

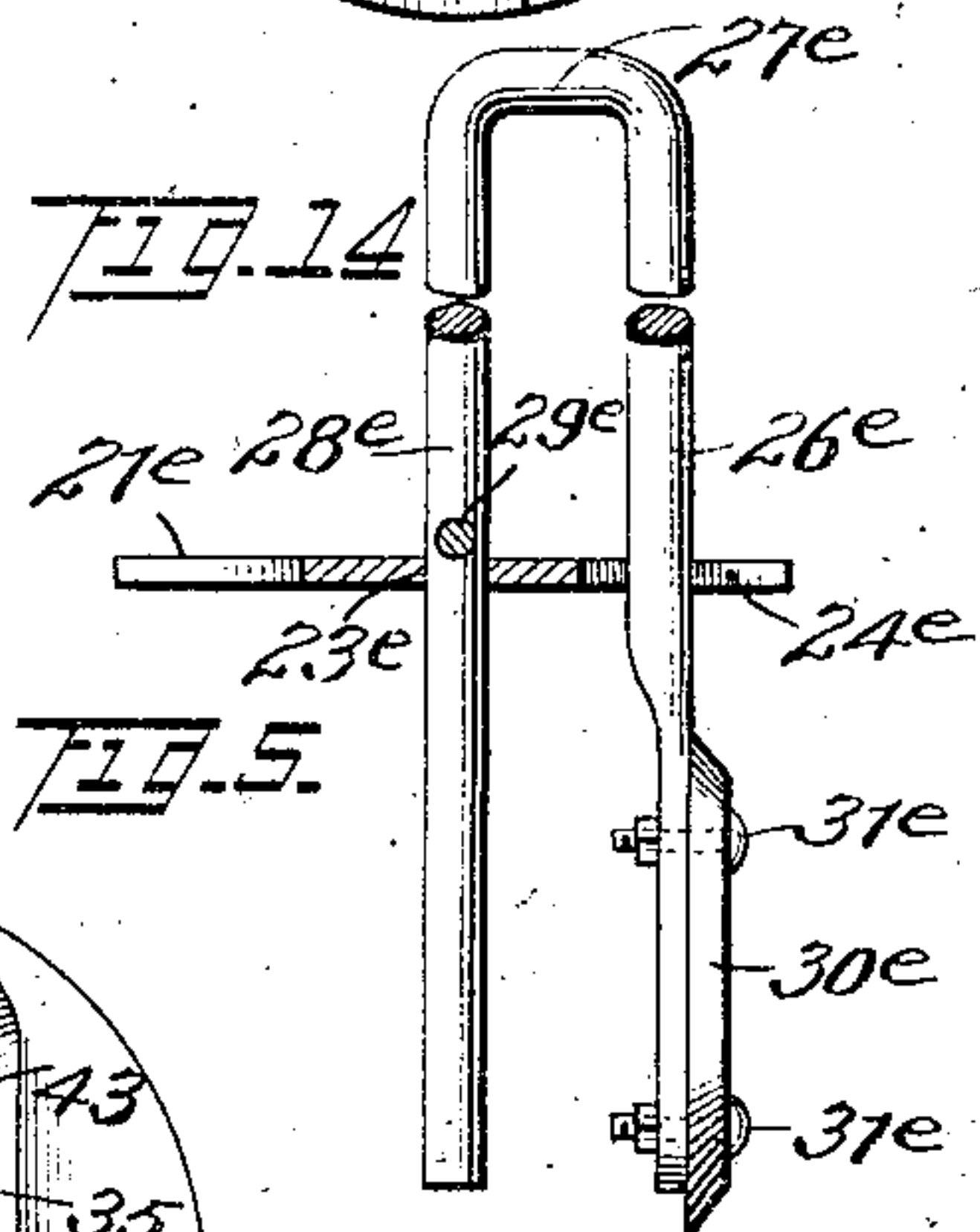
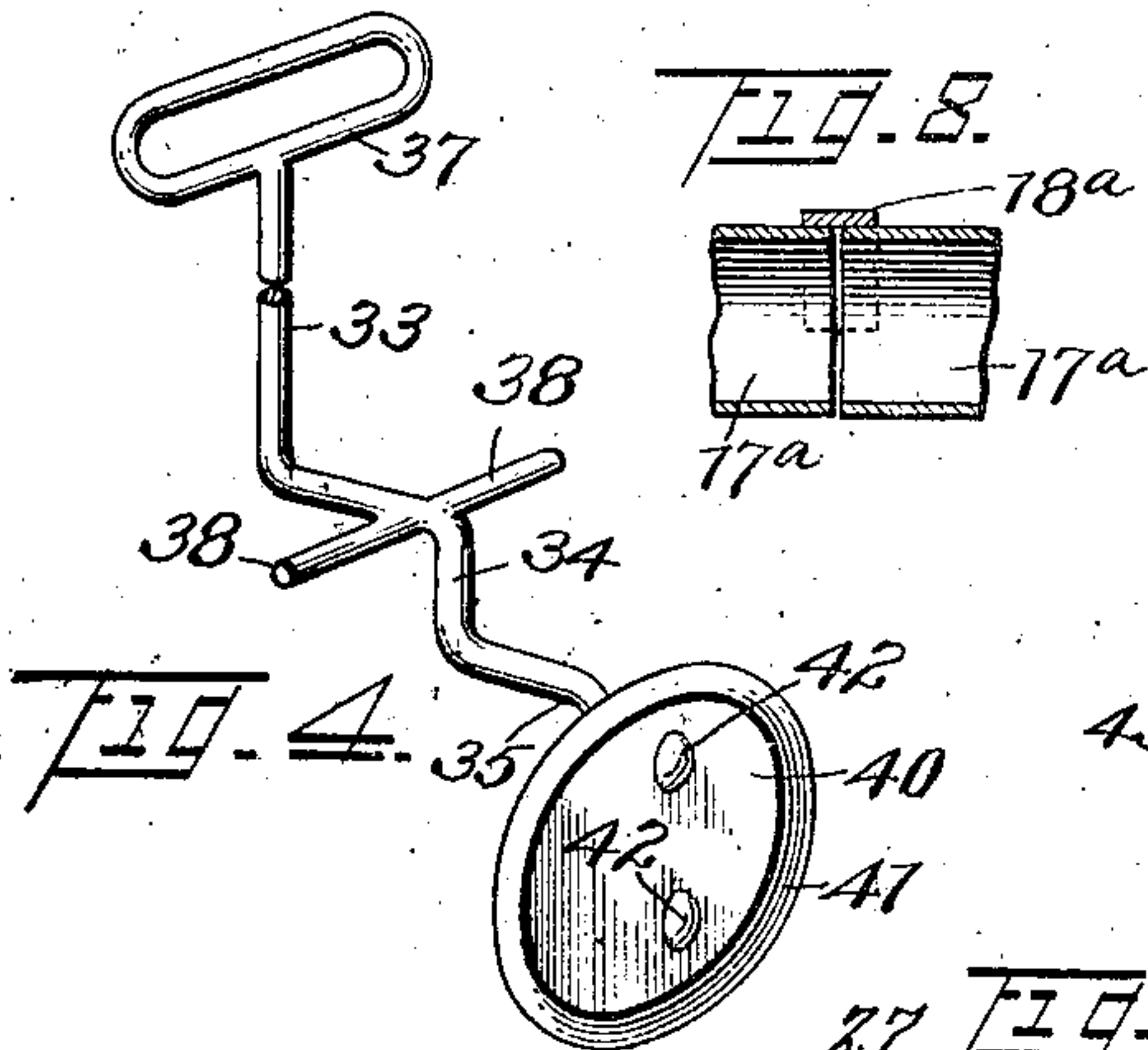
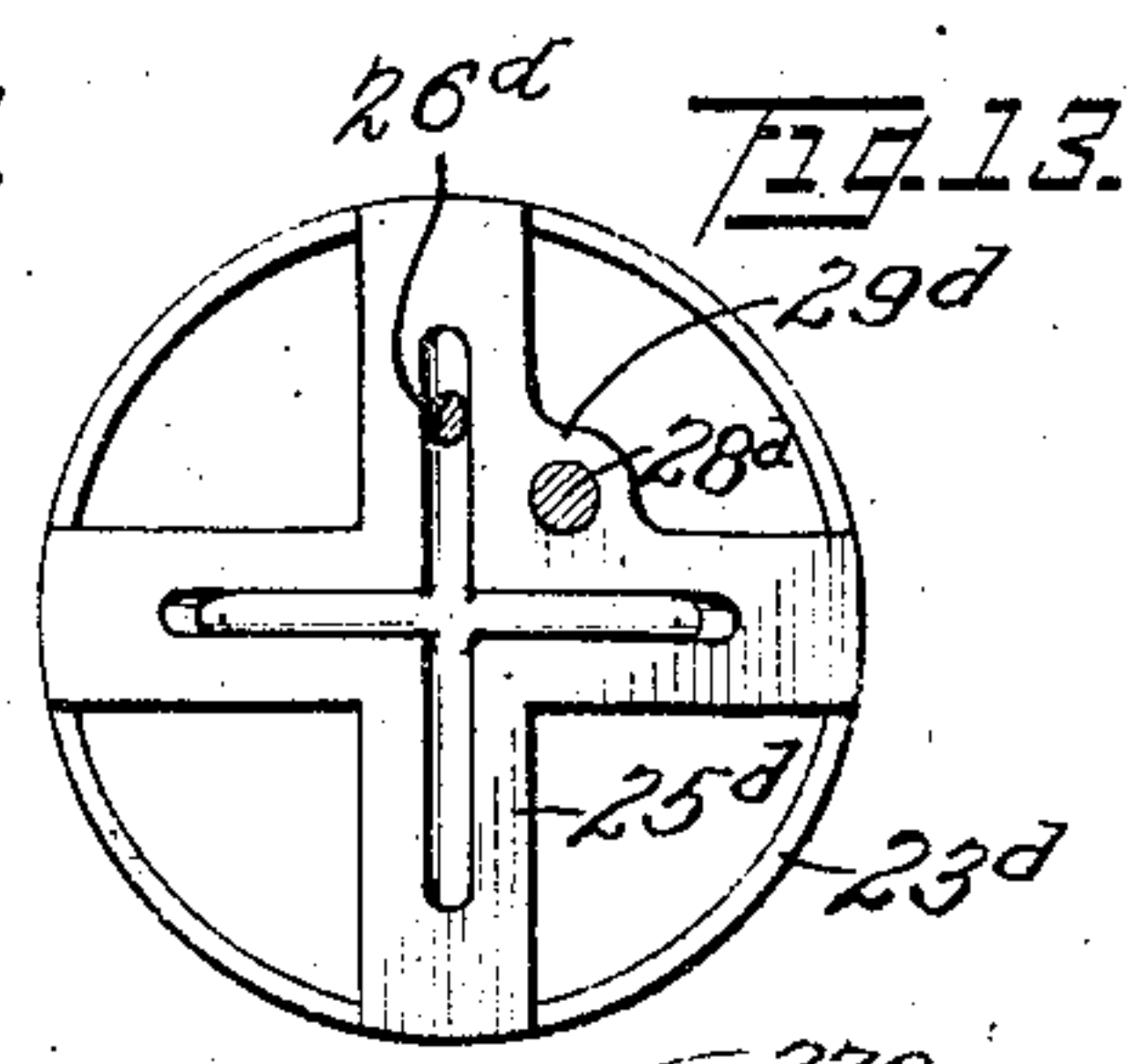
