

No. 778,506.

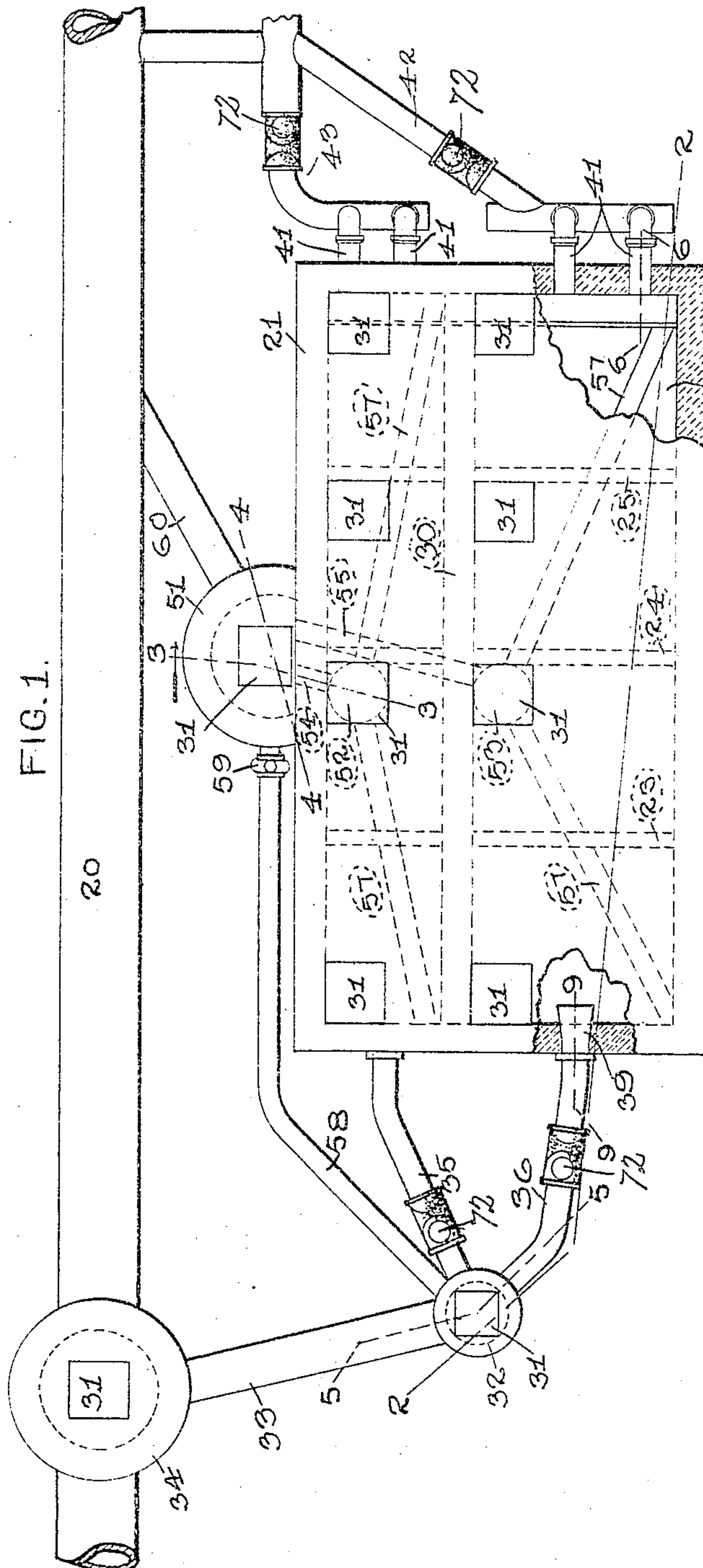
PATENTED DEC. 27, 1904.

W. A. REID & E. J. HANLEY.

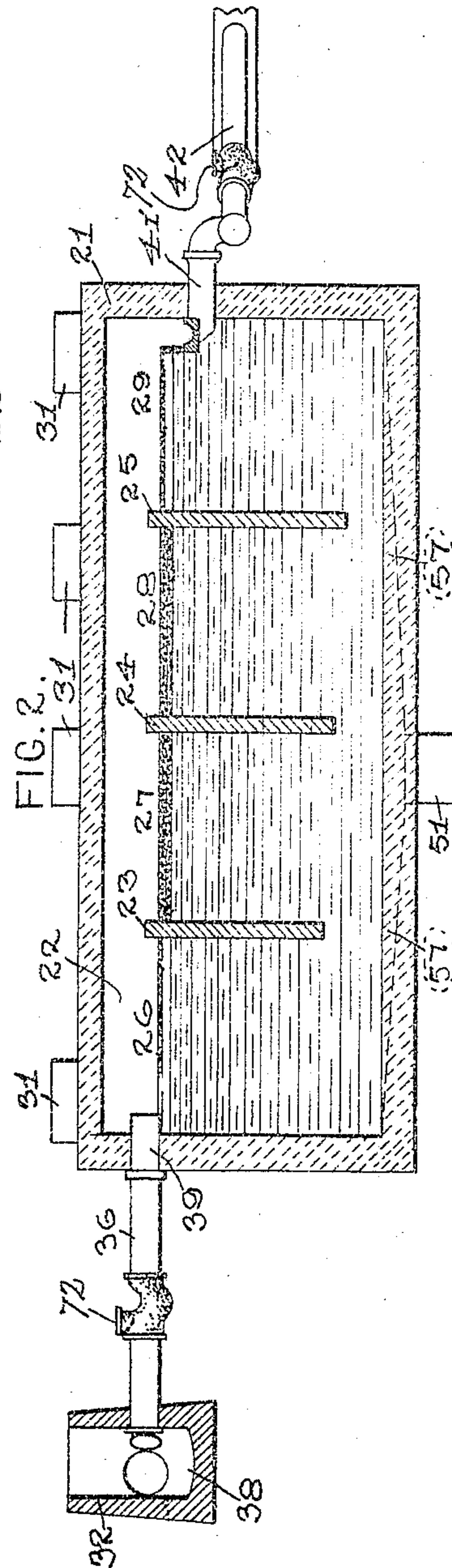
SEPTIC SEWER SYSTEM.

