CHAPTER V

SANITARY WORK AND APPLIANCES

The various appliances connected with the drainage of houses and premises have now to be considered.

In forming an opinion regarding the efficiency of any appliance, experience is the only safe guide, but one thing is certain, that no mechanism is satisfactory which does not comply with the principles of cleanliness and simplicity.

In conducting an examination into the sanitary condition of premises, a familiarity with the errors that are likely to be met with is hardly less important than a knowledge of what is right and proper, and it is essential that the enquiry should be conducted systematically, step by step, nothing being taken for granted; otherwise, sooner or later, a mistake will be made.

TRAPS

As traps are met with in connection with most appliances, it is convenient that they should be discussed first. The purpose served by traps is to provide a barrier against the passage of sewer or drain air from one part of the drainage system to another, or from the drainage system to the outside or house air. The barrier is a water barrier formed by a double bend in the pipe carrying the drainage. The trap is set so that the main convexity of the trap projects downwards at right angles to the earth’s surface and when it is filled with water a seal is formed separating the air on the one side from that on the other. The depth of this seal determines the extent of the barrier and it is measured as the vertical distance between the surface of the water in the trap and the lowest interior point of the bend on the upper side of the pipe forming the trap (see Fig. 30). An efficient trap must of necessity have a sufficient seal—at least 1½ inches, in larger pipes up to 3 inches, on the other hand the seal must not be too big as it will then form too much of an obstruction retarding the flow and to some extent preventing the trap from being self-cleansing. A trap must be set correctly so as to maintain the seal and, to enable this to be done easily if it is to be laid in the ground, it should be provided with a foot. There should be sufficient water retained in the trap so that it will not be unsealed by evaporation.
As all traps tend to obstruct the flow of water and are not completely self-cleansing, they should be provided with a means of access for cleansing purposes. No traps should be introduced into a drainage system unless absolutely necessary. In addition to the causes already mentioned, traps may become unsealed through the syphongage of the water in the trap from the rush of water through a nearby drain pipe with which the trap directly communicates or by the momentum of the water rushing through the trap itself, or by the compression of air or gases in the pipes. The prevention of syphongage is dealt with later (page 86). The emptying by the momentum of the rush will not occur if, wherever this is likely, the trap employed is so constructed as to retard to a greater degree the flow through it (see Fig. 31.) The emptying by air compression is prevented by proper trap ventilation. The inspector will meet with many types of traps in practice, some will be found to be good, some bad, and some useless, and for his guidance certain types will now be discussed.

Fig. 28. Faulty Syphon Traps.

Fig. 29.

Syphon Traps

The simplest form of syphon-trap for use in the course of a drain is an ordinary pipe with a bend in it (Figs. 28, 29); both those represented in the drawings, however, are faulty for various reasons. The first because (1) the dip is not sufficient to provide a proper water-seal; (2) the bottom of the trap is rounded, consequently there is a risk of its being fixed out of the level; (3) there is no provision for the ventilation of the drain, in the shape of an inlet opening on the house-side of the water-seal; and (4) no means of access to admit of the trap or the drain beyond being cleared out, should either become obstructed, are provided.

The second is open to the same objections as far as the first and second points are concerned, and as regards the third and fourth, although means of access are provided, it is not at a point that will allow of ventilation, or the unstopping of the drain beyond. Still another objection is that floating matter is likely to accumulate in the central shaft.

A trap which complies with all these requirements is shown in Fig. 30. It has two openings in addition to the inlet and outlet, one
which is carried by means of pipes to the ground surface and covered by an open grating to act as an air inlet and the other beyond the seal which can be used for cleansing the drain between the trap and the sewer or cesspool. It will be noticed that this trap has a deeper seal; that the drain inlet is well above the outlet, affording a better flush; and that it stands on a flat bottom, which facilitates it being laid level.

**Raking-arm** :- In the event of the drain terminating in a manhole, such as has been described on page 63, previous to joining the sewer or cesspool, and it is the intention to disconnect the drain, a special form of disconnecting trap, represented in the sketch (Fig. 31), with a raking-arm or by-pass to allow of the drain being cleared beyond the trap, should be used. In this case an inlet for ventilation may be provided by means of openings in the manhole cover, or if, by reason of its position, there is an objection to this, by a special opening at the side, which is carried up some distance above the ground level.