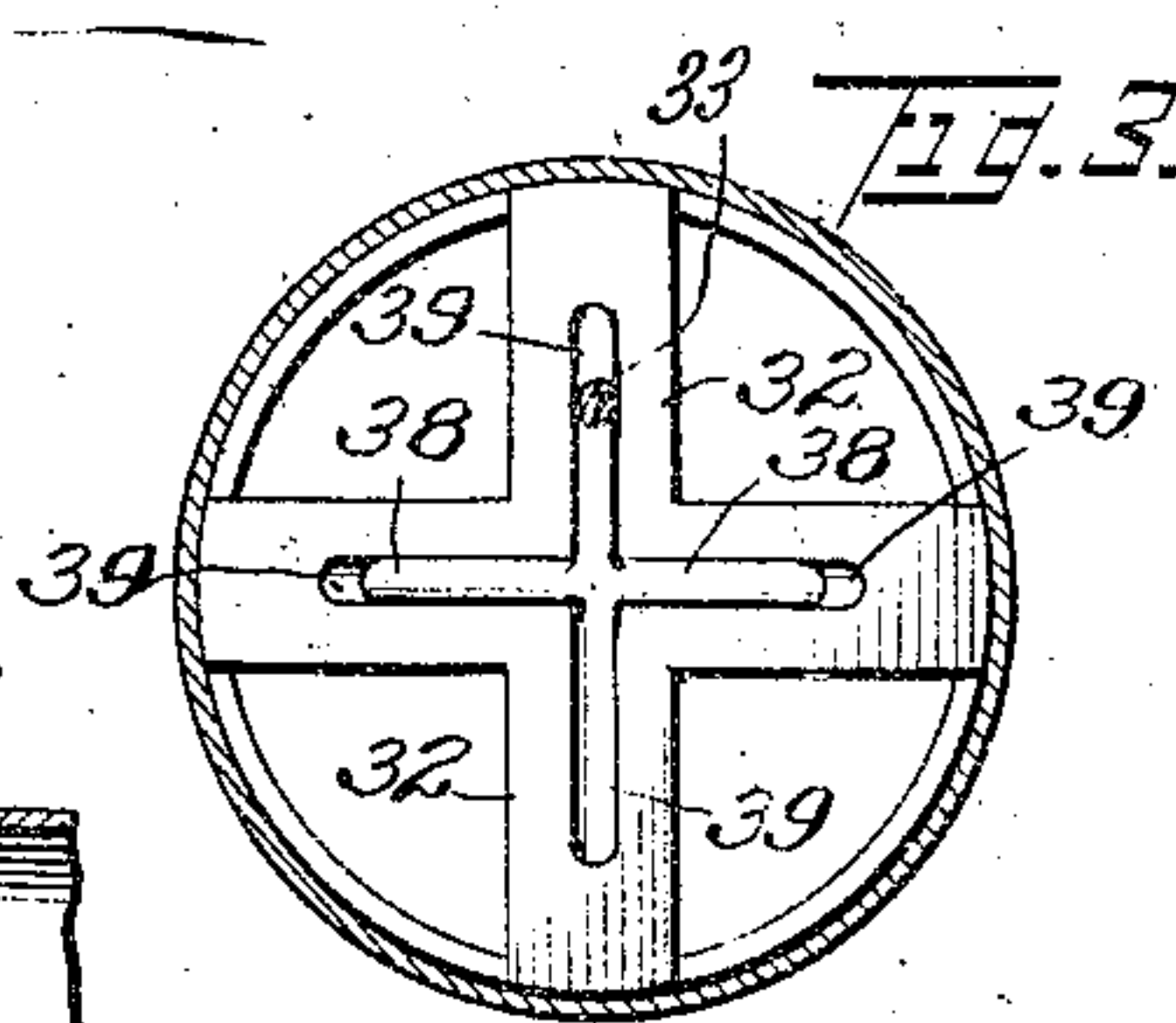
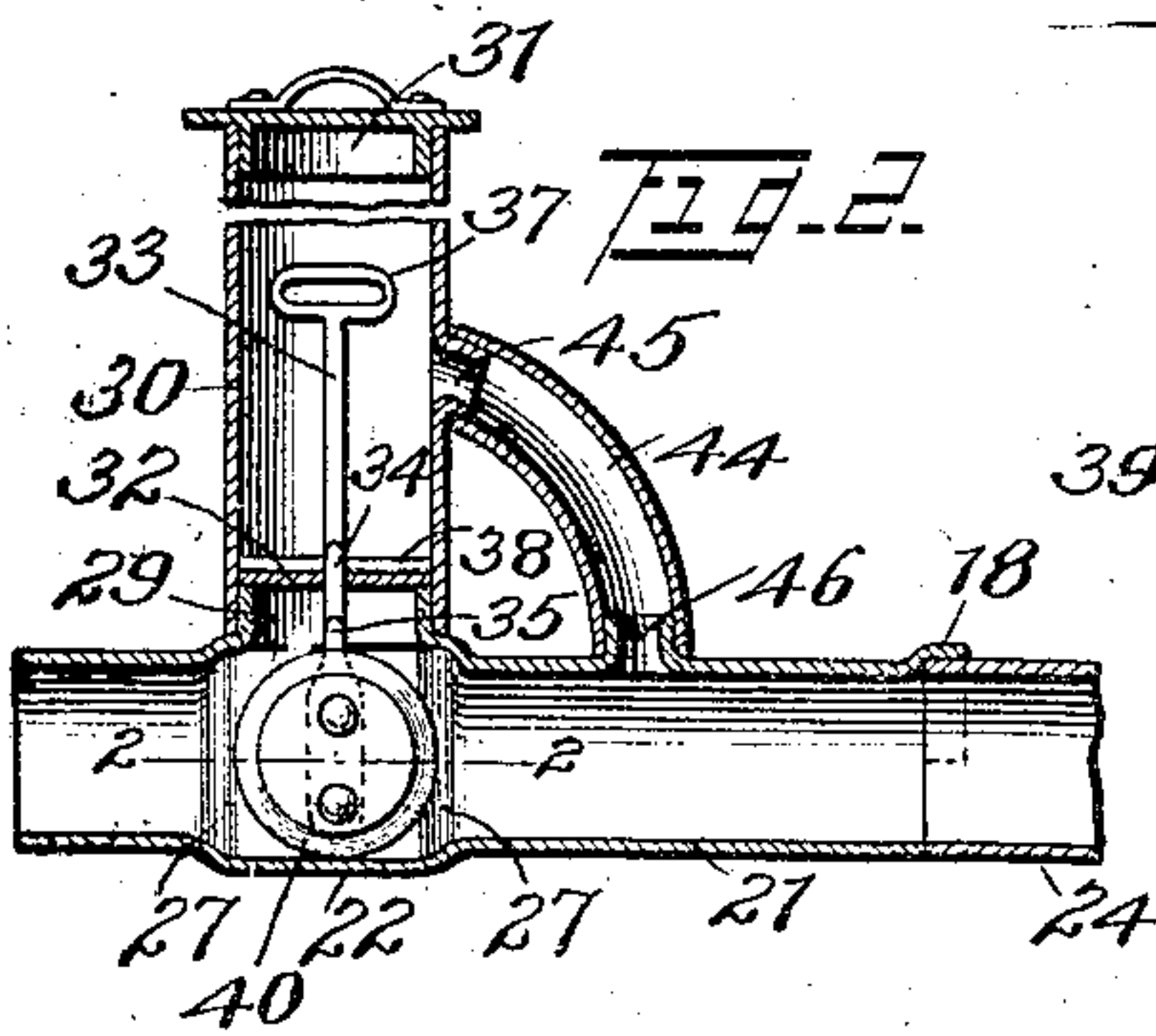
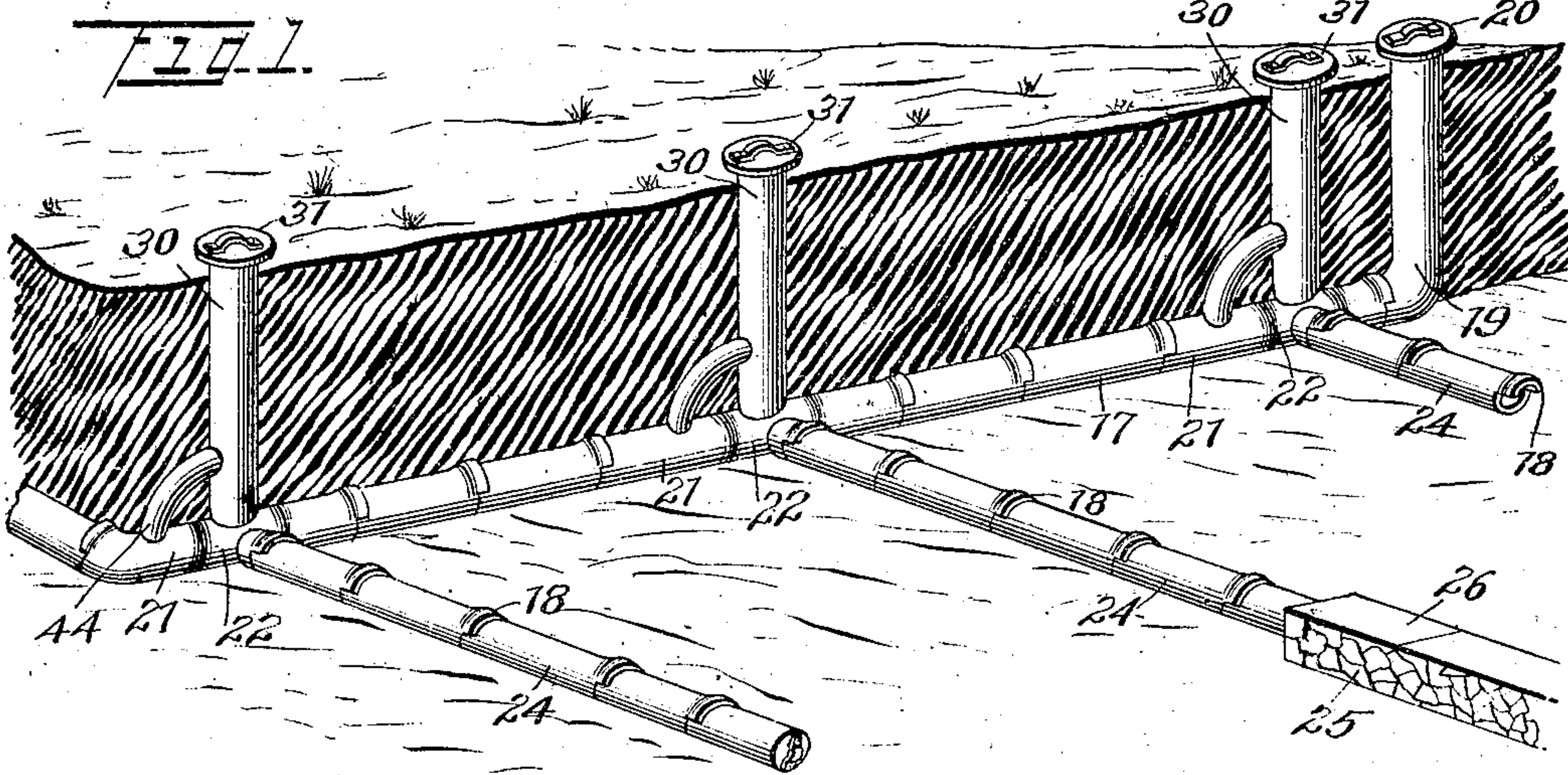
No. 862,276.