APPLICATION FILED JULY 23, 1904.

3 SHEETS—SHEET 1.



ATTEST  
H. J. Webster.  
attorney



INVENTORS.  
W. A. Reid.  
E. J. Hanley.

By Higdon, Longant & Hopkins, Attys



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3 SHEETS—SHEET 2.

FIG. 3

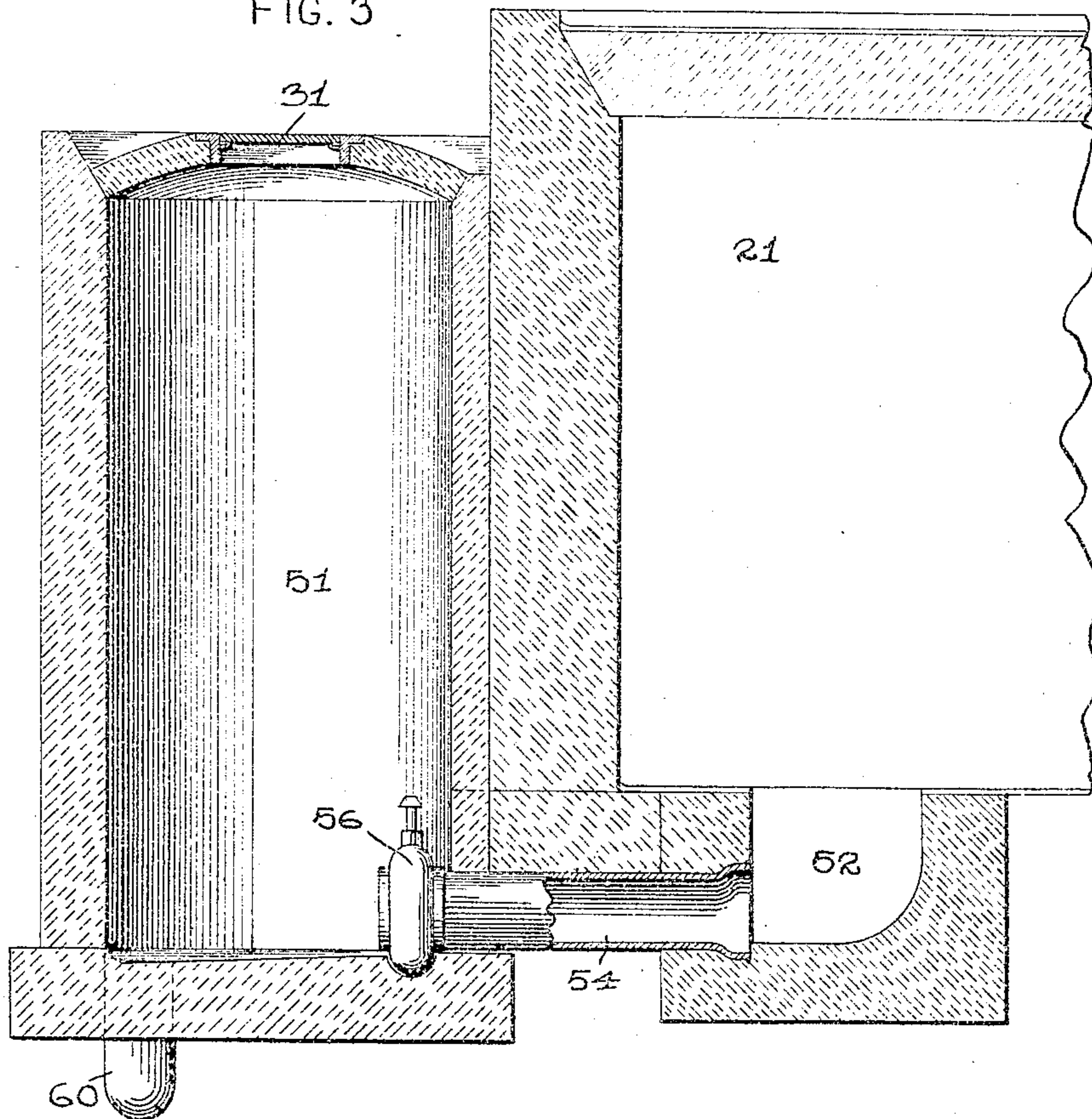
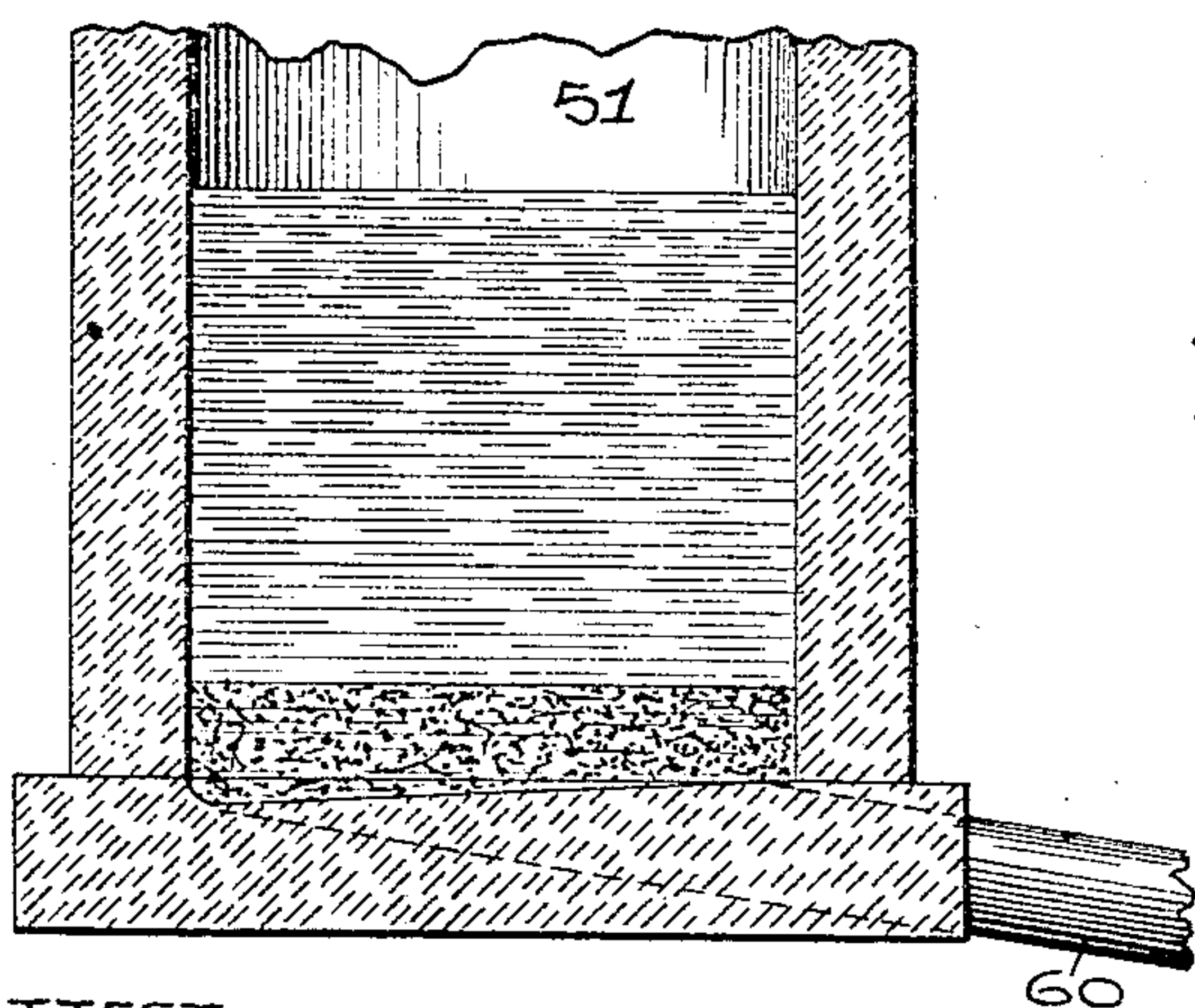


