K. JAGSCHITZ.

GAS RESERVOIR.

APPLICATION FILED JULY 31, 1914.

**1,275,696.**

Patented Aug. 13, 1918.

4 SHEETS—SHEET 1.

Fig. 1

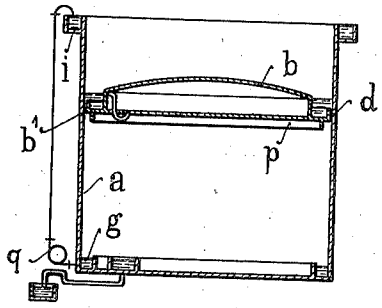



Fig. 2

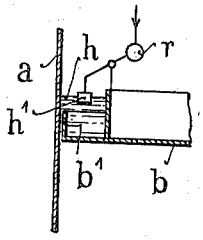



Fig. 3

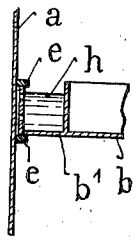



Fig. 4

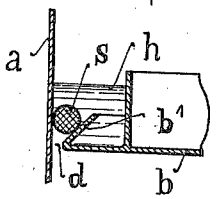



Fig. 5

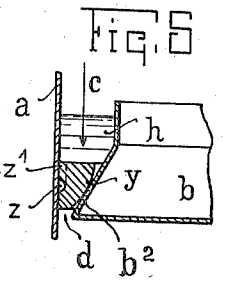



Fig. 7

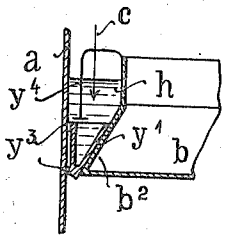



Fig. 8

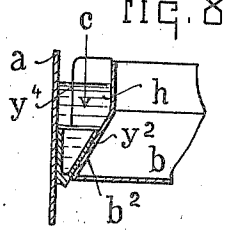
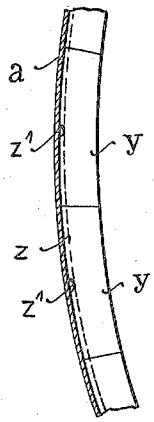



Fig. 6




Witnesses:

August Deininger

Hermann Aumüller.

Inventor:

Konrad Jagschitz

By Brisen & Kraus

Attorneys.

K. JAGSCHITZ.

GAS RESERVOIR.

APPLICATION FILED JULY 31, 1914.

1,275,696.

Patented Aug. 13, 1918.

4 SHEETS—SHEET 2.

Fig. 9

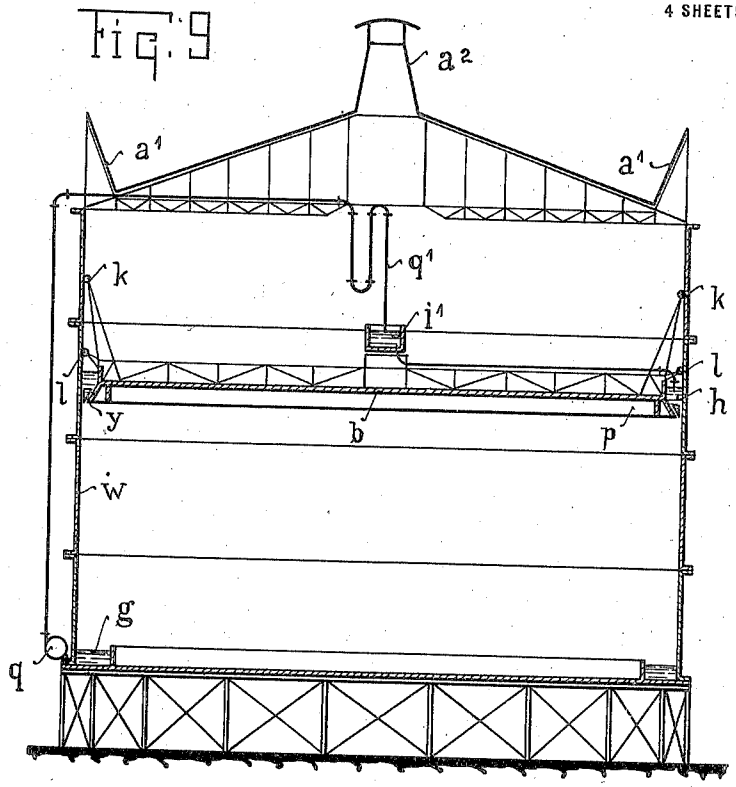
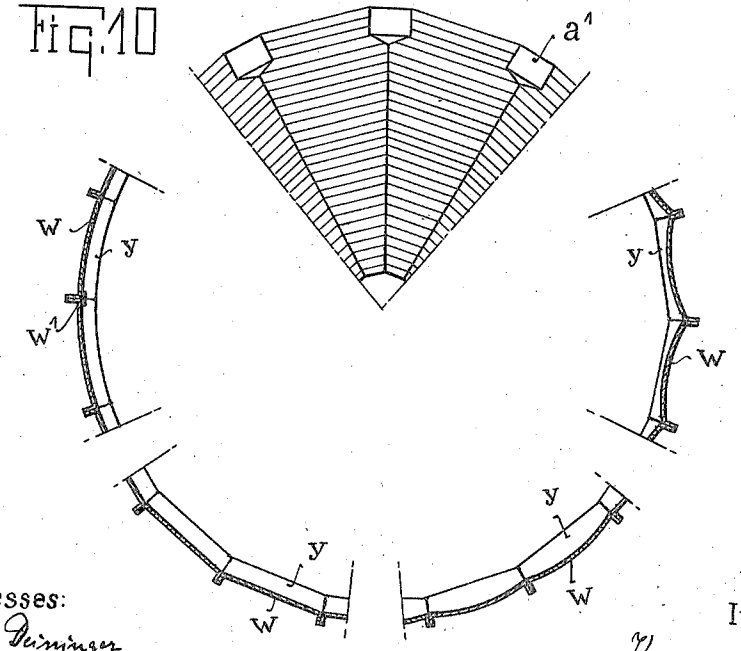