PATENTED AUG. 6, 1907.

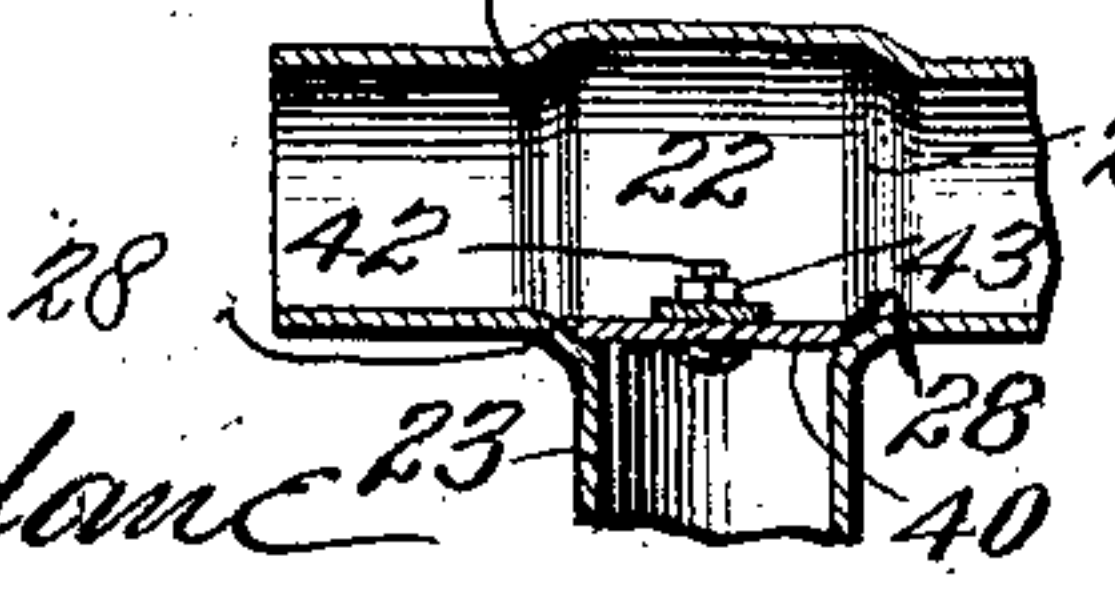
I. M. NEWMAN.
DRAINING AND IRRIGATING APPARATUS.

