

**QUESTIONS AND ANSWERS ON
THE PRACTICES AND THEORY
OF SANITARY PLUMBING VOL.1
- DRAINAGE AND VENTING**

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Questions and Answers on the Practices and Theory of Sanitary Plumbing Vol.1 - Drainage and Venting by R. M. Starbuck

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Questions and Answers

*On the
Practice and Theory
of*

SANITARY PLUMBING

VOL. I—DRAINAGE AND VENTING

Tenth Edition

By R. M. STARBUCK

Author of

- Vol. II.—“Questions and Answers on the Practice and Theory of Sanitary Plumbing—Hot Water Supply and Circulation.”
“Practical Wrinkles for the Plumber.”
“Questions and Answers on the Practice and Theory of Steam and Hot Water Heating.”
“Modern Plumbing Illustrated.”
“Standard Practical Plumbing.”
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“The Starbuck Plumber’s Estimate Book.”
“The Starbuck Examination Charts.”
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PREFACE.

In presenting to the plumbing fraternity successive editions of "Questions and Answers", the author has endeavored to keep pace with the advancement that is constantly being made, and to make each edition of greater value to his readers than the preceding one has been. The original purpose to present the subject in as concise, brief and practical a manner as possible, is still followed.

In the ninth edition, the book was revised from beginning to end, much was rejected or rewritten, and much that pertains to the most modern features of the trade added.

It was thought best to withdraw from the book everything pertaining to hot and cold water supply, and all of this has been incorporated in a companion book, entitled: *Vol. II, "Questions and Answers on the Practice and Theory of Sanitary Plumbing—Hot Water Supply and Circulation."* The companion book has 75 full-page illustrations showing an immense variety of range boiler connections, and also includes a long list of examination questions on hot and cold water supply, which it is believed will add much value to the work, inasmuch as most plumbers' examinations now include many questions on this branch of the work of the plumber.

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TRAPS.

What is a trap?

It is a vessel containing a body of water, placed in the waste pipe of a plumbing fixture and on certain drains, its purpose being to allow a free passage of waste, while at the same time preventing the passage of sewer gases and foul odors from the drainage system, sewer or cesspool, into the house.

What is the use of the trap under each fixture?

To prevent the entrance through the fixtures of gases and odors that form between the fixtures and main trap, or, if there is no main trap, to prevent such entrance directly from the sewer or cesspool.

Why should each fixture be separately trapped?

When separately trapped, each fixture is entirely independent of other fixtures, and a stoppage or other trouble at one fixture does not affect the use of other fixtures.

What is meant by the seal of a trap?

The seal of a trap is the water between the outlet of the trap and the dip.

What is ordinarily a safe depth of seal?

From 1 to 2 inches.

What depth of seal do traps generally have?

The depth of seal of $1\frac{1}{4}$ and $1\frac{1}{2}$ in. S traps is generally from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches; of 4 inch iron running traps 2 to $2\frac{1}{2}$ in., of 4 in. and 5 in. round lead traps $3\frac{1}{4}$ to 4 in.

Name the several forms of S traps.

The full S trap, the three-quarter S, the half-S, and the running trap.

What are the proper sizes of traps for the several fixtures?

Water closet 3 to 4 in., slop sink 3 in., kitchen sink $1\frac{1}{2}$ or 2 in., laundry tubs $1\frac{1}{2}$ in., bath tub $1\frac{1}{2}$ in., urinal $1\frac{1}{2}$ in., lavatory $1\frac{1}{4}$ in.

What qualities should a trap possess?

It should have a safe water seal, be non-siphonable, self-scouring, have no internal partitions, depend on no mechanical devices to form its seal, have as few corners or places where filth may collect as possible, contain sufficient water to make it practically proof against evaporation, offer the least possible resistance to flow of water, and be provided with an accessible cleanout, preferably placed below the seal.

Why are traps with internal partitions dangerous?

A flaw may exist in this partition above the water line, through which gas may enter the house.

Why should the use of traps having mechanical seals be prohibited?

The mechanical parts present an obstruction to the free passage of waste, and give opportunity for the collection of grease and foreign matter in the trap and about the mechanical parts, soon causing the latter to make an imperfect seal.

In what ways may trap seals be broken?

By siphonage, evaporation, capillary attraction, back pressure, momentum, and by gusts of wind.

How are trap seals broken by capillary attraction?

Threads, string, pieces of cloth, etc., often reach over from the seal into the outlet, and by soaking up the water in the trap may carry it over into the outlet drop by drop.

How are trap seals broken by momentum?

When a trap is placed a considerable distance below the fixture, the passage of the waste into the trap may acquire sufficient momentum to carry off with it a sufficient amount of the seal to break it.

How may gusts of wind break the seal of a trap?

Wind passing over the end of a stack, will sometimes cause sufficient commotion to the contents of a trap connected with the stack, to make a part of the seal slop over into the outlet. A loss of a few drops at a time may result finally in breaking the seal.

How are trap seals broken by back pressure?

When the sewer is not properly vented, under certain conditions pressure may be generated of sufficient amount to force the trap seal.

Is it the amount of water in the trap or the depth of seal that offers the most resistance to siphonage?

It is the amount of water.

Is it the amount of water in the trap or the depth of seal that offers the most resistance to the entrance of sewer gas?

The depth of seal offers the greatest resistance.

What is the effect of the pressure of sewer gas on the trap seal?

It saturates the water in the trap with sewer gas, which is finally thrown off into the room.

What are the two principal types of traps on which all other traps are based?

The S trap and the drum trap.

What are the comparative advantages of the S and-drum traps?

The S trap being self-scouring, is cleaner than the drum trap, but when unvented, the drum trap is much less liable to siphonage. The drum trap may often be used to better advantage under the floor than the S trap.

What are the relative advantages of different connections for drum traps?

In the illustration on page 8 we show nine different methods for this work. No. 6 represents probably the most common method. The chief objection to this method is the fact that if the gasket does not make tight, direct communication will exist. This will be the case also when the trap screw is taken out for cleaning. The chief advantage of No. 7 is that protection against the entrance of sewer gas is guaranteed even when the trap screw is removed. An objection, however, is that the outlet from the trap is liable to fill up. No. 8 overcomes the objectionable features of Nos. 6 and 7, but the pipe dipping down into the seal is an objection, as it presents additional opportunity for the collection of grease, etc. The objection to a vent through the cleanout cover, as shown in No. 9, is that whenever the trap is cleaned the vent pipe must be twisted back, and furthermore air is brought in directly upon the seal, thereby increasing evaporation. The vent opening is very liable to fill up also.

The method of Fig. 10 is a poor one for the reason that in the event of the stoppage of the vent the trap