Fig. 10




Witnesses:

August Deininger

Hermann Aumüller

Inventor:

By Konrad Jagschitz

Bowen & Whittemore

Attorneys

K. JAGSCHITZ.

GAS RESERVOIR.

APPLICATION FILED JULY 31, 1914.

1,275,696.

Patented Aug. 13, 1918.

4 SHEETS—SHEET 3.

Fig. 11

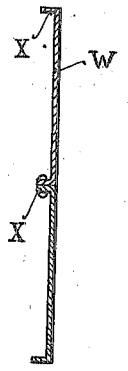



Fig. 12

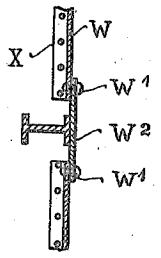



Fig. 13

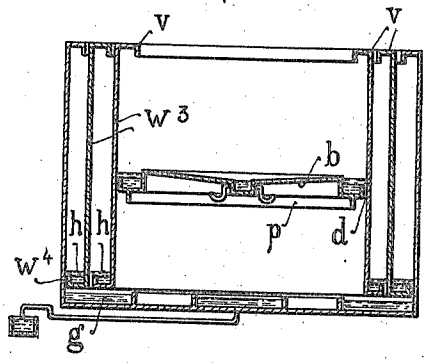



Fig. 14

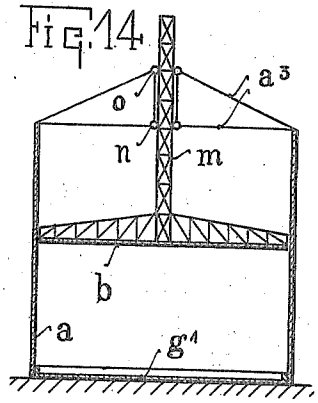



Fig. 15

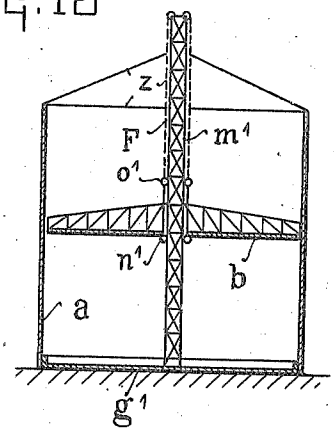
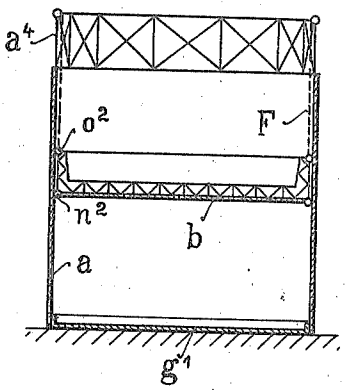



Fig. 16




Witnesses:

August Deininger

Hermann Aumüller

Inventor:

By Konrad Jagschitz

Bonsall Wright

Attorneys

K. JAGSCHITZ.

GAS RESERVOIR.

APPLICATION FILED JULY 31, 1914.

1,275,696.

Patented Aug. 13, 1918.

