direction shown by the arrow. Fig. 9 shows in detail the arrangement of the nipple and needle valve with relation to the gas ring. Figs. 10 and 11 are respectively front and side views of the valve and attached parts. Fig. 12 is a sectional view on line *w*—*w* of Figs. 11, 13 and 14. Fig. 13 is a cross-section on and projection from line *m*—*m* of Fig. 12. Fig. 14 is a similar section on line *n*—*n* of Fig. 12. Fig. 15 is a cross-section and plan on line P—P of Fig. 12. Fig. 16 is a sectional view on line *u*—*u* of Fig. 13, to show some of the details of the valves and passages therein. Fig. 17 shows the tip of the pilot tube. Fig. 18 is a bottom plan view, looking up, of a portion of the plate surrounding the mantle holders, and showing also the pilot tube tip. Fig. 19 shows the method of holding in position the globe-supporting ring. Fig. 20 is a side view of the Bunsen burner tube and of the mantle nozzle. Fig. 21 is a vertical cross-section of the same parts with the supporting sleeve and other adjacent parts. Fig. 22 is a plan view looking down from the top at the burner tube and attached parts shown in Fig. 20. Fig. 23 shows the locking device which prevents the burner tubes from dropping through the plate 27.

In the drawing the numeral 1 represents the exterior casing made of sheet metal or similar material, and surrounding the upper portion of the structure.

2 is the centrally situated chimney or flue. This chimney or flue carries suitable collars riveted thereto, and these collars carry extensions 2′ which serve as clamps, which, by means of suitable screws, can be clamped down upon the supporting brackets, whereby the chimney is held in the position at which it may be desired to fix the same.

3 is the globe of any suitable size and shape, preferably closed at the bottom and open at the top, as shown.

4 is the gas supply pipe leading the gas from the source of supply to this fixture.

5 is the bracket carried by the pipe 4 provided with an opening for the passage of gas therethrough and carrying depending bracket arms 6 and 7. One of these, as 7, is made hollow, and the gas is thus conducted from the supply pipe 4 to the controlling valve carried in the valve casing 8.

9 is the circular gas pipe or ring, operating to convey gas from the controlling valve to the various burners, and thus eventually cause the inverted mantles 33 to become incandescent.

The casing 1 is supported in position by means of the hangers or brackets 42 encircling the depending arms 6 and 7. To these hangers the casing is firmly fixed in any suitable manner, as, for example, by four screws 43. In the upper open end of the casing 1 I insert the screen 44. This is carried upon the cross-arm frame 45 45 and is provided with a central opening through which the pipe 4, or rather the upward extension of the bracket 5, may pass. One purpose of this screen is to exclude dirt, insects, etc., but by means of its stiff carrying frame and central opening, it also serves to adjust the casing with reference to the pipe and to center the latter and to hold the upper end of the casing in the proper fixed relation to the pipe. This is of especial advantage when the lower part of the casing, being the ventilator extension thereon, is removed as hereinafter described, and the screen and its carrying frame then prevent the casing from rocking upon its

supports and cause the lower end also to maintain its fixed relation to the center or axial line, if this purpose is not sufficiently accomplished by the means which I employ for attaching the casing to the hanging arms 6 7. Upon the lower side of the bracket 5 I attach by a screw, or other suitable means, a plate 42′ which is thus interposed between the bracket containing the gas passages and the top of the chimney and serves to protect the former against excessive heat coming from the latter.