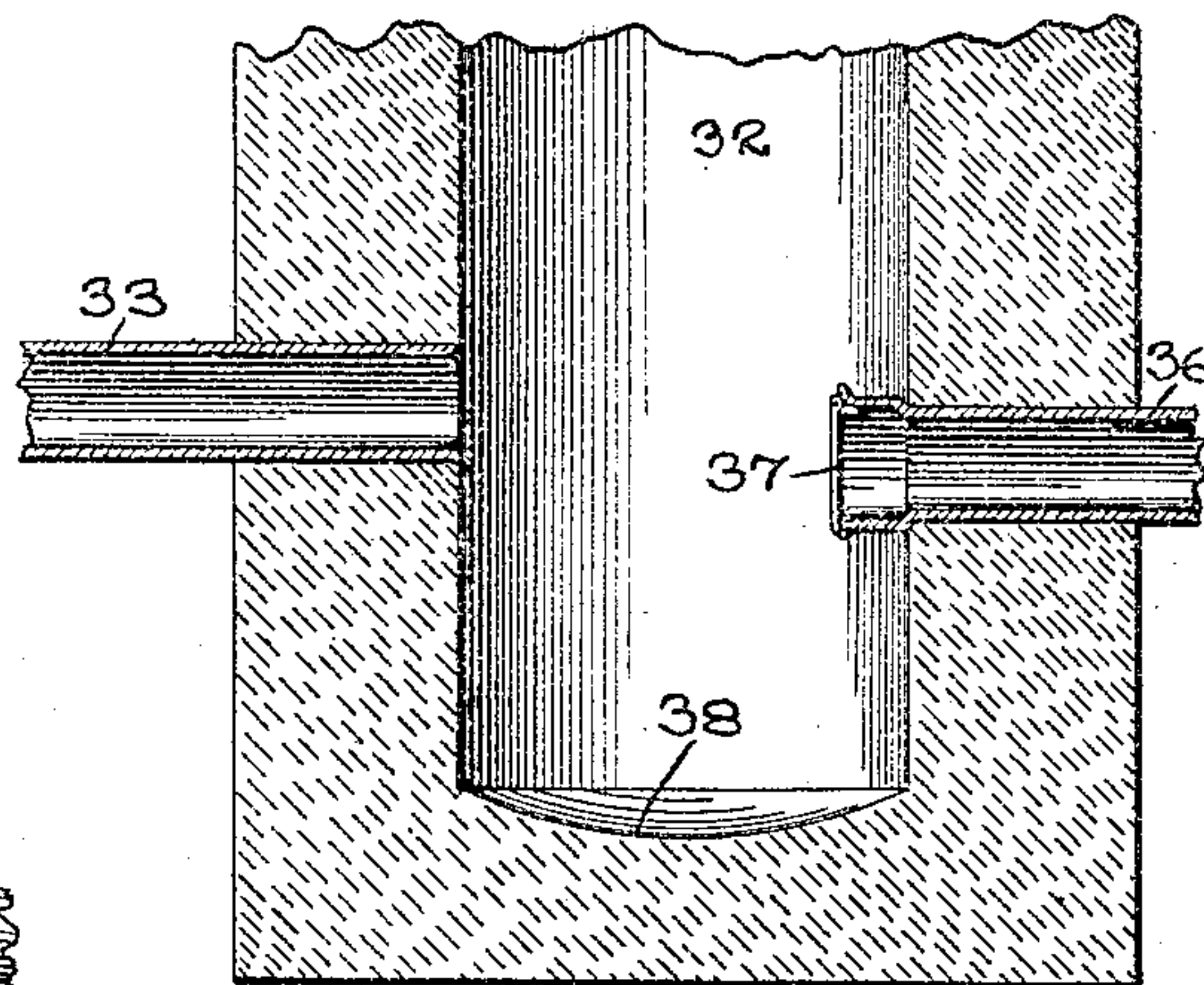
FIG. 4



ATTEST

H. G. Fletcher.  
attest

FIG. 5.



INVENTORS.

W. A. Reid.  
E. J. Hanley.

By Higdon, Longan & Hopkins, Attys.