4 SHEETS—SHEET 4.

Fig. 17

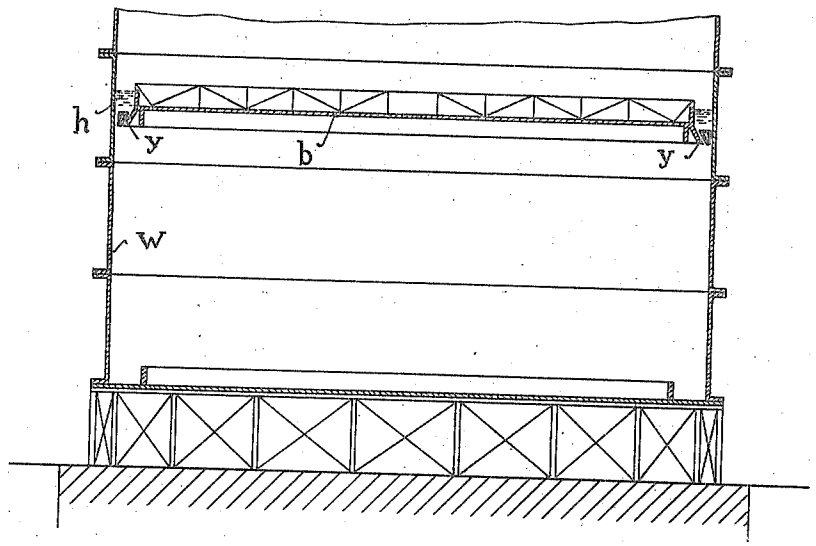
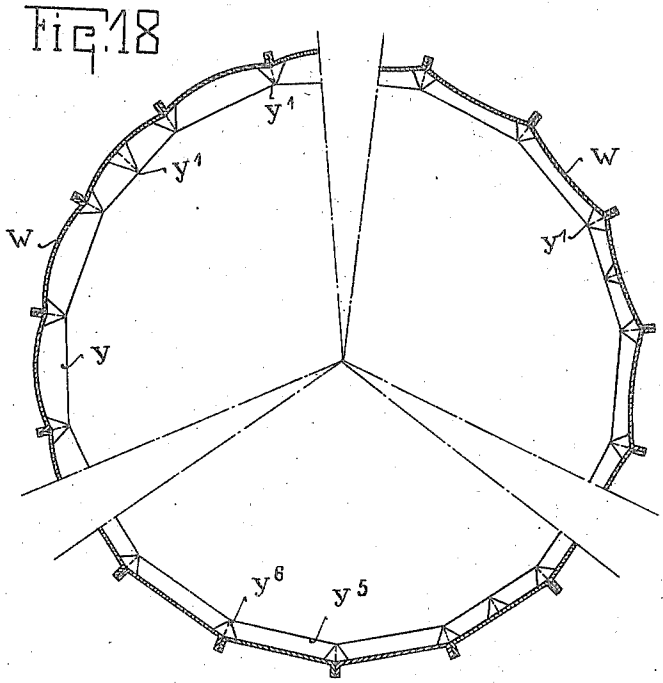



Fig. 18




Witnesses:

August Deininger

Hermann Kumüller

Inventor:

By Konrad Jagschitz

Breese & Knauth

Attorneys

# UNITED STATES PATENT OFFICE.

KONRAD JAGSCHITZ, OF MAINZ, GERMANY, ASSIGNOR TO MASCHINENFABRIK AUGSBURG-NÜRNBERG, A. G., OF NÜRNBERG, GERMANY, A CORPORATION OF GERMANY.

## GAS-RESERVOIR.

1,275,696. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed July 31, 1914. Serial No. 854,243.

*To all whom it may concern:*

Be it known that I, KONRAD JAGSCHITZ, a subject of the Emperor of Austria, and resident of No. 27 Weintorstrasse, at Mainz, Germany, have invented certain new and useful Improvements in Gas-Reservoirs, of which the following is a specification.

My invention relates to storage reservoirs for gas and the like in which an adjustable closure is utilized to seal the reservoir against the atmosphere. The type of closure almost exclusively used at the present time necessitates the employment of a bell arranged to dip into a water basin containing a supply of water and thus prevent the escape of the gases. This type of closure has two very material disadvantages; first it makes it necessary to inclose the supply of sealing fluid throughout its entire height with double walls, that is the side wall of the bell and the wall of the basin; second owing to the pressure of the sealing fluid which exists in such constructions the basin wall must be made very heavy and strong. These two disadvantages have resulted in attempts to use what might be termed dry seals in which the use of a sealing fluid is obviated for the purpose of doing away with the high fluid pressure and the consequent necessity for the double walls above mentioned. In actual practice up to the present it has been found impossible to satisfactorily make use of such dry seals because the same are unreliable, and owing to the fact that they quickly wear away must be continuously and minutely watched to prevent leakage of gas, which watching operation is difficult of satisfactory performance on account of the arrangement and location of such seals.