As the gas passes down the hanging pipe 7, it enters the chamber 8′ (Figs. 12, 14 and 16) contained in the valve casing 8. This casing is suitably bored out, preferably upon a taper, as shown, to receive the revolving valve 10 which is operated by the cross-bar 11 and is held in position within its socket by the nut 17, which itself is held in place by the locking set-screw 65. The opposite or interior end of this valve is provided with an opening or chamber shown by the numeral 64, communicating freely and always with the chamber 8′. Gas is therefore always present (when it is being supplied to the fixture) under normal pressure in this chamber 64. Through the side wall of the chamber 64 is bored a suitable opening 57, through which the gas may pass. A similar suitable opening is bored through the wall of the valve casing 8, as indicated by 58 (Fig. 13), and in this opening is inserted a screw nipple, or other suitable device, 9′ communicating with the interior of the gas ring 9. When, therefore, the parts are in the position shown in Figs. 12 and 13, the gas will pass freely from the chamber 64 through the ports or openings 57 and 58 and the communication 9′ into the interior of the gas ring, and will be there present under the existing pressure. Through the wall of this valve casing 8 I also bore a suitable port 60, which opens through into the interior thereof at the side of the port 58 and upon the same transverse plane, so that in the rotation of the valve the port 57 will register first with the port 60 and then, as its rotation continues, will register with the port 58. The port 57 is made of such size that in the rotation of the valve this opening will expose the port 58 and the port 61′ without closing the port 60. From the exterior of the port 60 the gas is led through pipe 15 (see Figs. 10 and 13) to a selected one of the burner valves, which is constructed as shown in Fig. 10, so that it does not communicate with the gas ring. Such communication with the gas ring is prevented by the plug 59. In this way, I am enabled to make the parts of the burner, which is intended to burn singly, the duplicates of similar parts of the other burners and attach them all to the gas ring in the same way, thereby making all the burners and parts symmetrical and corresponding with each other instead of having some independent means of supporting and carrying the gas nozzle intended for use in connection with this burner.

At a point in the same transverse plane through the valve casing, but farther along in the rotation of the valve, I bore the port 61′ (see Figs. 13 and 16). This port communicates with the chamber 62 in the body of the valve casing, and a port 61, leading from the chamber 8′, communicates with the same chamber 62. The amount of opening from these ports into the chamber 62 is regulated respectively by the set-screws 63 and 63′. This chamber 62 opens freely into the pilot light tube 35 which leads away to the pilot light located and operating as hereinafter described. It is evident that if the set-screw 63 is properly adjusted so as to leave a very small opening, gas will be constantly supplied from chamber 8′ to the pilot tube 35 and in a quantity sufficiently minute to maintain the pilot light constantly burning in the ordinary way; and that, if the set-screw 63′ is so adjusted as to permit a larger opening, then, when the valve is rotated so that the opening 57 exposes the port 61′ the gas will be supplied to the pilot tube under a pressure correspondingly greater as the opening permitted by 63′ is greater than that permitted by 63, and the pilot light will therefore be enlarged.

The opening 57 is as above stated, made of such size that in its continued rotation it will expose port 61′ without closing port 58 or port 60, as shown in Fig. 13, and so long as the valve is maintained at this extremity of its rotation, gas will be supplied through 60 and 58 to all the burners and through 61′ will be supplied under pressure to the pilot light, while, when the valve is returned to the position shown by *c*, Fig. 11, gas, under this greater pressure will be cut off from the pilot light, which will return to its normal condition, being supplied only through port 61, and the full supply of gas will be continued to be furnished to all the burners. At suitable points in this gas ring I tap the same with the ordinary nipple 18 (Fig. 9) or 18^3 (Fig. 10). Upon the lower exterior end of this nipple I attach the interiorly-threaded hollow nut and valve-seat 19.

20 is a lock nut of customary form, used to lock or fix the nut 19 in proper position after it has been correctly adjusted. The interior of this nut 19 forms an extension of the chamber 18′ which is in the interior of the nipple 18. The lower end of this nut or valve-seat is preferably made of tapering or of nozzle shape, and is provided at the tip with the tapering opening 19′.

18^2 is a tip or needle point rigidly attached in any suitable manner to the nipple 18, so that the tip will be in the axial line of the nipple, and so as not to close the passage therethrough, but so as to permit gas to pass