APPLICATION FILED JULY 17, 1896.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

FIG. 9.

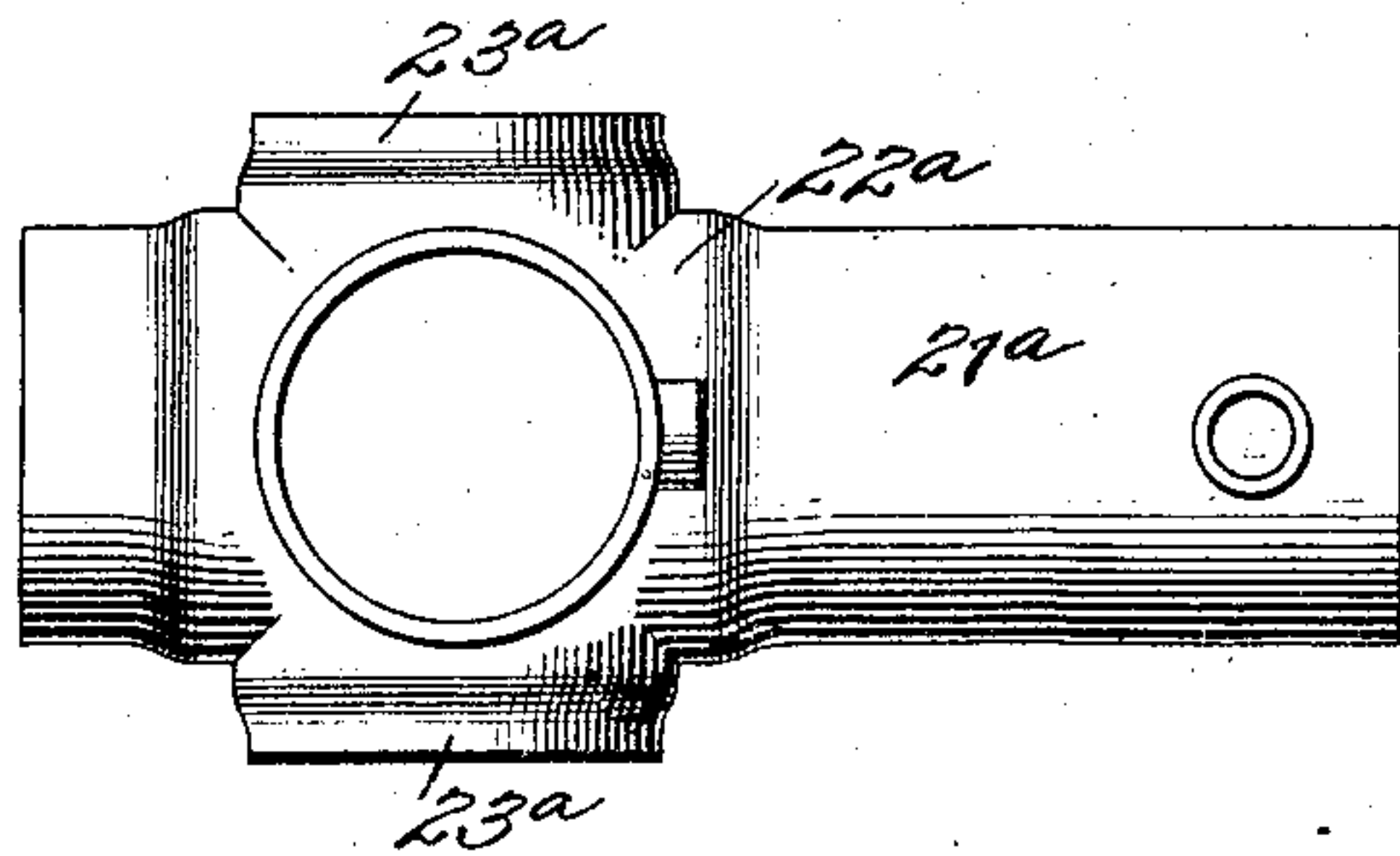


FIG. 15.