The present invention has for its object to provide a structure including a fluid seal in which the necessity for the double walls and the relatively large supply of sealing fluid is entirely avoided without sacrificing any of the advantages or incurring any of the disadvantages of existing types of sealing devices.

My improvement further contemplates using the adjustable closure or sealing disk temporarily as a working scaffold when erecting the reservoir and after the completion of the same to arrange said disk as a closing or sealing medium.

Other objects of my invention will appear from the description hereinafter and the features of novelty will be pointed out in the appended claims.

Reference is to be had to the accompanying drawings in which Figure 1 is a diagrammatic vertical section of a gas reservoir including an example of my improvement; Figs. 2, 3, 4, 5, 6, 7 and 8 are detail sections showing different forms of the same; Fig. 9 is a view similar to Fig. 1 of still another variation of my invention; Fig. 10 is a diagrammatic plan view thereof partly in section; Figs. 11 and 12 are detail views respectively in vertical and horizontal section of a method of connecting the reservoir plates; Fig. 13 is a vertical section of a telescopic reservoir with my improvement applied thereto; Fig. 14 is a view similar to Fig. 1 of still another arrangement; Fig. 15 is a view of the form shown in Fig. 14 showing the adjustable closure or sealing disk in temporary use as a working scaffold; Fig. 16 is a similar view of another arrangement for the same purpose; and Figs. 17 and 18 are diagrammatic vertical and horizontal sections of another form of reservoir construction.

As illustrated in the drawings my improvement consists in providing a disk shaped closure vertically movable within a reservoir as the volume of gas in the latter changes, and provided throughout its periphery with a fluid seal in engagement with the inner surface of the reservoir. The fluid seal is carried by and movable with said disk shaped closure and is of comparatively small height and volume and thus does not exert any appreciable pressure on the reservoir wall which in consequence may be relatively light and thin in construction. This is in contradistinction to the fluid seal in present constructions which must correspond in height to the height of the customary bell in order to work properly and consequently must exert a heavy pressure on the surrounding walls. With the present arrangement a small space exists between the disk shaped closure and the reservoir wall through which a small amount of the sealing fluid continuously trickles and runs down along the wall of said reservoir. This escaping fluid, in my improvement, is collected in any suitable manner at the bottom

of the reservoir and again pumped up and returned to the closure so that said fluid travels in a continuous circular path and is continuously utilized. Any suitable fluid such as water may be employed as the sealing medium, although I prefer to use a thick, viscous fluid having a low freezing point such as for instance gas-tar, oil or the like or any suitable combination thereof. Such fluids flow very slowly so that the trickling through the space above mentioned would be retarded and very slow and consequently reduced to a minimum. The reservoir itself may be constructed of any suitable material as for instance thin metallic plates, masonry or a combination of both or of concrete, ferro concrete with or without metal covering or any other suitable substance.

Referring more particularly to Fig. 1 of the drawings $a$ is the reservoir in which the disk shaped closure $b$ is vertically movable as the volume of gas therein increases or decreases. The periphery of said closure $b$ is shaped to form a trough $b'$ slidable lengthwise of the inner surface of the reservoir and containing the sealing fluid $h$ arranged to engage said inner surface and by means of which the reservoir is at all times sealed against the atmosphere. Whatever sealing fluid $h$ trickles through the space $d$ between the trough $b'$ and the wall of the reservoir $a$ flows downwardly along said wall and may be collected in the annular channel $g$ located at the bottom of said reservoir. From the channel $g$ this fluid may be pumped back or raised by means of the pump $q$ into an annular channel $i$ located at the upper edge of the reservoir from which it may be conducted back to the trough $b'$ in any suitable and convenient manner. The closure $b$ is further provided with a depending annular flange $p$ adapted, in the lowermost position of the said closure, to extend into the fluid contained in the channel $g$ and thus properly seal the reservoir when the latter is substantially empty.

The height of the fluid $h$ in the trough $b'$ varies in proportion to the gas pressure which is present. If it is desired to maintain the flow of fluid through the space $d$ as low as possible it is preferable to arrange the height of the fluid $h$ so that the bottom pressure thereof is only slightly greater than the gas pressure, less the adhesive effect of said fluid in the space $d$. In order to properly regulate the quantity of sealing fluid which periodically flows or is conducted back to the trough $b'$ and thus maintain the height of said fluid in said trough $b'$ at a substantially fixed point a float $h'$ may be arranged in the fluid $h$ in the well known manner as shown in Fig. 2 for the purpose of actuating the valve $r$ which controls the flow of the fluid back to the said trough $b'$.