from the body of the nipple through into the chamber 18′. It will be obvious that as the nut 19 is adjusted to or from the nipple 18, the exit passage surrounding the needle point 18^2 will be made smaller or larger, and in this way a very convenient and perfect adjustment can be made regulating the amount of gas which will be allowed to escape through the valve-seat, and when the adjustment is perfect the lock nut 20 will be turned down into position and the fixed adjustment will then be maintained. By this construction I am enabled to avoid using any needle valve passing through the gas ring and thereby avoid the necessity of having the upper portion of the gas ring accessible, as is required for the adjustment of the ordinary needle valve passing through such ring, and also avoid the clogging and choking effect caused by obstructing the interior of the gas ring, but, on the contrary, I am enabled to have the interior of the gas ring free from any obstruction whatever, save as the nipple may project into the same slightly from the bottom, as indicated in Figs. 9 and 10. The gas passing out of this gas nozzle 19 then enters the head of the burner tube 25 (see Figs. 20 and 21). I find it convenient to cast this tube of brass or other suitable metal, and I construct it so that the exterior of its cross-section will be approximately square. This is to get the effect of a spline, and, in connection with the shape of the opening through plate 27, prevents rotation of the tube 25 when its sleeve 24 is rotated, and at the same time permits the tube to slide longitudinally within the sleeve. The interior of the tube contains an open passage for the mixed gas and air which has entered its upper end, and this passage may be of the form shown in Fig. 21. Upon the exterior of the tube 25 I attach two suitable shoulders 25′ which normally prevent it from dropping through the opening in the plate 27, and I also attach upon opposite corners a series of lugs 25^2 which work within the grooves of the sleeve 24 and thus operate like an exterior screw-thread upon 25, and serve, as the loose sleeve is rotated, to move the tube 25 longitudinally therein.

The plate 27 is provided with a suitable opening 27′, of shape corresponding with the exterior shape of tube 25, but elongated in one direction so that when this opening is unobstructed the shoulders 25′ located upon adjacent corners of the tube as shown in Fig. 22, will not prevent the tube from dropping through the opening, such opening having the full size shown in Fig. 23 by the solid lines at the right in contact with the tube and by the dotted lines at the left. Upon the upper surface of plate 27 I provide the locking slide 26. This is held to the plate 27 by pins 26^3 and contains slots 26^2 which permit the locking plate 26 to slide toward and from the center of the fixture. This slide is provided with an opening the same size as the opening in plate 27, and when, therefore, the slide is pushed to its extreme position at the left in Figs. 21 and 23, the opening in the slide and the opening in plate 27 will register with each other, and the tube 25 with its attached shoulders may drop therethrough. When, however, the slide 26 is drawn to its position at the right, as shown in Fig. 23, the tube 25 will bear against, upon the right, the edge 26′ of plate 27 and at the left the opposite edge of the opening in slide 26, and the net opening will therefore be of the same size as the tube, and the shoulders 25′ will come in contact with and be stopped by this portion of the slide 26. With the construction indicated by Fig. 21, the natural tendency of the slide will be to take the right hand, or lower position, and this is the locking position, so that the tube would be normally locked against withdrawal or accidental dropping out at the bottom, but can easily be removed by pushing the slide up to the other position. Additionally to insure that this slide shall normally be in the locked position, I provide it with an upper bent-over wing or extension, as shown in Fig. 21, which wing comes in contact with and bears against the exterior of the sleeve 24. It follows that the slide can not be adjusted to its open or unlocked position unless the sleeve is lifted from its normal position and an intentional effort made to move the locking slide to the left. Mere continued rotation of the sleeve, therefore, continued too long can not permit the tube to drop out at the bottom. I construct this burner tube 25 with an enlarged foot, as shown, and in such form that the main portion of the tube will be at an angle to the axis of the chimney, while the sides of the foot will be parallel to said axis; or, in other words, will be vertical. The vertical sides of this enlarged foot are provided with a screw-thread, and the mantle nozzle 30 is provided with a similar thread at its head. These two parts are held together by the threaded sleeve 29, and a suitable screen, as 30′, may be provided at any suitable point. This sleeve 29 may be screwed up on the foot of 25 to a greater or less height, as desired, and thereby the elevation of the mantle supports 31 can be adjusted. The hooks at the lower ends of these mantle supports 31 receive the ring 32, having arms 32′ (Fig. 18), from which the mantle 33 is dependent. It is obvious that by means of the sleeve 29 the distance between the mantle nozzle and the mantle itself can be adjusted, and that, by reason of the angle of the burner tube and the change from an angling to a vertical direction, the heads of the burner tubes can be a sufficient distance removed from the

zone of heat and at the same time the jet of burning gas and air can be directed upon the center and not upon the side of the mantle.