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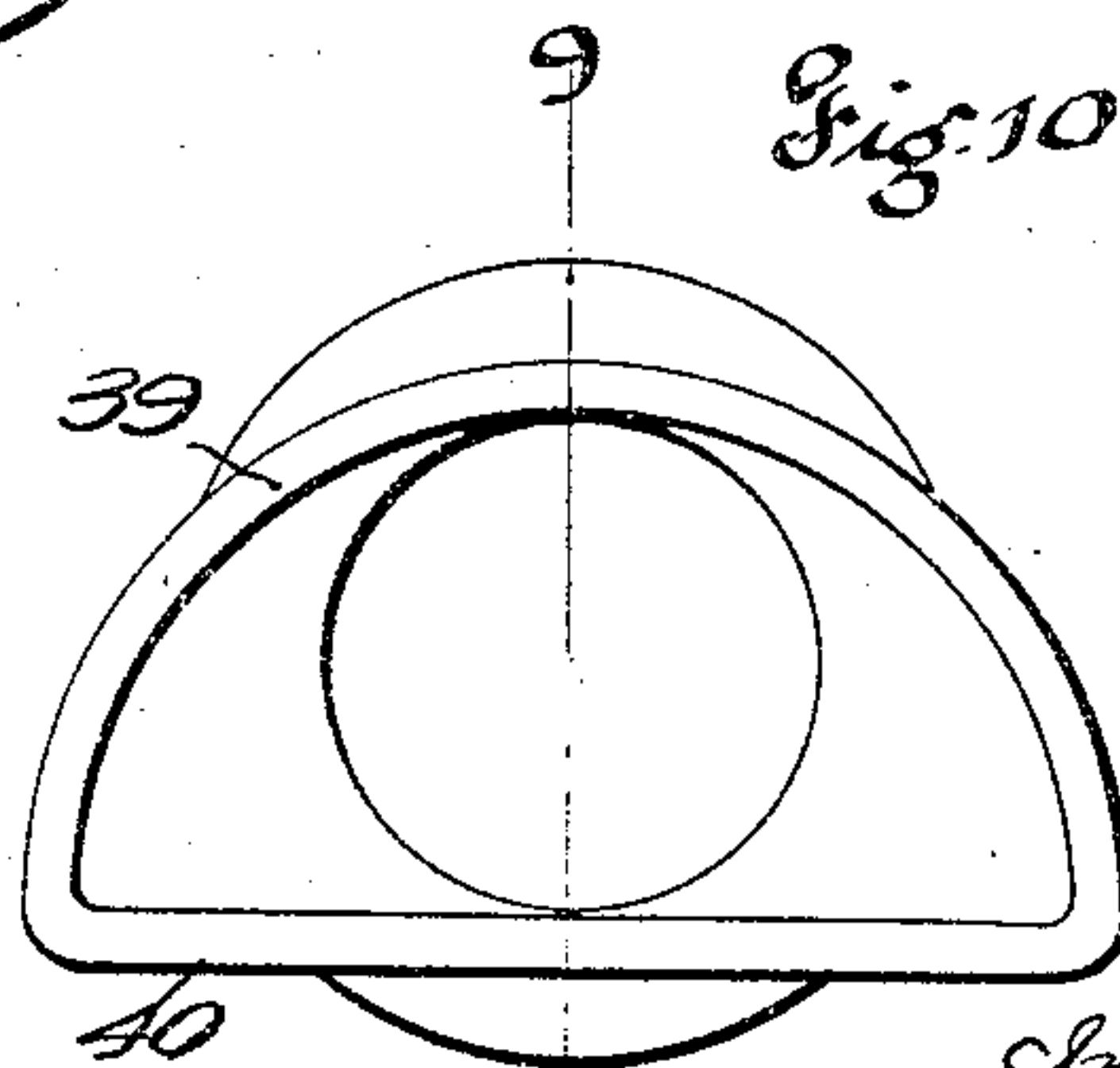