In order to decrease the fluid loss through the space $d$ as much as possible any variety of devices may be utilized some of which are illustrated in Figs. 3 to 8 inclusive. In the form shown in Fig. 3 preferably circumferential sealing strips $e$ in sliding engagement with the inner surface of the reservoir $a$ and carried by the trough $b'$ are employed, said strips $e$ consisting of jute or any other suitable sealing or packing material, such as used for instance in connection with disk pistons.

In Fig. 4 the peripheral wall of the trough $b'$ is arranged obliquely to the reservoir wall and annular sealing rolls $s$ are located in the space between said peripheral wall and the reservoir wall. These rolls $s$ coöperating with the oblique wall of the trough $b'$ are firmly pressed against the reservoir wall to seal the space $d$ either by their own weight or gravity, by the pressure of the fluid $h$ exerted thereon or by means of suitably arranged springs.

In the arrangement shown in Figs. 5 and 6 the trough $b'$ is omitted from the closure $b$ and the lower portion of the latter is inclined downwardly toward the reservoir wall as indicated at $b^2$. A series of approximately wedge shaped members $y$ are arranged end to end to form a complete annular member and are slidable on said inclined portion $b^2$ into firm engagement with the reservoir wall. These slide members $y$ are displaceable or movable relatively to each other and thus automatically adjust themselves to all variations or inequalities in the form of the reservoir wall and thereby reduce the space $d$ to a minimum at all times even during the actuation of the closure $b$. In order to still further reduce the fluid loss through the space $d$ the members $y$ may be provided with circumferentially or lengthwise extending grooves $z$ communicating with the fluid $h$ by means of channels $z'$ whereby an additional fluid seal is formed in the said grooves $z$. The rear or inner surfaces of the members $y$ may be smooth or also provided with grooves or if desired may be arched or convexed. The said members $y$ as well as the rolls $s$ above mentioned may be made of metal or any other material suitable for the intended purposes. The pressure exerted upon the upper surfaces $c$ makes it certain that the members $y$ will at all times produce a maximum sealing effect.

In Figs. 7 and 8 the members $y'$ and $y^2$ corresponding to the members $y$ are in the nature of upwardly open troughs of metal or any other suitable material having substantially a wedge shape in cross-section. The members $y'$ as shown in Fig. 7 are provided with sealing projections or strips $y^3$ extending circumferentially thereof and arranged to engage the wall of the reservoir $a$. If desired packing strips of felt, jute,

leather, metal net strips or other metallic packings may be introduced between the lower projections $y^3$ and the wall of the reservoir $a$. In the form shown in Fig. 8 the members $y^2$ are made with smooth outer surfaces, the projections or strips $y^3$ being omitted. In both forms the members $y'$ and $y^2$ are connected with the closure $b$ by means of resilient supports $y^4$ which exert a pressure on said members $y'$ and $y^2$ in a direction to augment the pressure of the sealing fluid $h$ and which also prevent said members $y'$ and $y^2$ from being raised to any substantial extent. Otherwise the construction of the closure and the operation and arrangement of these members $y'$ and $y^2$ may be the same as closure $b$ and the members $y$ of Fig. 5. The oblique peripheral wall of the trough $b'$ in Fig. 4 and the inclined portions $b^2$ of Figs. 5, 7 and 8 together with the wall of the reservoir $a$ form annular channels substantially wedge-shaped in cross-section as will be readily apparent from an inspection of these figures.

The present invention is equally well adapted to reservoirs with or without a roof. If the reservoir is open and without a roof some provision must be made for causing the deposits collected an the closure $b$ to flow off, any well known drainage devices being adopted for this purpose, as shown by way of example in Figs. 1 and 13.

Figs 9 and 10 illustrate a reservoir constructed of flanged plates and covered by a roof, the bottom of said reservoir being raised so that the space beneath the same may be used for any desired purpose. In the arrangement now being described the receiving channel $i'$ corresponding to the channel $i$ instead of being located at the upper edge of the reservoir $a$ is located on and carried by the closure $b$, and is connected with the pump $q$ by means of tubing or piping $q'$ the free end portion of which is preferably flexibly arranged so as to readily follow the movements of the channel $i'$. In this form of my invention the closure $b$ is guided in its vertical movement by means of rollers $k$ and $l$ arranged in pairs one over the other and mounted on supports carried by the closure $b$. The rollers $k$ and $l$ may travel directly along the inner surface of the plates $w$ or along special strengthening rails $w'$. In the highest position of the closure $b$ the upper rollers $k$ extend into roof extensions $a'$ so that it is unnecessary to make the reservoir wall any higher than actually required to produce a reservoir having the desired gas capacity. Ventilation of the interior of the reservoir may be secured by providing proper roof-extensions $a^2$, which at the same time may serve to accommodate the piping or tubing $q'$ in the highest position of the closure $b$. Fig. 10 clearly illustrates the employment of inwardly or outwardly arched plates for the reservoir wall and how, by correspondingly shaping the sealing members $y$, $y'$ or $y^2$ an effective seal may be secured.