Attached to the central chimney by means of a collar I have shown a burner-supporting plate 23 (Fig. 6), which, for convenience, is made to flare outwardly and downwardly. It is closed on its inner edge by the chimney 2 rising therefrom, and on its outer edge by the ventilator casing 40 rising therefrom. In suitable places, as around its outer edge, are ventilating openings 55, which permit the air to pass downwardly into the globe. For a greater freedom of ventilation in the same way I provide the enlarged openings 56 and retain imperforate only sufficient of the plate 23 so that it may be strong enough to serve its purpose of supporting the burner tubes. Also, by providing these larger openings 56, I am sure that the outer air will pass in its downward course on nearly all sides of the head of the burner tube, and thus additionally insure that the air entering the burner tube for mixing with the gas shall not be improperly heated. Suitable openings through this plate also provide for the passage therethrough of the burner tubes 25 and the surrounding revolving sleeves 24 having, as shown, the enlarged funnel-shaped heads which permit the free entry of the air and prevent the sleeves from dropping through the openings and whereby the burner tubes and attached mantles are supported, while, by rotating the sleeve as hereinbefore explained, the head of the tube is brought toward or away from the gas nozzle 19 and the amount of air which is mixed with the gas is thereby regulated. This plate 23 also carries depending therefrom, the vertical arm 47 and the angling arm 54 opposite to each other and for convenience in attaching these arms the outer edge of the plate 23 may be turned down into a flange or bead, as shown in Fig. 2. The globe-supporting ring 36 is hinged to the arm 54, and the globe is held in position in the ring by a series of suitable set-screws and nuts 37 38. When the globe is in the closed position shown in Fig. 1, it is held closed through the operation of the headed pin 49. The sleeve 48 slides longitudinally upon this pin and there is provided a slotted and enlarged opening in the arm 47 such that when the parts are brought together and the sleeve 48 is pushed inwardly, this sleeve can not pass through the contracted opening in the arm 47, and the globe-supporting ring is therefore held up close against the plate 23. When, however, the sleeve 48 is returned into the position shown in Fig. 2 the pin 49 can pass through the neck of the opening in 47, and the globe-supporting ring carrying the globe will then swing downwardly upon the hinge 50 at the lower end of the arm 54, this hinge connecting the lower end of such arm and the corresponding arm 51 attached to the ring 36. This locking device is shown in detail in Fig. 19.

In the arm 54 I provide a central longitudinal slot in which the headed pin 53 travels, and to that side of the arm 51, which is the upper side in Fig. 2, or the under side when the globe is closed, I attach an extension arm 52, the free end of which laps over and rests along the upper side of the arm 54 when the parts are in the position shown in Fig. 2. Just before this free end of 62 in the revolution of the parts upon the hinge 50, reaches the position shown in Fig. 2, it will strike the head of the pin 53 and will tend to push this head upwardly out of its way, so that the pin 53 will retreat upwardly in the slot in which it travels. If necessary, the pin 53 can be manually moved upwardly in its slot, so that the head of the pin will be out of the way of the swinging free end of the arm 52. Then, when this arm 52 lies flat against arm 54, the pin 53 may be moved, or, by gravity, will drop back to the position shown in Fig. 2, so that the head of the pin extends over the end of arm 52 and locks it in position. In this way, instead of permitting the globe to hang down vertically from the hinge and thus leaving it in the way of the operator who is cleaning the lamp or renewing the mantles, I cause the globe to swing through a complete half of a circle and then to be locked up at one side wholly out of the way of the operator. When he has finished he pushes the headed pin 53 upward a trifle in its slot, and the ring and globe are then free to swing upon the hinge 50 and to be returned to their former position up in close contact with the plate 23, as shown in Fig. 1.

It is necessary that sufficient external air be supplied both to the Bunsen tubes and to the incandescent mantles, and, for this purpose, it has been customary to make openings or perforations in the external casing surrounding the structure. My external casing terminates, at its lower end, just above the gas ring; but in the downward extension 40 of this casing, I provide ventilating openings 39; and in order to provide easy access to the parts surrounded by this downward extension, so that such parts may be adjusted and regulated and cleaned, I make this downward extension removable from the remainder of the structure. By making it thus separable in whole or in part, as hereafter described, I avoid the necessity for making the casing itself vertically movable, or for telescoping one portion of the casing upon another portion thereof. This ventilator casing extension 40 is made preferably of stamped sheet metal, and made in a plurality of separate parts, which may, if desired, be hinged together. I have shown two parts or halves hinged together at 46', as shown in Fig. 7, such point of hinging being substantially opposite the meeting point of the free