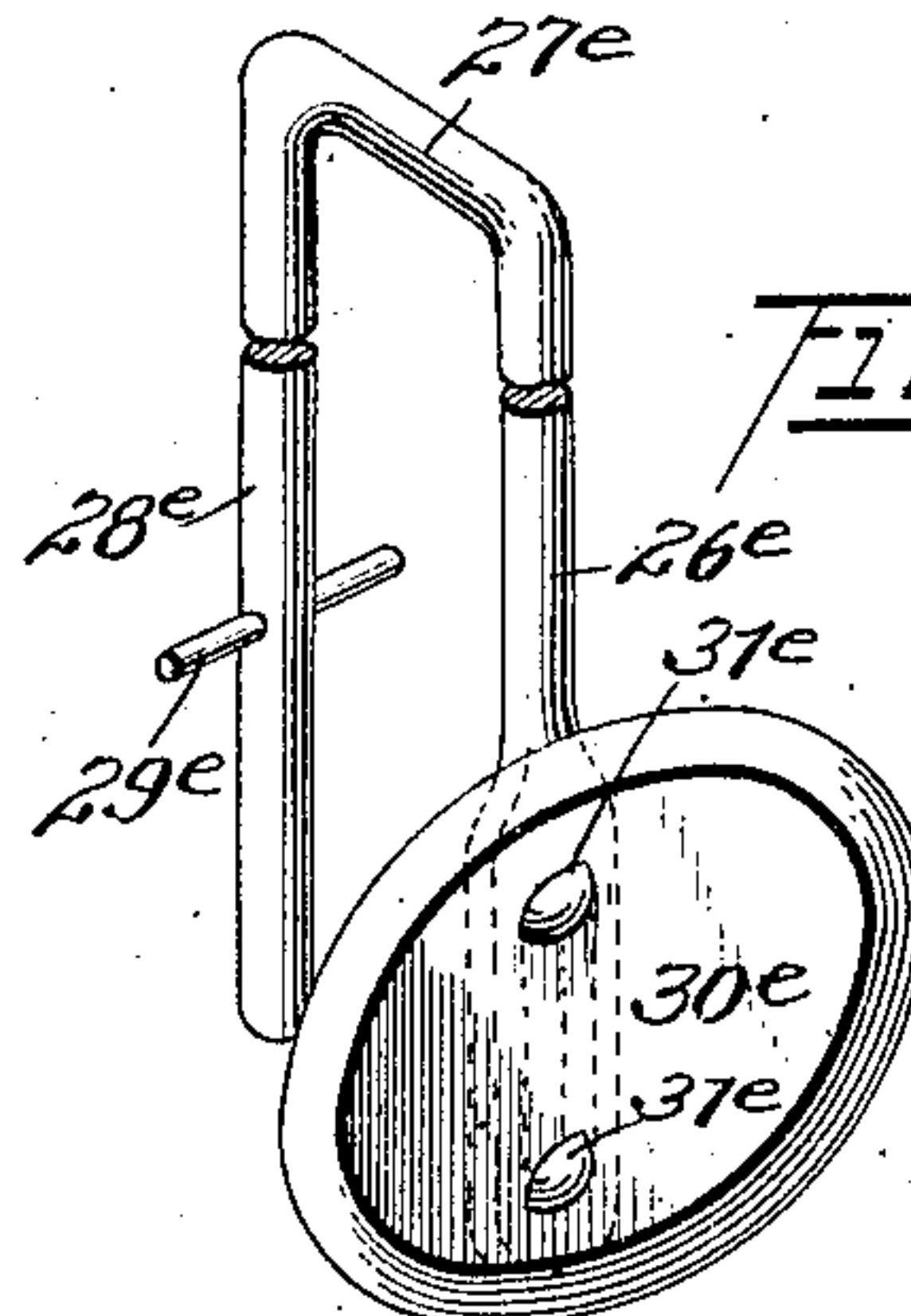
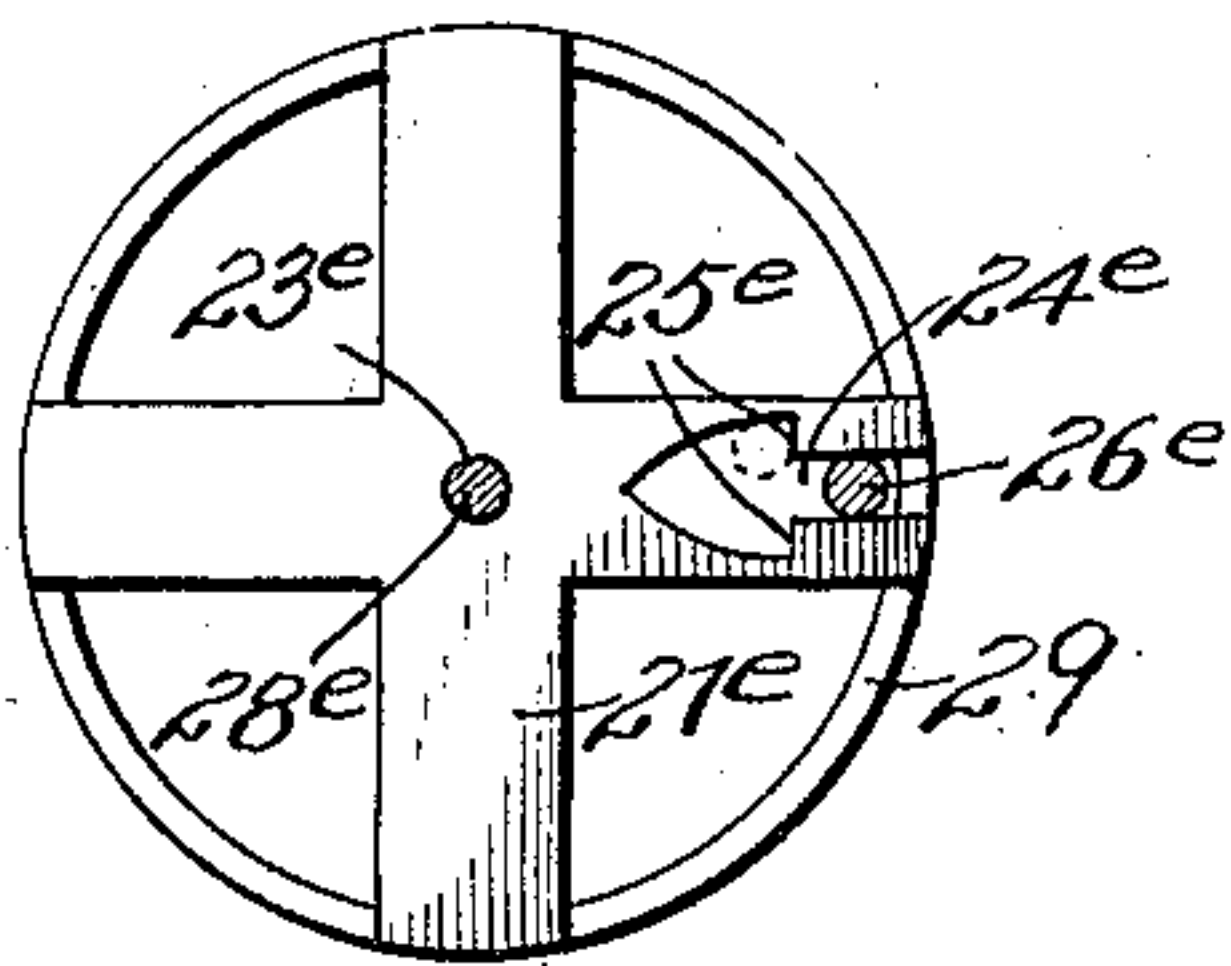


FIG. 16.

FIG. 10.

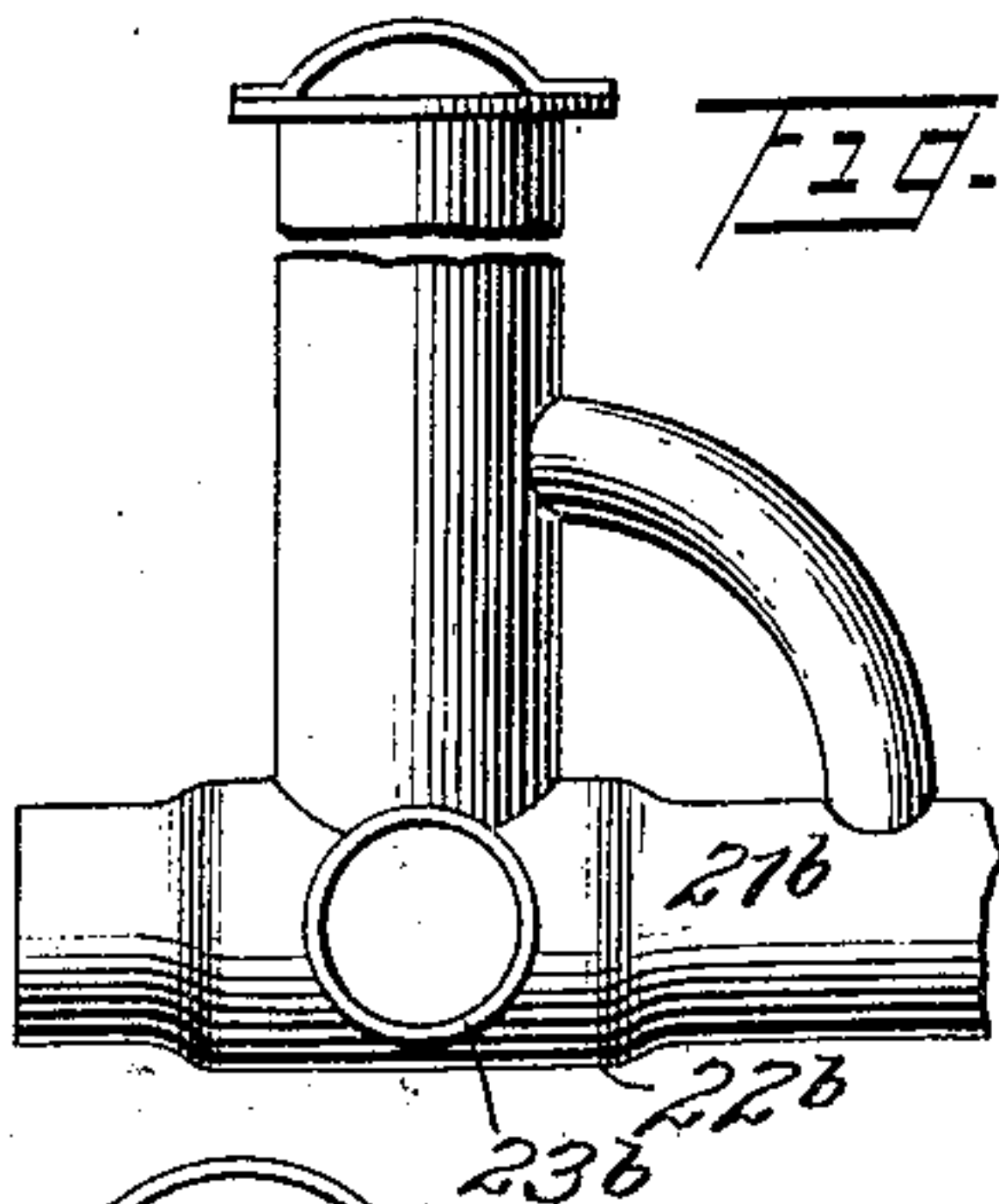


FIG. 11.