In Figs. 11 and 12 an advantageous connecting arrangement for the individual plates comprising the reservoir wall is a diagrammatically illustrated in vertical and horizontal section respectively. In the arrangement shown each plate $w$ is provided with outwardly and horizontally extending flanges $x$ which stiffen and strengthen the structure and which are adapted to be connected together to secure the said plates in the form of the complete reservoir. The vertical connections between the plate $w$ comprise connecting plates or members $w^2$ extending throughout the reservoir $a$ and secured in position by rails which may correspond to the strengthening rails $w'$ hereinbefore mentioned and be used as guide rails for the rollers $k$ and $l$ to travel on.

In Fig. 13 I have illustrated the present invention applied to telescopic reservoirs. In this arrangement the sections $w^3$ composing the reservoir are each provided at one end with a trough $w^4$ similar to the trough $b'$ and likewise containing the sealing fluid $h$ and at the other end are provided with annular hooked flanges $v$ adapted to project into the fluid $h$ in each trough $w^4$ as the reservoir sections are fully extended and thus effectively seal the reservoir at these points. In the folded or in any intermediate position of the sections the sealing fluid $h$ performs its sealing functions in the same manner as described with regard to Fig. 1. The closure $b$ used with this form of reservoir may be substantially the same and operate the same as in said Fig. 1, with the addition that the trough $b'$ thereof is also adapted to receive the hooked flange $v$ of the innermost section $w^3$ when the closure $b$ is in its highest position. A channel $g$ for collecting the fluid $h$ which drips or trickles through the space $d$ is also provided at the bottom of the exterior section $w^3$ and serves the same purpose as the corresponding channel of Fig. 1. The closure $b$ may also be provided with a depending flange $p$ as and for the same purposes as in said Fig. 1.

Fig. 14 illustrates another arrangement for properly guiding the closure $b$ in its vertical movements. In this form the closure $b$ is provided with a rigid upright guiding column $m$ preferably constructed of metal and arranged to travel between guide rollers $n$ and $o$ journaled on the rafters or other suitable portions of the reservoir roof.

As shown in Fig. 15 the closure $b$ of Fig. 14 may be utilized preliminarily and temporarily as a working scaffold for the purpose of erecting the reservoir about the same and after completion of said reservoir is readily adapted for its intended sealing purposes. In carrying out this plan a lattice column

$m'$ is first temporarily erected and anchored at the bottom and if desired or found necessary also at the top by means of ropes, cables or the like. Upon this column $m$ the skeleton of the closure $b$ is mounted and provided with guide rollers $n'$ and $o'$ temporarily secured in position and whereby said skeleton is guided in its vertical movements along the column $m'$. A suitable tackle F is connected with the closure $b$ and with the column $m'$ and serves to raise the skeleton of said closure $b$ as the work of erecting the surrounding reservoir wall proceeds, the said skeleton being meanwhile employed as a scaffold or platform for the accommodation of the workman and necessary tools. This arrangement has the additional advantage that the wall of the reservoir may be constructed to accurately and properly fit about the closure $b$ and any and every inaccuracy in the form thereof, so that the space $d$ and the play in the seal, at all levels or heights is as small as possible.

Furthermore in the highest position of the closure $b$ after the reservoir has been built up to the desired height the guide structure $a^3$ and the supports for the rollers $n$ and $o$ as well as the roof if one is to be used may be easily placed in position and constructed. In like manner the bottom $g'$ may be constructed by loosely suspending the plates composing the same upon the closure $b$, and then riveting said plates together after which the completed bottom may be properly positioned upon the foundation masonry by lowering the closure $b$ and then releasing the bottom from the closure and again raising the latter out of the way.

After the closure has served its purpose as a scaffold the column $m'$ is released and secured to the closure and becomes the guide column $m$ of Fig. 14 while the rollers $n'$ and $o'$ are disconnected from the closure $b$ and mounted in the supports on the roof and thus become the guide rollers $n$ and $o$ of Fig. 14. After the tackle F and its coöperating parts have been disconnected and removed the structure is complete and ready for its intended uses.

In Fig. 16 the closure $b$ is guided along the reservoir walls by means of rollers $n^2$ and $o^2$ and may be initially used in a similar manner as an erection scaffold by providing the tackle F and attaching the same to the upper ends of wall parts $a^4$, or if desired a temporary lattice mast or derrick $m'$, hydraulic pressure or any other means be employed as a medium for raising and lowering the closure during its temporary use as a scaffold. In this form also the closure is finally adapted for its intended purposes by removing the tackle F or other actuating medium.