ends of the two halves, which is at the valve as indicated in Fig. 2, and these free ends are cut away so that as they come together they will surround the valve casing and so that the valve casing will not prevent them from coming substantially together at the remainder of their meeting edges. The upper edge of this casing extension is provided with a bead 41 (Fig. 1) adapted to fit over the lower edge of the main body of the casing, and the lower edge may be provided with a similar bead adapted to fit over a suitable projection upon or connected with the plate 23. Each half section of this casing 40 is provided with a catch or lock 46, shown in Figs. 2 and 7. This catch or lock may turn or slide so as to pass up into or within the lower edge of the upper main part of the casing, and may, as in the form I have shown, pass through a slot in the bead 41. The hinge 46′ extends the full width or height of this casing section and it is, therefore, apparent that when the catch 46 upon the right side of Fig. 2 is interlocking with the casing above and the catch upon the left side is unlocked, the left half of this casing will swing around on the hinge, or be removed if no hinge be used, and expose that half of the interior, and that this half may again be returned to position and its catch or lock 46 be closed and then the corresponding lock upon the other half be opened and the other or right half will swing around upon the hinge or be removed and expose that half of the interior; or that, if both catches are unlocked at once, both halves may be removed or opened slightly upon the hinge and the entire device can then be removed and placed in any convenient location until the work is finished and the operator is ready to replace this ventilator casing section. When in position, the interlocking of the bead 41 with the adjacent edge of the main casing above prevents any vertical motion, and the interlocking by the catches 46 prevents any lateral motion, so that the structure is perfectly firm and rigid.

The gas ring is supported in proper position upon one side by the valve casing through the nipple 9′ and upon the other side by a suitable bracket 21 held to the arm 6 by the screw 22 (see Fig. 9).

The protecting plate 42′ obviously can not be extended over the whole top of the chimney without seriously affecting the draft therethrough, and I have, therefore, found it especially desirable to make it in the turned-up form clearly shown in Fig. 8, so that it protects the whole of the bracket 5 but does not seriously impede the draft of the chimney.

I have already described the general construction of the valve and valve casing. It is apparent that when the valve (see Fig. 13) is rotated to its extreme position toward the left, the opening 57 will be below the port 60 and the passage of gas through the valve will be entirely prevented (excepting through the valve casing to the always burning pilot light). This described position is the position of the valve when the parts are as shown by the solid lines in Fig. 11, the same being the position indicated by the letter *a*. A suitable downward pull upon the head 12 will change the parts to the position indicated by the dotted lines marked *b*. The opening 57 will then register with the port 60 and gas will be supplied through the pipe 15 to its proper burner, which is one of those located immediately adjacent to the pilot light, and this burner will therefore be ignited by that pilot light. It is necessary for the user to know when this point is reached in the rotation of the valve, and for this purpose I provide the device shown in Figs. 12 and 15. I bore a suitable opening through the valve casing and insert therein the coiled spring 16^2, the tension of which can be regulated by the screw 16, and in the bottom of the opening, and under suitable tension from this spring, I insert the round ball 16′. I then cut a shallow concave depression in the exterior of the valve 10 and opposite this described spring and ball, and at such a point in the circumference of the valve that the two register and the ball will drop into the depression just at the instant when the parts reach the position shown by dotted lines *b* in Fig. 11 and when the passage 57 60 15 is open. This serves to check the rotation of the valve at that point and hold the same stationary at that point, but at the same time the depression into which the ball drops is so slight and the tension of the spring is such that a little additional force exerted to continue the rotation will force the ball back against the spring and permit the rotation to continue. This device is therefore an indicator stop, but not an absolute stop, and it works as described in this forward rotation of the valve at a point when one light only is provided with gas and is burning, and it works in a similar way on the opposite rotation of the valve when all the lights but one have been extinguished, and this one only remains burning. As the forward rotation of the valve continues, the parts will take the position shown by the dotted lines *c*, and if it is still further continued with sufficient force to overcome the tension of the spring 14 bearing against the head 14′, which spring is carried on the bent arm 13, the parts will take the position shown by the dotted lines *d* until the force is released, when they will automatically return to the position shown by *c*. The effect of this construction is to supply gas first to one burner and then to all the burners, and then, finally, for enlarging the pilot light and then automatically returning the pilot light to its normal condition. This construction and operation are more

fully described in my pending application, Serial No. 360,456, and I, therefore, do not here describe them more at length.