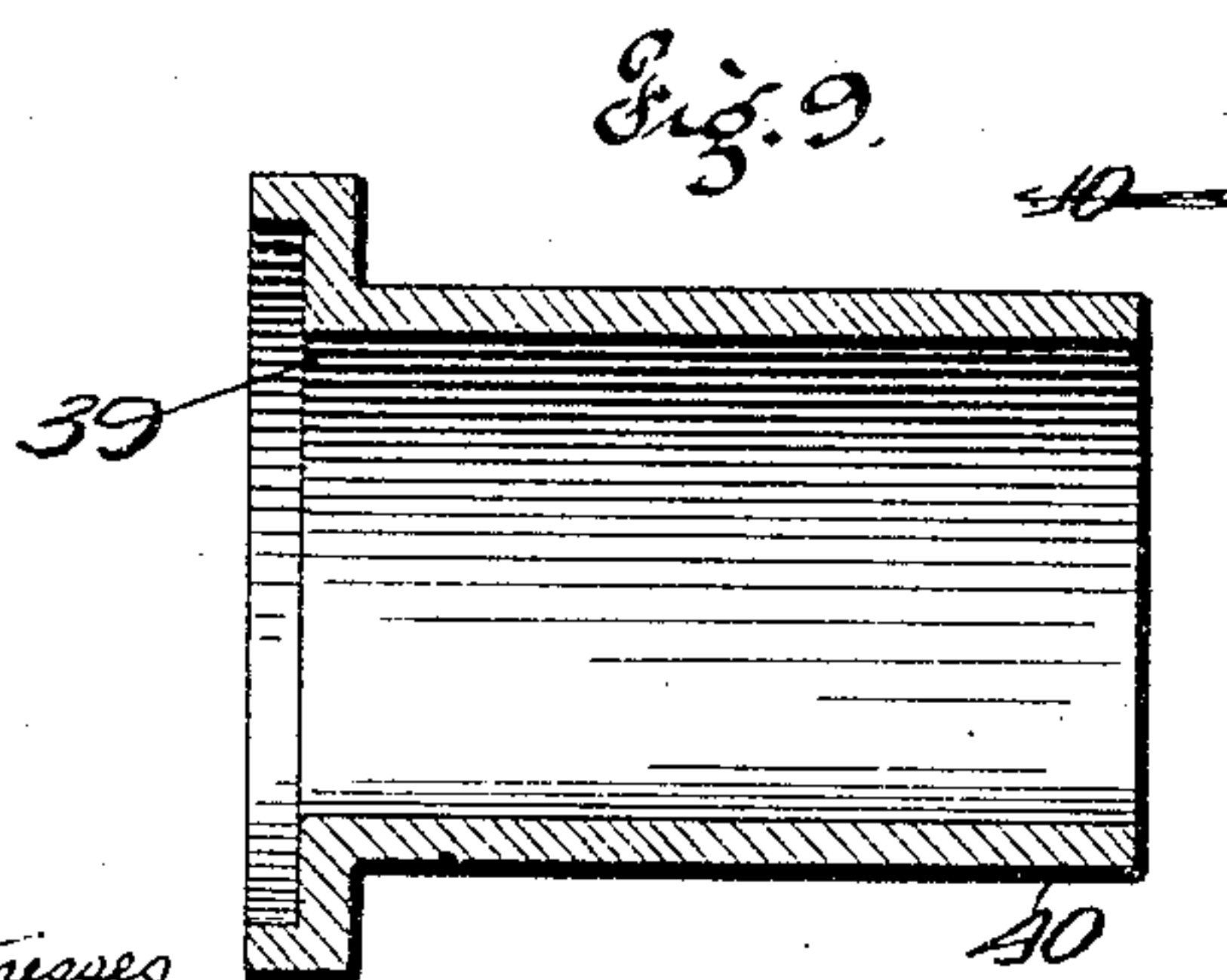
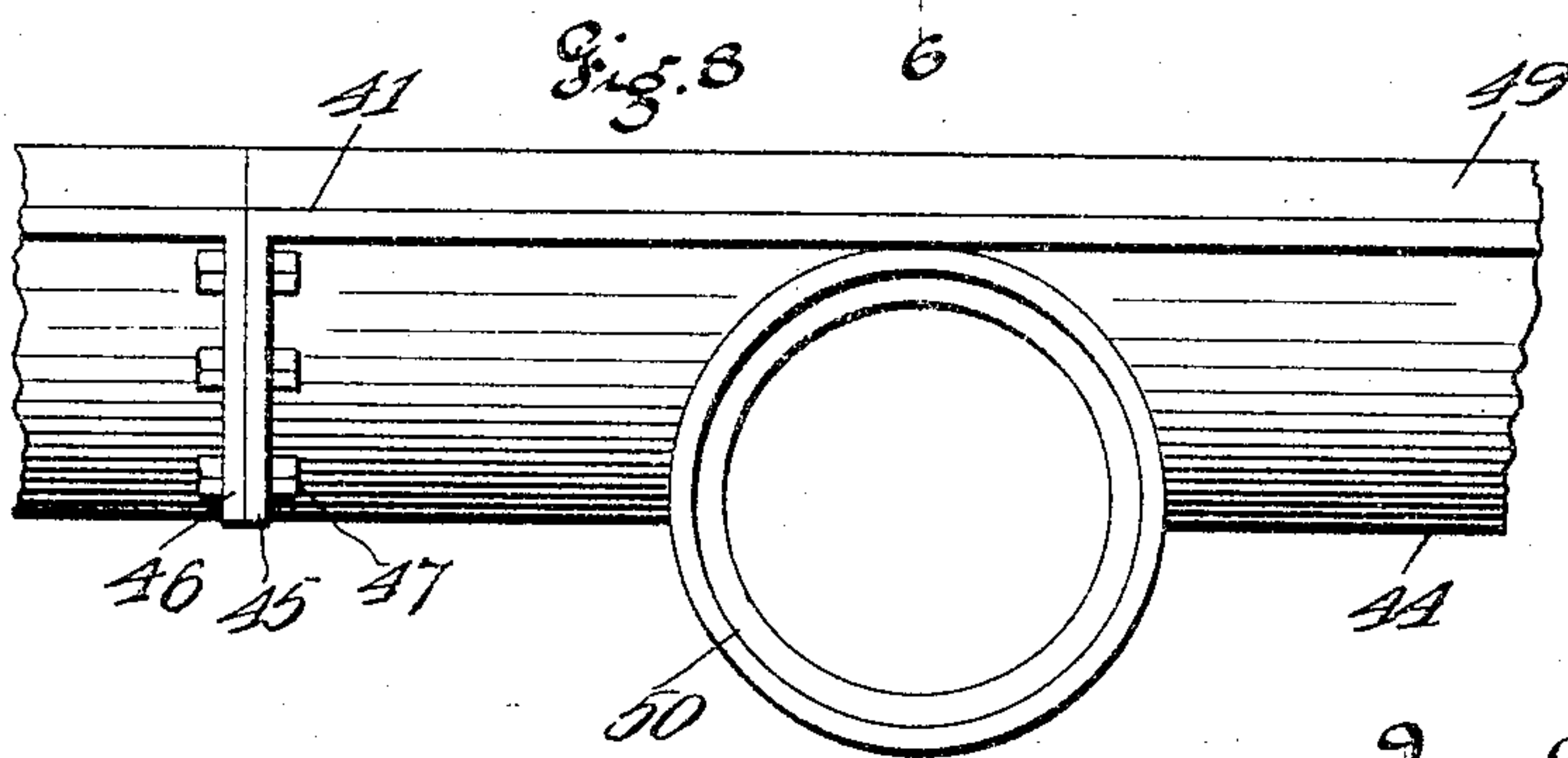
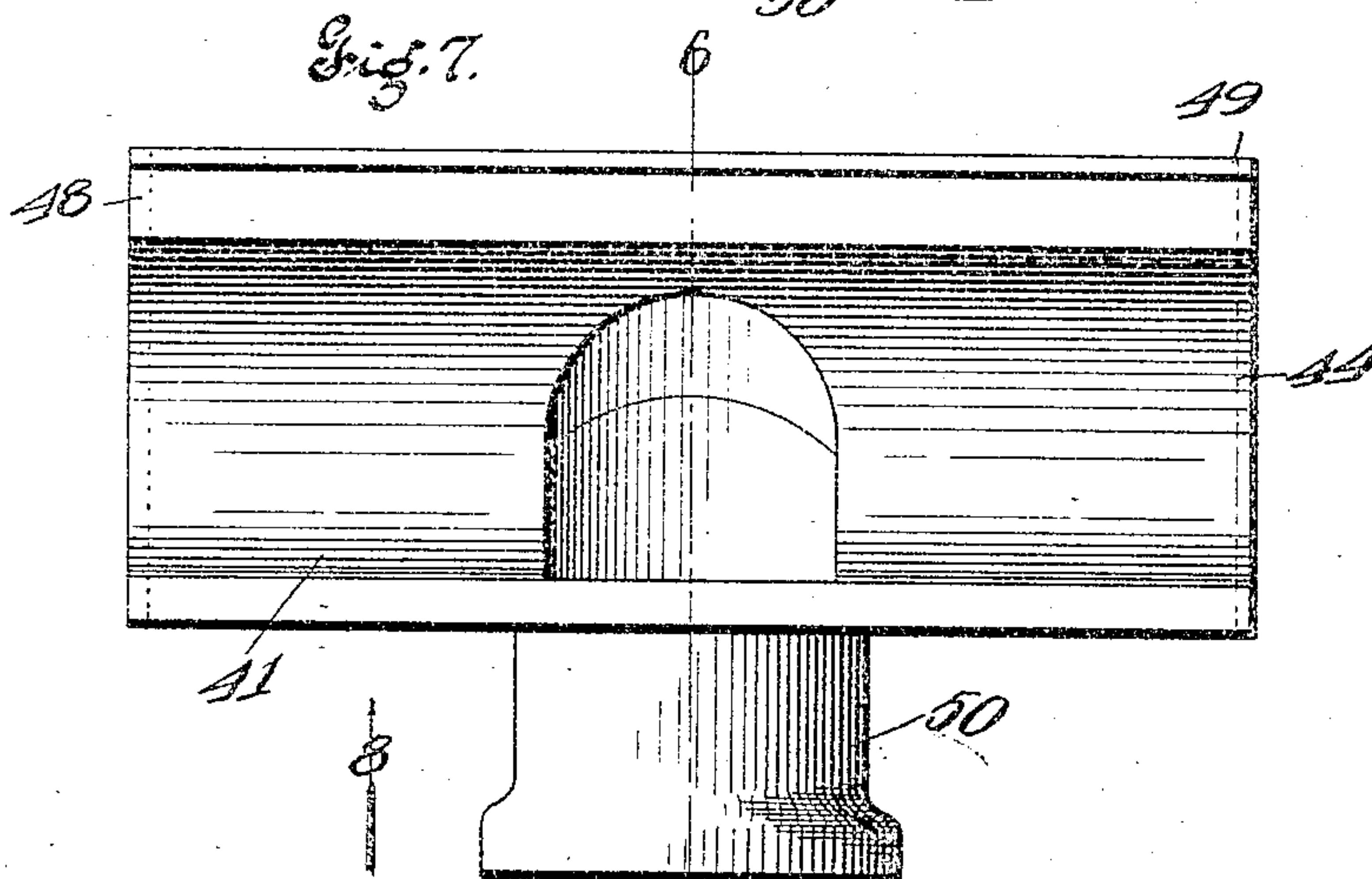