In applying the present invention to reservoirs of polygonal ground plan the advantage is derived that the sealing members $y$ may be maintained of prismatic, relatively cylindrical form. In order to secure an effective seal at the vertically extending corners or angles of such polygonal reservoirs, wedge or pyramid shaped sealing elements may be introduced at these edges or angles between the ends of the adjacent prismatic sealing members hereinbefore described to secure a substantially continuous outer sealing surface in engagement with all portions of the inner surface of the reservoir. Several examples of such arrangement are shown in Figs. 17 and 18 in which the reservoir wall is constructed either of straight, or arched plates $w$ as in Fig. 10 and sealing members $y^5$ similar to the members $y$, $y'$ or $y^2$ are located between said wall and the closure $b$ as herein previously set forth. Between the ends of each adjacent pair of members $y^5$ at the vertical angles or corners of the reservoir a wedge shaped or pyramid shaped element $y^6$ is introduced as shown in Fig. 18, thus securing an effective seal at these points. With the employment of arched plates in the construction of the reservoir, such wedge or pyramid shaped intermediate elements may also be employed not only at said angles, but also at other points of the arched plates for instance at the center.

It will of course be understood that any of the described forms and arrangements of fluid seals may be included in the structures shown in Figs. 14, 15 and 16 and also that the various forms of seals may be adapted to the various forms of reservoirs and closures.

Aside from the advantages so far recited herein the present invention has the still further advantage that a heating of the sealing fluid to prevent freezing or congealing thereof is unnecessary, for the reason that with the small volume or quantity of sealing fluid which differentiates the present improvement from the fluid seals now in use, a fluid having a low freezing point may be used with the result that the usual heating apparatus may in consequence be omitted.

In addition to this with reservoirs as at present constructed and utilizing fluid seals the objection is present that in making repairs to the water basin or in the interior of the reservoir it is necessary to first completely drain off the basin water which during use becomes saturated with poisonous gases and then thoroughly rinse the interior of the reservoir with fresh water and with fresh air before said repairs can be made with safety. This objection is entirely avoided in the present construction. Furthermore by reducing the volume of sealing fluid to a minimum the foundation and other parts of the structure are relieved

from excessive pressure whereby the cost of construction and maintenance is materially reduced.

The present improvement also simplifies the erection of the reservoir and other parts of the apparatus by making it possible to readily use the closure as a temporary scaffold or centering for the accommodation of working tools and workmen.

Various changes in the specific forms shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. The combination of a reservoir, a closure slidable along the inner surface thereof and a fluid seal in said reservoir having no effective portion below the sealing point whereby the joint is sealed between said closure and said inner surface.

2. The combination of a reservoir, a closure movable therein and a fluid sealing medium carried entirely by said closure and having no effective portion below the sealing point, said sealing medium engaging the inner surface of said reservoir whereby the joint between said closure and said inner surface is sealed.

3. The combination of a reservoir, a closure movable therein, an annular peripheral trough carried by said closure and slidable along the inner surface of said reservoir, and a fluid sealing medium carried entirely by said trough and engaging the inner surface of said reservoir whereby the joint between said closure and said inner surface is sealed.

4. The combination of a reservoir, a closure slidable along the inner surface thereof, a fluid sealing medium carried entirely by said closure and engaging said inner surface and means for collecting the fluid medium which trickles through the space between the closure and said inner surface below the sealing point.

5. The combination of a reservoir, a closure slidable along the inner surface thereof, a fluid sealing medium carried entirely by said closure and engaging said inner surface, a collecting channel located at the bottom of said reservoir for collecting the fluid medium which trickles through the space between the closure and said inner surface and an outlet leading from said collecting channel.

6. The combination of a reservoir, a closure slidable along the inner surface thereof, a fluid sealing medium carried by said closure and engaging said inner surface, a collecting channel located in said reservoir for collecting the fluid medium which trickles through the space between the closure and said inner surface and means for returning said collected fluid medium to said closure.

7. The combination of a reservoir, a closure movable therein, an annular peripheral trough carried by said closure and slidable along the inner surface of said reservoir, a fluid sealing medium in said trough and engaging said inner surface, a collecting channel located in said reservoir for collecting the fluid medium which trickles through the space between said trough and said inner surface and a pump for returning said collected fluid medium to said trough.

8. The combination of a reservoir, a closure slidable along the inner surface thereof, a fluid sealing medium carried entirely by said closure and engaging said inner surface, an annular collecting channel at the bottom of said reservoir for collecting the fluid medium which trickles through the space between said closure and said inner surface and an annular flange depending from said closure and adapted to extend into the fluid medium in said collecting channel to form a seal when the closure is in its lower position.