At the lower end of the central chimney 2 I provide the outwardly-extending flange which I have heretofore called the plate 27, and at the outer edge of this plate 27 I provide a vertically-descending annular flange 28, and again at the bottom of the flange 28 I attach a bottom plate or approximately horizontal inwardly-extending flange shown in Fig. 4 by 28′. I cut away the central portion of this and also cut away suitable recesses therein to permit the mantles to hang therethrough, so that the bottom plate 28 is provided with points or projections extending toward the center and serving partially to separate the mantles from each other and serving substantially to direct the upward current of air in part around and close to the outer side of each mantle, but mainly through the central opening.

In the valve casing I provide a downwardly-extending port or passage way 66 (Fig. 14), communicating through 62 with 61 and 61′ as regulated by 63 and 63′ and I insert the upper end of the pilot light tube 35 into this port or opening 66. The pilot tube 35 passes directly down through the plate 27 inside of 28 and through 28′ and then makes substantially a right angled turn so that the tip 34 lies close along the bottom of plate 28′, this tip extending, as shown in Fig. 18, just past the end of the inwardly-extending point of the plate 28′. The tip itself is constructed as shown in Fig. 17, being flattened laterally and provided with the lateral slot 34′ and the vertical slot 34^2. The base of this slot 34^2 should just clear the point of the inward projection of plate 28′. By this construction the normal, continual, minute pilot flame will rise through this vertical slot and will be confined to a point near the base thereof. The projecting point of plate 28 will divert the upward current of air so that such current at the point where the flame is located will be slight and it will not accidentally blow out, and in addition the projecting broad, flattened tip terminating in the slot 34′ will be a similar protection. The slot 34^2 being vertical, carbon will not accumulate around it and choke it as with a horizontal slot or a mere minute orifice. This continually burning flame is located so near the side lines of the mantles that as soon as gas is supplied to either one of the adjacent mantles, the same will ignite. When the pressure of gas is increased the flame will be driven out from the horizontal slot 34′ in a broadening, flaring shape, and under normal pressure will reach to and will ignite the gas supplied to all the mantles of the cluster. I find this to be a more efficient and satisfactory arrangement and location of the pilot light both for permanent and for temporary operation than if the same were located elsewhere. The main body of the pilot tube being straight, it can be inserted from the bottom and screwed into the valve after the other parts are assembled and the tip 34 being perfectly accessible as soon as the globe is opened, any clogging of the tip can be remedied by picking out or removing the obstruction without the necessity of moving any part except the globe; or, if desired, the pilot tube can be easily removed for more thorough cleaning.

Instead of showing the vertical slot 34^2 extending through the tip from top to bottom, I have shown it extending only through the upper wall of the tip, although I do not confine myself to this particular construction.

What I claim is:—

1. In a gas light fixture, the combination of the central gas supply pipe, bracket hanger arms depending therefrom, a casing rigidly attached to said bracket arms, and a foraminous plate and a reinforcing frame surrounding the gas supply pipe and fitting within the upper end of said casing.

2. In a gas light fixture, the combination of the central gas supply pipe, bracket hanger arms depending therefrom, a casing rigidly attached to said bracket arms, and a wire mesh plate and a reinforcing frame surrounding the gas supply pipe and fitting within the upper end of said casing.

3. In a gas light fixture, the combination of the central gas supply pipe, bracket hanger arms depending therefrom, a series of inverted burners connected with said supply by one of said bracket arms, a central flue or chimney attached to said bracket arms, a globe inclosing said burners, a casing comprising an upper portion rigidly attached to said bracket arms and a lower portion removably secured to said upper portion.

4. In a gas light fixture, the combination of the central gas supply pipe, bracket hanger arms depending therefrom, a series of inverted burners connected with said supply by one of said bracket arms, a central flue or chimney attached to said bracket arms, a globe inclosing said burners, a casing comprising an upper portion rigidly attached to said bracket arms and a lower portion formed of separate sections removably secured to said upper portion.

5. In a gas light fixture, the combination of the central gas supply pipe, bracket hanger arms depending therefrom, a series of inverted burners connected with said supply by one of said bracket arms, a central flue or chimney attached to said bracket arms, a globe inclosing said burners, a casing comprising an upper portion rigidly attached to said bracket arms and a lower portion formed of separate hinged sections removably secured to said upper portion.