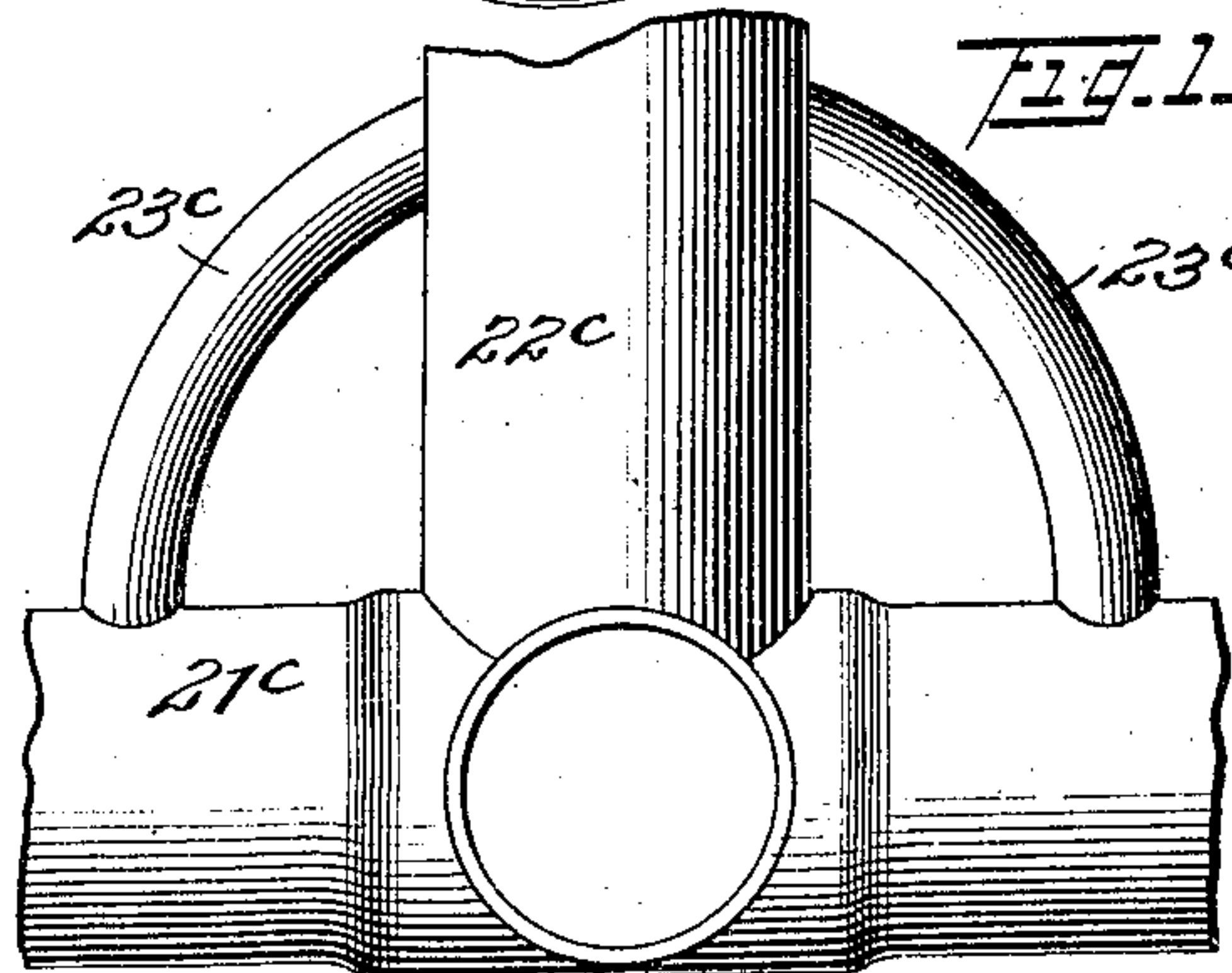
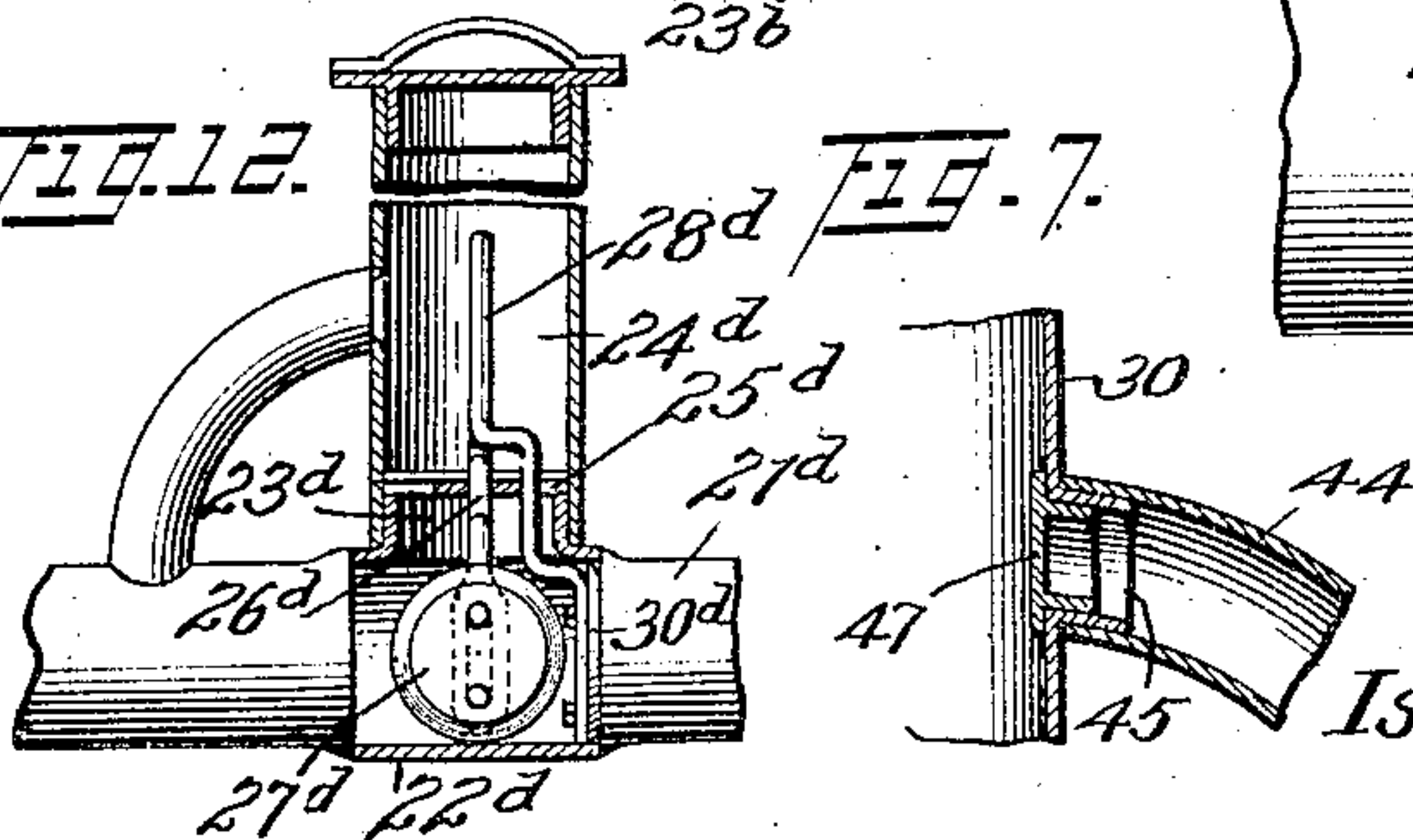


FIG. 12.

FIG. 7.



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DRAINING AND IRRIGATING APPARATUS.

No. 862,276.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed July 17, 1896. Serial No. 599,551.

To all whom it may concern:

Be it known that I, ISAAC M. NEWMAN, a citizen of the United States, residing near Hewins, in the county of Chautauqua and State of Kansas, have invented a new and useful Draining and Irrigating Apparatus, of which the following is a specification.

This invention relates to means for draining and irrigating land.

The principal object is to provide a novel apparatus or equipment which is placed below the earth's surface, so that it is out of the way and is arranged to drain the water out of the surface soil of wet lands and conduct water to land that is too dry, thereby draining one and irrigating the other.

A further object is to provide means in which water may be reserved so that in times of drought this water may be re-applied to the land from which it was taken.