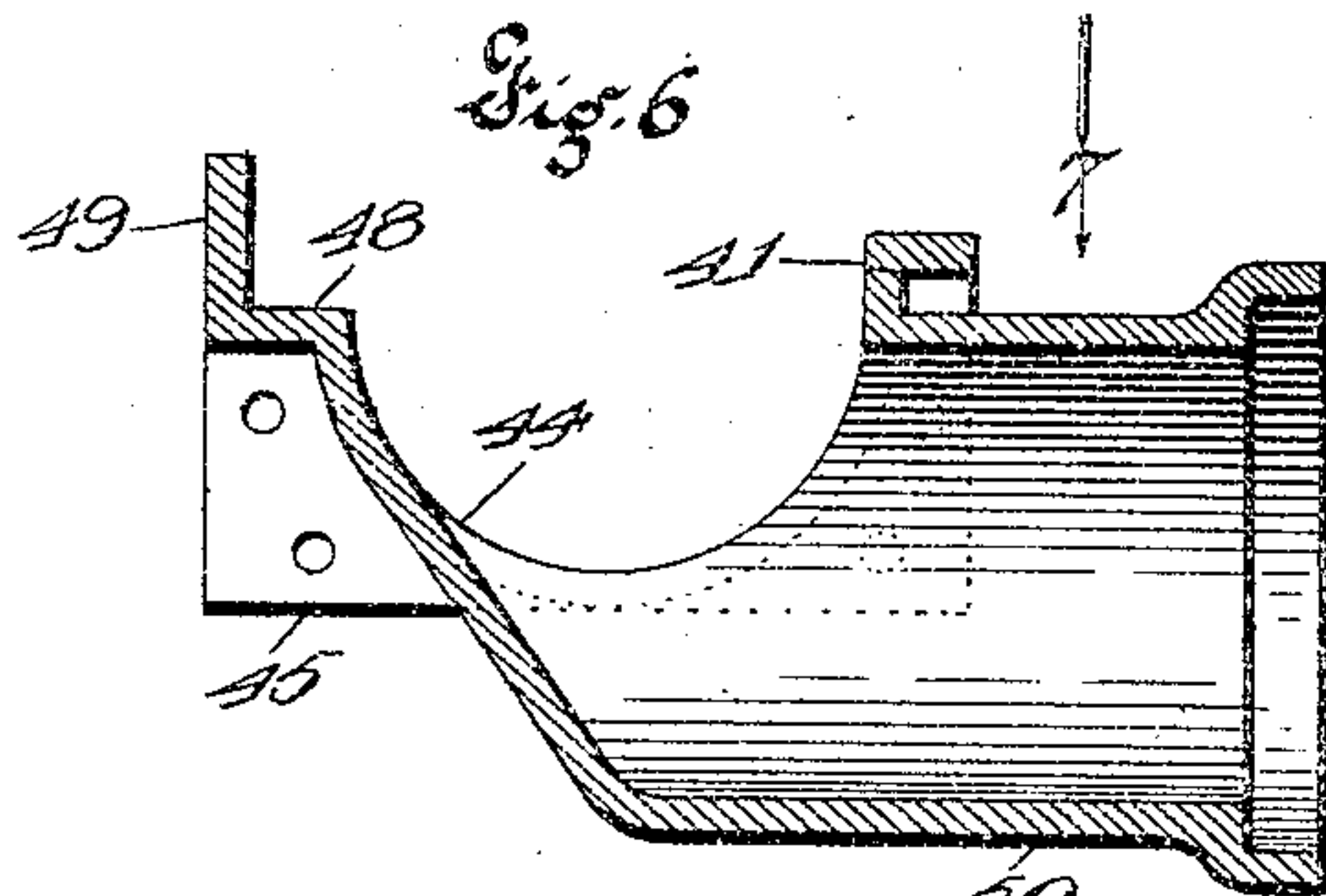
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3 SHEETS—SHEET 3.