6. In a gas light fixture, the combination

with the gas supply pipe, a series of inverted burners connected therewith, a central flue or chimney attached to said gas pipe, a casing comprising an upper shell rigidly attached to said gas pipe and a lower circular portion removably secured to the upper shell.

7. In a gas light fixture, the combination with the gas supply pipe, a series of inverted burners connected therewith, a central flue or chimney attached to said gas pipe, a casing comprising an upper shell rigidly attached to said gas pipe and a lower circular portion formed of separate sections removably secured to the upper shell.

8. In a gas light fixture, the combination with the gas supply pipe, a series of inverted burners connected therewith, a central flue or chimney attached to said gas pipe, a casing comprising an upper shell rigidly attached to said gas pipe and a lower circular portion formed of sections hinged together, said sections being individually removably secured to the upper shell.

9. In a gas light fixture, the combination of a central supply pipe, a casing secured thereto, said casing including an upper fixed shell and a lower annular extension comprising separable sections and means for removably securing the individual sections to the upper shell.

10. In a gas light fixture, the combination of the gas supply pipe, lateral bracket arms attached thereto burners in communication with said supply pipe, a central flue or chimney supported on said bracket arms, and a deflector plate generally U shaped in cross section disposed beneath and at the sides of the connection between the supply pipe and the bracket arms.

11. In a gas light fixture, the combination of a gas supply pipe, a T coupling attached to said pipe, lateral bracket arms attached to said coupling, burners in communication with said supply pipe, a central flue or chimney supported on said bracket arms, and a deflector plate generally U shaped in cross section attached to and surrounding the bottom and sides of said coupling.

12. In a gas light fixture, the combination of the gas supply pipe having lateral bracket arms, a casing fixed thereto, a central flue or chimney supported on said arms, burner tubes passing through said chimney, and an outwardly and downwardly projecting flange secured to said chimney in which said burner tubes are supported, said flange being provided with openings of relatively large extent to provide for ingress of air to the burners.

13. In a gas light fixture, the combination of the gas supply pipe, a chimney or flue, a burner passing through said chimney, and a pilot burner having its tip adjacent to said burner, said tip being flattened horizontally and having a jet opening in its upper face for the normal pilot flame, which is protected by the flattened tip.

14. In a gas light fixture, the combination of the gas supply pipe, a chimney or flue, a burner passing through said chimney, and a pilot burner having its tip adjacent to said burner, said tip being flattened horizontally and having intersecting horizontal and vertical slots therein.

15. In a gas light fixture, the combination of the gas supply pipe, a chimney or flue, a series of burners passing through said chimney, and a pilot burner having its tip adjacent to said burners, said tip having a horizontal slot in the end thereof and a vertical slot intersecting the same, the latter slot supplying the normal pilot flame which is protected by the extended point of the burner.

16. In a gas light fixture, the combination of the gas supply pipe, a chimney or flue, a series of burners passing through said chimney, a plate located in the lower end of the chimney having its central portion and the portions about the burners cut away to afford free draft to the chimney and a pilot burner having a tip extending below said plate, said tip having intersecting horizontal and vertical slots in its end, the vertical slot lying below and adjacent a projecting edge of said plate whereby the flame from said slot is protected.

17. In a gas light fixture, the combination of a gas supply pipe, a chimney or flue, a series of inverted burners passing through said chimney, mantles for said burners, and a plate located in the lower end of said chimney cut away at its center and at the portions surrounding the mantles and having tongues projecting between the mantles, said plate serving to direct the air currents around the outside of the mantles and through the central opening.

18. In a gas light fixture, the combination of a gas supply pipe, a gas delivery ring connected therewith, Bunsen burners receiving gas from said ring, means for supporting said burners at a distance from and independently of said ring, and needle valves interposed between the ring and each burner, said needle valves each comprising a nipple opening into the ring, a tapering valve fixed in said nipple, and a valve seat having a tapering opening coöperating with said valve adjustably connected with said nipple.

19. In a gas light fixture, the combination of a gas supply pipe, a gas delivery ring connected therewith, nipples connected with said gas ring, Bunsen burners receiving gas from said nipples, means for supporting said burners at a distance from and independently of said nipples, and means controlling the flow of gas from said nipples, said means comprising a tapering valve fixed in each nipple, and a perforated valve seat carried by

said nipple and movable towards and from said valve.