Still another object is to provide means whereby the supply of water from or to different portions of the land may be controlled, as desired, thus keeping all parts in a proper condition and also preventing to a material degree the washing of the surface from constant rains which saturate the soil.

Embodiments of the invention that are at present considered preferable are disclosed in the accompanying drawings and are described in the following specification. An inspection of the claims will clearly show, however, that the said invention is not limited to the particular forms illustrated.

In the drawings: Figure 1 is a perspective view of a plat of land in which the system has been installed, portions thereof being broken away to illustrate said system. Fig. 2 is a sectional view through one of the controlling valve mechanisms or locks. Fig. 2^a is a horizontal sectional view on the line 2—2 of Fig. 2. Fig. 3 is a horizontal sectional view through the stand pipe. Fig. 4 is a detail perspective view of the valve and valve stem employed. Fig. 5 is a rear perspective view of the valve and the portion of the stem to which it is attached. Fig. 6 is a vertical sectional view there-through. Fig. 7 is a detail sectional view showing a closure for the overflow conduit. Fig. 8 is a detail sectional view showing a modified form of joint between two of the pipe sections. Fig. 9 is a top plan view of a modified form of coupling section. Fig. 10 is a side elevation of another type of coupling section. Fig. 11 is still another embodiment of a pipe coupling section. Fig. 12 is a vertical sectional view showing a double valve structure that may be employed. Fig. 13 is a top plan view thereof, the valve stems being shown in section. Fig. 14 is a detail view of another modification of the valve mechanism. Fig. 15 is a top plan view thereof, the valve stem being illustrated in section. Fig. 16 is a perspective view of the valve and stem shown in this modified structure.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

Referring first to the embodiment shown in Figs. 1 to 7, a main trunk conduit 17 is employed, that is preferably made up of a series of tiles, the ends of said tiles being abutted, one end of each having a flange 18, that overlaps the adjacent end of the other and extends over the top of the same but terminates short of the bottom or under portion, thus leaving cracks into or out of which water may pass. Instead of the integral flanges 18, the ends of the pipes 17^a may be abutted, as illustrated in Fig. 8, and the joints covered by separate strips 18^a. The manner of forming the joints is not, however, particularly important, and any means found suitable or desirable may be employed. The main trunk conduit 17 is located at an inclination, being preferably disposed on the slope of the hill, and at its upper end it is provided with an inlet stand pipe 19, the upper end of which extends a few inches above the ground and is covered by a suitable closure 20.

The conduit may be extended at its lower end either to a body of water or to some dry portion of land, and if the main part of said conduit is located in arid soil, water from any suitable source may be supplied to the conduit through the inlet 19.

The main trunk conduit is provided at suitable distances with coupling pipe sections 21, having enlarged intermediate portions 22, which portions are provided with lateral and substantially horizontal nipples 23. Connected to the main trunk conduit through said nipples are lateral branch conduits 24, that are horizontally disposed and are preferably made up of tiles or other pipes. If desired, however, portions or all of the lateral conduits may be constructed of broken stone or the like, as shown at 25 in Fig. 1, and covered with slabs 26. Any well known type of drain may thus be provided, as will be apparent. The enlarged portions of the coupling pipe sections 21 form annular shoulders within said pipe sections and these shoulders constitute valve seats 27 and 28, the valve seats 27 surrounding the passageway through the conduit and the valve seats 28 surrounding the inner ends of the nipples 23.

The enlarged portions of the coupling sections 21 are preferably provided with upstanding nipples 29, and these nipples are surrounded by the lower ends of stand pipes 30, projecting a few inches above the surface of the ground and closed by suitable caps 31. The upper ends of the nipples 29 constitute means for supporting spiders that comprise cross arms 32, the ends of which rest upon said nipples. These spiders, in turn, constitute supports and journal bearings for valve stems 33, having intermediate portions 34, that rotatably and slidably pass through central openings in the spiders, the lower ends 35 of the stems being offset and provided with slots 36, the upper

ends being also offset and having handle grips 37. Cross arms 38 carried by the valve stems at the upper ends of the journal portions 34 are adapted to rest upon the spiders, and the arms of said spiders have longitudinally disposed grooves 39, adapted to receive the cross arms. Secured to the lower slotted ends of the stems are valves 40, preferably in the form of disks, having beveled margins 41, and secured in place by bolts 42, that pass through said valves and through the slots 36 in the stems. Nuts 43, threaded upon the bolts, clamp the valves in place and the slots permit the vertical adjustment of said valves. Overflow conduits 44 in the form of elbows are employed, the upper ends of these conduits receiving nipples 45, formed in the stand pipes, the lower ends fitting over upstanding nipples 46, carried by the pipe coupling sections 21 and located on the opposite sides of the valve seats therein from the stand pipes.

The trunk conduit disclosed is preferably located at one side of a plat or field that is to be drained or irrigated, the said trunk being placed at any desirable distance below the surface of the ground and at an inclination so that the water will flow freely from the inlet stand pipe 19 downwardly toward the outlet end. The desired number of lateral or branch conduits are then laid in horizontal position across the field and communicate with the inclined main trunk through the coupling sections already described. The valves are placed in position within the various coupling pipes, and after the pipes have been covered, the apparatus is ready for operation. If the soil is saturated with moisture and it is desired to drain the same, said valves are placed in inoperative positions so that water will freely flow down the trunk conduit and can pass without obstruction from the branches into the same. If, however, it is desired to cut off any of the branches from the main trunk, it is only necessary to raise the valve stem slightly and holding the hand grip 37 centrally within the stand pipe, turn the stem until the valve is opposite to the valve seat at the inner end of the nipple with which said branch is connected. Upon dropping the valve stem, the cross arms 38 will be received in certain of the grooves 39, of the spider and said cross arms will act as fulcrums, the weight of the handle portion being the power and forcing the valve against the seat, thus closing the inlet. It will be observed that when so closed, the main trunk is not obstructed in any manner and the water can freely pass the closed end of the branch. If, on the other hand, it is desired to turn the stream of water from the trunk into any of the lateral or branch conduits, the valve is placed across the main trunk conduit just below the nipple, whereupon the water flowing down the conduit will turn into the branch desired. On the other hand, if it is found necessary to shut off the water above a branch, the same valve can be turned against the upper valve seat 27, all of which it is thought will be clearly apparent. The conduits may, furthermore, be made to act as reservoirs in which case, the valves are placed across the trunk conduit. Water will thereupon collect in the conduits and be retained thereby until the land, drying out, will absorb the same and thus the supply will be automatically replenished. If an excess of water should collect, the level thereof will rise in the stand pipes until it reaches the overflow conduits, whereupon

it will pass through the various sections and finally find an outlet through the discharge end of the main trunk. In some cases, it may be found desirable to close these overflow conduits, in which case, suitable caps 47 may be employed, which, as shown in Fig. 7, are introduced into the nipples 45 of the stand pipes 30.

In the system or apparatus disclosed in Fig. 1, the branch pipes are shown as extending from one side only of the main trunk. They may, however, be connected to both sides, in which case, coupling pipes 21^a, shown in Fig. 9, will be employed, having enlarged portions 22^a with lateral nipples 23^a, located on opposite sides. Furthermore, coupling pipes 21^b, illustrated in Fig. 10, may be employed for securing single connections on the opposite sides of that shown in Fig. 1. These pipes will each have an enlarged portion 22^b and a single lateral nipple 23^b. Otherwise, the structure is the same as that already disclosed. Coupling sections may furthermore be provided with double overflows. Such a structure is disclosed in Fig. 11, wherein the pipe is shown at 21^c and has supported thereon a stand pipe 22^c, from which extends offset overflow pipes 23^c, connected to the main trunk coupling pipe 21^c on opposite sides of the stand pipe. It may also be found desirable under some conditions to provide two valves in the coupling pipes, in order that both the main trunk conduit and the branches may be closed simultaneously. An arrangement of this character is shown in Figs. 12 and 13. The coupling pipe is shown at 21^d and has enlarged intermediate portions 22^d, together with an upstanding nipple 23^d. A stand pipe 24^d extends above the nipple and supported on said nipple within the stand pipe is a spider 25^d, comprising cross arms. Passing through the center of this spider is a valve stem 26^d, carrying at its lower end a valve 27^d. This valve and valve stem operate the same as the corresponding parts of the structure already described, and can be employed for closing either the main trunk or the lateral branch. Another valve stem 28^d is journaled in an intermediate portion 29^d at the juncture of two of the spider arms. This valve stem 28^d also carries at its lower end a valve 30^d, which is also permitted to have a limited movement so that it may be moved into and out of coaction with certain of the valve seats. This structure and the valve mechanism first described are considered preferable where the conduits are located comparatively deep in the ground. If, however, they are disposed near the surface of the soil, the mechanism illustrated in Figs. 14, 15 and 16 is employed, as it is believed to be better. A spider 21^e is rotatably mounted on the upper end of the nipple 29 of the ordinary coupling pipe, and this spider has a central opening 23^e, as well as a slot 24^e. The latter is formed longitudinally in one of the arms and has an enlarged inner end forming shoulders 25^e. The valve stem 26^e is substantially U-shaped and is of yielding material, the upper cross arm 27^e constituting a handle. One of the depending arms 28^e is inserted in the central opening 23^e, its downward movement being limited by a cross pin 29^e. The other arm is slidably mounted in the slot 24^e and terminates at its lower end in a head that is slotted. A valve 30^e is adjustably secured by bolts 31^e to this head and is movable into and out of the usual valve