Witnesses  
Alfred A. Davis  
Geo. W. Harrington

Inventors  
W. A. Reid  
E. J. Hanley  
by Sigdon & Longan & Hopkins Atty's



# UNITED STATES PATENT OFFICE.

WILLIAM A. REID AND EDWARD J. HANLEY, OF ST. LOUIS, MISSOURI,  
ASSIGNORS TO N. O. NELSON MANUFACTURING COMPANY, OF ST.  
LOUIS, MISSOURI.

## SEPTIC SEWER SYSTEM.

SPECIFICATION forming part of Letters Patent No. 778,506, dated December 27, 1904.

Application filed July 23, 1904. Serial No. 217,761.

*To all whom it may concern:*

Be it known that we, WILLIAM A. REID and EDWARD J. HANLEY, citizens of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Septic Sewer Systems, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to improvements in septic sewer systems; and it consists of the novel features herein shown, described, and claimed.

In the drawings, Figure 1 is a plan view in the nature of a diagram of a piece of septic sewer system embodying the principles of our invention. Fig. 2 is a sectional elevation on the line 2 2 of Fig. 1. Fig. 3 is an enlarged sectional detail on the line 3 3 of Fig. 1. Fig. 4 is an enlarged sectional detail on the line 4 4 of Fig. 1. Fig. 5 is an enlarged sectional detail on the line 5 5 of Fig. 1. Fig. 6 is a cross-section of the outlet-weir and taken on the lines 6 6 of Figs. 1 and 7. Fig. 7 is a top plan view of one section of the outlet-weir as seen looking in the direction indicated by the arrow 7 in Fig. 6. Fig. 8 is a front elevation showing the connection between two sections of the outlet-weir as seen looking in the direction indicated by the arrow 8 in Fig. 7. Fig. 9 is a sectional detail of the inlet-weir and taken on the lines 9 9 of Figs. 1 and 10. Fig. 10 is a front elevation of the inlet-weir as seen looking in the direction indicated by the arrow 10 in Fig. 9.

Referring to the drawings in detail, the pipe 20 represents the storm-sewer. The septic-sewer basin 21 is built at one side of the storm-sewer 20, and the chamber 22 of the basin is entirely inclosed, said chamber being divided crosswise by the underflow-walls 23, 24, and 25, thus forming the inlet-pool 26, the purification-pools 27 and 28, and the outlet-pool 29. The basin 21 is divided longitudinally by the wall 30, so that one-third ( $\frac{1}{3}$ ) of the basin is on one side of the wall and two-thirds ( $\frac{2}{3}$ ) of the basin on the other side of the wall. Manholes

31 provide access through the top of the basin to the chamber. The grit-chamber 32 is located near one end of the basin. A pipe 33 leads from one of the storm-sewer manholes 34 to the grit-chamber 32, and a pipe 35 leads from the grit-chamber to one part of the basin, and a similar pipe 36 leads from the grit-chamber to the other part of the basin, said pipes 35 and 36 being controlled by flap-valves 37.