20. In a gas light fixture, the combination with a gas delivery ring, nipples connected therewith, Bunsen burners receiving gas from said nipples, means for supporting said burners at a distance from and independently of said nipples, and a needle valve for each nipple, each needle valve comprising a tapering valve member fixed in said nipple and a cap nut adjustably mounted on said nipple, said nut having a tapering orifice cooperating with said tapering valve member.

21. In a gas light fixture, the combination of the gas supply pipe, the burners connected therewith, and an inclosing casing therefor including a hinged globe, and means for locking the globe in open position.

22. In a gas light fixture, the combination of the gas supply pipe, the burners connected therewith, and an inclosing casing therefor including a globe, a hinge connecting said globe to the body of the fixture and means associated with said hinge to lock the same in extended relation to hold the globe in open position.

23. In a gas light fixture, the combination of the main casing, a globe closing the bottom thereof, a hinge connecting the globe to the casing, a lug on one leaf of the hinge adapted to extend over the second hinge leaf when said hinge is extended, and a catch on the second leaf to engage said lug to lock the hinge and the globe in open position.

24. In an inverted incandescent gas lamp, a Bunsen burner including a tube polygonal in cross section having a series of lugs on opposite faces, a sleeve having internal screw threads to engage said lugs to adjust the tube longitudinally, and means for rotatably supporting said sleeve,

25. In an inverted incandescent gas lamp, a Bunsen burner including a tube polygonal in cross section having a series of spaced lugs on opposite faces, a sleeve having internal screw threads coöperating with said lugs to adjust said tube longitudinally, a supporting plate in which said sleeve is rotatably mounted, and a plate through which said tube projects, said plates serving to hold the burner in position and admit of the tube being raised or lowered.

26. In an inverted incandescent gas lamp, a Bunsen burner including a tube polygonal in cross section having a series of spaced lugs on opposite faces, a sleeve having internal screw threads coöperating with said lugs to adjust said tube longitudinally, a supporting plate in which said sleeve is rotatably mounted, a plate through which said tube projects, said plates serving to hold the burner in position and admit of the tube being raised or lowered, said latter plate having an opening to permit the passage of the tube, and a sliding plate having a similar opening surrounding the tube and adapted to be moved to cause the opening to register to release the tube or to cause opposite edges of the plates adjacent the openings to engage the tube.

27. In an inverted incandescent gas lamp, a Bunsen burner including a tube polygonal in cross section having a series of spaced lugs on opposite faces, a sleeve having internal screw threads coöperating with said lugs to adjust said tube longitudinally, a supporting plate in which said sleeve is rotatably mounted, a plate through which said tube projects, said plates serving to hold the burner in position and admit of the tube being raised or lowered, said latter plate having an opening to permit the passage of the tube, a sliding plate having a similar opening surrounding the tube and adapted to be moved to cause the opening to register to release the tube or to cause opposite edges of the plates adjacent the openings to engage the tube, and a lug on the tube to prevent the same dropping through the lower plate when the opening in the same is out of registry with that in the sliding plate.

28. In an inverted incandescent gas lamp, a Bunsen burner including a tube polygonal in cross section having a series of spaced lugs on opposite faces, a sleeve having internal screw threads coöperating with said lugs to adjust said tube longitudinally, a supporting plate in which said sleeve is rotatably mounted, a lower plate having an opening through which said tube projects and through which said tube may be removed, a slide plate having a similar opening, said opening being adapted to register, and a spring lug on said slide plate to engage the sleeve to lock the slide plate with the openings aforesaid out of registry.

29. In an inverted incandescent gas lamp, a burner tube comprising an upper section having an enlarged screw threaded foot, a tip having a similarly screw threaded portion, a screw threaded sleeve coöperating with the threads on the foot and tip to secure the same together and permit the tip to be adjusted with respect to the foot and mantle supporting lugs formed on said sleeve.

30. In a gas lamp, the combination of the supply pipe, the burner in communication therewith, a valve to control the flow of gas and an indicator stop for said valve comprising a spring pressed ball in the valve casing adapted to engage a slight depression in the body of the valve for a given position of the latter.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH MAAS.

Witnesses:
HENNA MEAD,
JOHN L. HOLLANDER.