seats of the coupling pipe. To change this valve from one seat to another, it is only necessary to spring stem 26^e back and engage it behind one of the shoulders, whereupon the valve is locked out of engagement 5 with the valve seat. The handle 27^e is then grasped and the entire device turned until the valve faces the desired seat. It is then released by disengaging the stem from the shoulder, whereupon said valve will spring into the seat and thus close the desired conduit.

10 From the above it will be seen that a comparatively simple structure is provided which will perform the two-fold function of a drain and an irrigator, will act as a storage reservoir for water and will constitute means whereby soil may be kept in proper condition.

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

1. In a system of the character described, the combination with a pipe section having a nipple on one side between its ends, of valve seats formed about the inner end 20 of the nipple and about the interior of the pipe section contiguous to the juncture of the nipple therewith, and valve mechanism cooperating with the seats to close the nipple and the passageway through the pipe section.

2. In an apparatus of the character described, a pipe 25 section having an enlarged portion between its ends, a nipple on one side of said enlarged portion, valve seats formed upon shoulders between said enlarged portion and the extension of the section therefrom in one direction and between the enlarged portion and said nipple, and a tubular extension upon a side of said enlarged portion 30 in position to assume a vertical position when said pipe section is laid with the said nipple in position to connect with a lateral branch conduit.

3. Valve mechanism for use in apparatus of the character described, consisting of a pipe section having an enlarged portion between its ends and a nipple on one side 35 of said enlarged portion, and valve seats formed upon the shoulders between said enlarged portion and the extension of the section therefrom in one direction and between the enlarged portion and said nipple, in combination with a stand pipe in communication with said enlarged portion 40 and nipple to assume a vertical position when said pipe section is laid with said nipple in position to connect with a lateral branch conduit, a conduit connecting said stand pipe with the above mentioned extension of the 45 pipe section, and a valve adapted to seat upon either of said seats.

4. In apparatus of the character described, the combination with a main conduit comprising a pipe section having 50 an enlarged portion between its ends and a nipple on one side of said enlarged portion, and valve seats formed upon the shoulders between said enlarged portion and the extension of the section therefrom in one direction and between the enlarged portion and said nipple, of a substantially upright stand pipe in communication with said 55 enlarged portion, a lateral branch conduit connected to said nipple, an overflow conduit connecting said stand pipe with the main conduit at a point on the opposite side of the valve seat therein from the stand pipe, and a valve adapted to seat on either of said seats. 60

5. In apparatus of the character described, the combination with a pipe section having a lateral offset leading therefrom, a valve seat in its length and a valve seat 65 surrounding said lateral offset, of a stand pipe connected to said section between said seats, a valve adapted to be moved toward and from and to seat upon either of said seats, a valve operating lever connected to said valve, and a plurality of bearings within said stand pipe upon either of which said lever may be fulcrumed.

70 6. In apparatus of the character described, the combination with a trunk conduit disposed at an inclination, of a plurality of horizontally disposed branches connected thereto at different levels and allowing the passage of water both toward and from the trunk conduit, and 75 common means located at the juncture of the trunk con-

duit and branches for controlling the passage of water through the trunk conduit, from said trunk conduit into the branches, and from the branches into the trunk conduit.

7. In apparatus of the character described, the combination with water-conducting means including a trunk conduit and a branch conduit connected thereto, of a plurality 80 of upright valve seats surrounding the passageways through the conduits, a stand pipe located contiguous to the juncture of the conduits, an upright valve stem located in the stand pipe, means in the pipe for supporting the stem in a plurality of positions, and an upright 85 valve carried by the stem and movable to positions across the trunk conduit and across the branch conduit.

8. In apparatus of the character described, the combination with water-conducting means including a trunk conduit and a branch conduit connected thereto, of a stand 90 pipe located contiguous to the juncture of the conduits, a rotatable valve stem having an intermediate bearing in the stand pipe and having offset terminals, and a valve carried by one of said terminals and rotatable with the stem. 95

9. In apparatus of the character described, the combination with water-conducting means including a trunk conduit and a branch conduit connected thereto, of a stand 100 pipe located contiguous to the juncture of the conduits, a valve stem having a cross arm supported within the stand pipe, said cross arm being movable to different positions, and a valve carried by the lower end of the stem. 105

10. In apparatus of the character described, the combination with a conduit having an upstanding nipple, of a plurality of valve seats arranged in the conduit at different 110 sides of the lower end of the nipple, a rotatable valve stem passing through the nipple, said valve stem also having a lateral swinging movement, a valve carried by the lower end of the stem and rotatable therewith to different angular positions in order to coact with the different seats upon 115 the lateral swinging movement of the stem, and a support for the stem located on the nipple.

11. In apparatus of the character described, a conduit having an upstanding nipple and spaced oppositely disposed valve seats, a stand pipe extending above the nipple, 120 a rotatable valve stem passing through the nipple, a valve carried by the lower end of the stem and rotatable therewith, and a support for the stem including cross arms located in the nipple. 125

12. In apparatus of the character described, the combination with a trunk conduit including sections having laterally disposed nipples and upright nipples, said sections having enlarged portions arranged at the nipples, forming 130 valve seats, branch conduits connected to the lateral nipples, a stand pipe surrounding each of the upright nipples, overflow pipes connecting the stand pipes and the trunk conduit, valve stem supports located within the stand pipes and resting on the nipples, valve stems carried by the supports and having offset lower ends, and valves secured to 135 the lower ends of the stems, said valves being movable into cooperative relation with the said seats and constituting means for controlling the passage of water between the trunk conduit and the branch conduits and through said trunk conduit. 140

13. In an apparatus of the character described, the combination with a conduit having a branch, of angularly disposed valve seats located within the conduit, a substantially flat rotatable valve located in the conduit and movable into coaction with the different seats, and a rotatable 145 stem carrying the valve. 150

14. In apparatus of the character described, the combination with a conduit having a branch, of angularly disposed valve seats located within the conduit, a substantially flat rotatable valve located in the conduit and movable into coaction with the different seats, and a rotatable 155 and swinging stem carrying the valve and having a portion disposed in transverse relation to said valve.

15. In apparatus of the character described, the combination with a coupling section having an enlarged portion, of a branch conduit connected to one side of the enlarged 160 portion, angularly disposed valve seats in the enlarged portion surrounding the passageways through the coupling section and the branch conduit, and a valve movable in said enlarged portion into coaction with the different valve

seats, said valve when in coaction with the valve seat of the branch conduit being disposed at one side of the passageway through the coupling section.

5 16. In apparatus of the character described, the combination with a coupling section having an intermediate enlarged portion, of oppositely disposed valve seats located at the ends of the same, a branch conduit connected to one side of the enlarged portion and having a valve seat located therein, an upright nipple connected to the upper
10 side of the enlarged portion, a rotatable and swinging valve stem extending downward through the nipple, and a

valve carried by the lower end of the stem, said stem being disposed transversely of the valve, the valve being movable into coaction with the different valve seats, and when in coaction with the valve seat of the branch conduit being
15 disposed at one side of the passageway through the coupling section.

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