The bottom 38 of the grit-chamber 32 is considerably below the inlet and outlet pipes and forms a trap to catch the grit and other solid material. The pipes 35 and 36 discharge into the basin through inlet-weirs 39, and in passing through these weirs the water falls over a flat level edge 40 in a thin sheet. The water passes out of the basin through the outlet-weirs 41, and the pipes 42 and 43 lead from the outlet-weirs back to the storm-sewer. The outlet-weirs are constructed as shown in Figs. 6, 7, and 8, and comprise a semi-circular trough 44 constructed in sections, there being flanges 45 and 46 at the ends of the sections, said flanges being secured together by bolts 47. The ends of the trough abut against the walls of the basin and are closed. A ledge 48 extends horizontally from the inner edge of the trough 44, and a flange 49 extends vertically from the inner edge of the ledge. Pipe-nipples 50 lead from the trough 44 outwardly through the wall and connect with the pipes 42 and 43. In passing outwardly from the basin the water must flow over the flange 49, fall downwardly upon the ledge 48, and then pass through the trough 44 and outwardly through the nipples 50. A sludge-well 51 is located at one side of the basin, and sludge-pockets 52 and 53 are formed in the bottom of the basin, one in each chamber. Sludge-pipes 54 and 55 lead from the sludge-pockets 52 and 53 to the sludge-well 51, said pipes being independently controlled by valves 56.

The bottoms of the chambers of the basin are constructed to lead the sludge from all parts of the chamber to the pockets 52 and 53, either by sloping the bottoms toward said pockets or by constructing grooves 57 in said



bottoms leading toward said pockets, or in any suitable manner.

A flush-pipe 58 leads from the grit-chamber 32 and discharges into the sludge-well 51, said pipe being controlled by a valve 59, and a drain-pipe 60 leads from the sludge-well to the storm-sewer. Several manholes 31 provide access to the basin 21, as before suggested, and a similar manhole provides access to the grit-chamber 32, another to the storm-sewer manhole 34, and another to the sludge-well 51.

In the operation of our septic sewer system the floods caused by storms will pass through the main or storm sewer 20, but in the dry-weather season, when there is no flood, the sewage will pass into the septic basin 21, said sewage being controlled by valves in the manhole 34 and by valves in the grit-chamber 32. If the sewage system is new and only a small amount of sewage is to be disposed of, it will be passed into the smaller part of the basin, and as the use of the sewer system increases the valves may be changed to pass the sewage into the larger part of the basin, and as the use of the sewer system still further increases both of the pipes 35 and 36 may be opened to use the entire basin. The sewage passes into the basin through the inlet-weirs 39, being discharged into the inlet-pool 26 over the flat edge 40, and by said edge is spread out into a thin sheet and falls quietly into the pool, so as to make the least possible disturbance within the basin. As soon as the impurities in the sewage begin to decompose the solid mineral matter will be precipitated upon the bottom of the basin, and by said bottom will be conducted to the sludge-pockets 52 and 53, and the vegetable matter and animal matter will rise to the top and form a bacterial mat or scum on the top of the water. In the purification-pools 27 and 28 this scum may remain indefinitely without any disturbance, and the decomposition will purify the water and the water will be discharged through the outlet-weirs back to the sewer. The water passes under the walls 23, 24, and 25, thus leaving the surface of the water undisturbed.

When it is desired to clean the sludge out of the basin, the valves 56 are opened and the weight of the water will force the sludge through the pipes 54 and 55 into the sludge-well 51. Then the valve 59 is opened and water will rush from the grit-chamber through

the pipe 58 into the sludge-well and dissolve the sludge and wash it out through the drain-pipe 60. This manner of disposing of the sludge is very simple, effective, and important.

Traps 72 are inserted into the pipes 35, 36, 42, and 43, the object of said traps being to trap the gas in the basin, thereby increasing the temperature and hastening the purification of the sewage.

We claim—

1. In a septic sewer system: a storm-sewer; a septic basin beside the storm-sewer; means of leading the dry-weather sewage from the storm-sewer to the septic basin; an outlet from the septic basin leading back to the storm-sewer; a sludge-well in connection with the septic basin; means of leading the sludge from the basin to the sludge-well; and means of flushing the sludge-well; substantially as specified.

2. In a septic sewer system: a septic basin divided into unequal parts; a storm-sewer; means of leading the sewage from the storm-sewer to either of the parts of the septic basin; an outlet from the septic basin parts; underflow-walls in the septic basin; and manholes providing access to the septic basin parts; substantially as specified.

3. In a septic sewer system: a suitable septic basin; an inlet-weir discharging into one side of the basin; a connection between the storm-sewer and the inlet-weir; an outlet-weir leading from the opposite side of the basin; a connection between the outlet-weir and the storm-sewer; and underflow-walls in said basin between the inlet-weir and the outlet-weir; substantially as specified.

4. In a septic sewer system: a storm-sewer; a suitable septic basin; an inlet-weir discharging into one side of the basin; a connection between the storm-sewer and the inlet-weir; a trap in said connection; an outlet-weir leading from the opposite side of the basin; a connection between the outlet-weir and the storm-sewer; a trap in said connection; and underflow-walls in said basin between the inlet-weir and the outlet-weir; substantially as specified.

In testimony whereof we have signed our names to this specification in presence of two subscribing witnesses.

WILLIAM A. REID.  
EDWARD J. HANLEY.

Witnesses:

ALFRED A. EICKS,  
S. G. WELLS.