9. The combination of a reservoir, a closure slidable along the inner surface thereof, a fluid seal located between said closure and said inner surface and guide rollers carried by said closure and traveling lengthwise of the reservoir wall.

10. The combination of a reservoir, a closure slidable along the inner surface thereof, a fluid seal carried entirely by said closure whereby the joint between said closure and said inner surface is sealed and means for retarding the trickling of said fluid seal through said joint.

11. The combination of a reservoir, a closure movable therein, an annular peripheral trough carried by said closure and slidable along the inner surface of said reservoir, circumferential sealing strips carried by said trough and engaging said inner surface and a fluid sealing medium in said trough and engaging said inner surface.

12. The combination of a reservoir, a closure movable therein and provided with a peripheral surface inclined downwardly toward the inner surface of said reservoir, a sealing member located between said inclined peripheral surface and said inner surface and a fluid sealing medium located between said closure and said inner surface and above said sealing member.

13. The combination of a reservoir, a closure movable therein, the inner surface of said reservoir and the peripheral surface of said closure forming an annular channel wedge-shaped in cross-section, a sealing member vertically slidable in said channel and a fluid sealing medium located in said channel.

14. The combination of a reservoir, a closure movable therein, the inner surface of said reservoir and the peripheral surface of

said closure forming an annular channel wedge-shaped in cross-section, a sealing member of approximately wedge shape in cross-section located in said channel and a fluid sealing medium in said channel.

15. The combination of a reservoir, a closure movable therein, the inner surface of said reservoir and the peripheral surface of said closure forming an annular channel wedge-shaped in cross-section, a sealing member of approximately wedge-shape in cross-section located in said channel, said member being provided with grooves extending circumferentially thereof and with upwardly open channels communicating therewith and a fluid sealing medium in said wedge-shaped channel adapted to flow through said upwardly open channels into said grooves.

16. The combination of a reservoir, a closure movable therein, the inner surface of said reservoir and the peripheral surface of said closure forming an annular channel wedge-shaped in cross-section, a trough-like sealing member of approximately wedge-shape in cross-section located in said channel and a fluid sealing medium in said channel and in said sealing member.

17. The combination of a reservoir, a closure movable therein, the inner surface of said reservoir and the peripheral surface of said closure forming an annular channel wedge-shaped in cross-section, a trough-like sealing member of approximately wedge-shape in cross-section located in said channel, sealing strips extending circumferentially of said sealing member and a fluid sealing medium in said channel and in said sealing member.

18. The combination of a reservoir comprising a series of telescopic sections, annular troughs at one end of said sections, a fluid sealing medium in said troughs engaging the inner surfaces of said sections, hook-shaped flanges at the other ends of said sections adapted to extend in to the fluid medium in said troughs when the sections are fully extended, a closure movable in the inner section, an annular trough carried by said closure and slidable along the inner surface of said inner section, a fluid sealing medium in said closure trough engaging said inner surface and a hook-shaped flange on said inner section adapted to extend into the sealing fluid in said closure trough in the raised position of said closure.

19. The combination of a reservoir composed of a plurality of plates, outwardly extending horizontal flanges on said plates adapted to be secured together for connecting said plates and for stiffening same, vertical extending connecting members, rails extending lengthwise of said members, means securing said rails, members and plates together, a closure slidable along the inner surface of said reservoir, a fluid seal carried by said closure and engaging said inner surface and guide rollers carried by said closure and arranged to travel along said rails.

20. The combination of a closure, a reservoir wall surrounding said closure and means for raising and lowering said closure whereby the latter may be temporarily used as a working scaffold during the erection of the reservoir.

21. The combination of a closure, a reservoir wall surrounding said closure, means for raising and lowering said closure whereby the latter may be temporarily used as a working scaffold during the erection of the reservoir and means for guiding said closure in its movements.

22. The combination of a polygonal reservoir, a closure movable therein, an annular peripheral trough carried by said closure and slidable lengthwise of the inner surfaces of said reservoir, a series of sealing members in said trough in engagement with the inner surfaces of said polygonal reservoir, wedge or pyramid shaped members inserted between the ends of adjacent sealing members whereby the latter are connected and a substantially continuous outer sealing surface in engagement with the inner surfaces of said reservoir is formed and a fluid sealing medium in said trough and engaging said inner surfaces.

23. The combination of a reservoir, a closure movable therein, an annular peripheral trough carried by said closure and slidable lengthwise of the inner surface of said reservoir, a series of sealing members in said trough in engagement with said inner surface, insert members adapted to be inserted between the ends of adjacent sealing members whereby a substantially continuous outer sealing surface in engagement with said inner reservoir surface is secured and a fluid sealing medium in said trough in engagement with said inner surface.

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

KONRAD JAGSCHITZ.

Witnesses:
JEAN GRUND,
CARL GRUND.