Figs. 31 and 32 represent improved traps, the syphons of which are egg-shaped in section and curtailed in calibre; also in Fig. 32 the raking-arm has a second inlet which is sealed by a movable plug with chain attached. This trap is more likely to be self-cleansing, but should it become obstructed, as may sometimes happen, the sewage which in consequence would collect in the manhole would be liberated by pulling the chain; without this contrivance it would be necessary to empty the manhole by means of a pump or with buckets before any one could enter it to unstop the trap.
_Intercepting ventilating traps:_ Reference may here be made to the need for intercepting ventilating traps such as those shown in Figs. 30 and 31. Such traps were invariably placed in the house drain as it left the house site to join the sewer, that is, the lowest point of the house drainage system. The left hand side of the trap shown in the figure was on the house side, and the ventilating arm formed an inlet for fresh air entering the house drains here and possibly passing up the drains to escape ultimately by ventilators at the highest point of the drainage system. Sewage being warmer than the temperature outside, drain air becomes warmer than outside air, and the warm air tends to rise to the highest point and fresh air is sucked in at the ventilating arm of the trap. Such was the theoretical course of the air in the drains, and providing that no disturbing element arose (such as winds, changes in temperature, etc.) the air would move along these lines. An enquiry by a committee of the Local Government Board more than 30 years ago, threw doubt on the usefulness of this trap in many instances, and though the recommendations of this committee have not been generally adopted, it may be taken that in the case of a new and otherwise satisfactory drainage and sewerage system, the trap is unnecessary and may be omitted, but in all other cases they should be insisted upon.

One not infrequently finds that a trap similar to that just described (Fig. 30) is placed at the point where the soil-pipe joins the drain, notwithstanding the fact that another and similar trap is placed at the terminal end of the drain. In these circumstances, the soil-pipe cannot answer the purpose of a ventilator for the drain; consequently a trap should not be placed at the bottom of a soil-pipe.

Syphon traps are sometimes spoken of as S-traps or P-traps, according as the outlet bends down to complete the S or takes a more horizontal course to form a kind of P.

_Cully-Traps_

For the purpose of cutting off the various waste pipes of the house (bathroom, sink, etc.), and the rain-pipes, from direct connection with the drain, gully-traps are used. They are placed in yards, for the purpose of receiving the rainfall, and the water used for swilling purposes, carriage washing, etc. In fact, whenever it is necessary to
make a connection with a drain, apart from the soil-pipe connection, some form of gully-trap must be employed.

In the case of yard gullies, evaporation during warm weather is apt to lower the water-seal, and so render the trap inefficient. For this reason it is essential, at such times, to replenish the traps periodically with water.

Gully-traps must invariably be placed outside the house; in no circumstances whatever is it justifiable to fix one within the house—in the cellar, for example—although one frequently finds that this is done. Indeed it is by no means uncommon to find one of these, or even a bad form of trap, fixed in a back-kitchen, larder, or dairy, and connected with the drain simply as a convenience for floor washing.

![Fig. 33.—Simple Gully-Trap.](image1)

![Fig. 34.—Gully-Trap Complying with the Model Bye-Laws.](image2)

The ordinary form of gully-trap (Fig. 33) is very simple and inexpensive, and it answers the purpose well, so far as the yard drainage and rain-pipe discharge are concerned. It is essential that it should be periodically cleaned out, but this applies to all alike. The grating, which may be of iron or stoneware, although the former is preferable, is surrounded by a cup-shaped arrangement of stoneware.

Street gullies, which of course are large, are similarly constructed, with the exception that the iron gratings are fixed by means of brickwork set in cement. Gullies are made with side inlets below the gratings, for the connections of waste-pipes; this arrangement, although unobjectionable, is not quite in accordance with the model bye-laws, which require that waste-pipes shall discharge on to an open channel leading to the trap.

The accompanying sketch (Fig. 34) represents an arrangement which is in compliance with the bye-law in question. It will be
noticed that this gully is fitted with a bucket, which can be lifted out by means of a handle, so that grease and sediment in the trap can be frequently and easily removed. It is important that this bucket should be provided with a flange round the top, fitting accurately to the sides of the trap, so as to prevent any dirt falling over the sides when it is being removed.

In connecting a sink placed in the basement storey of a house, which has no area outside the external wall, a convenient plan is to lay pipes from the surface vertically down to the gully, which of course is necessarily a long way below the surface, and to extend the handle of the bucket so that it may be reached from the grating, which is fixed at the ground level. This is not strictly in accordance with the above bye-law, because the waste-pipe must, of necessity, discharge directly on to the gully, but no other arrangement in the circumstances is possible, and as all the pipes ought to be trapped within the house, in addition to the outside disconnection, there can be little objection to the proceeding.

Grease Traps

Various contrivances are made for the purpose of guarding against the trouble arising from grease being discharged into drains, and thus causing obstruction. The grease trap shown in Fig. 35 is a good type. The sink water is cooled on coming in contact with the considerable volume of cold water in the trap, the fat is thus solidified, and, being lighter than water it rises to the top, the heavier matters, on the other hand, falling to the bottom. Connected with the inlet, A, is the discharge pipe from an automatic flush tank (see p. 72), which is constantly filling with water, the supply being regulated according to the frequency with which it is considered desirable the flush should take place. Of course the fixing of this appliance is only practicable in the case of large establishments. The effect of this arrangement is twofold; any sediment that may have formed is at once carried away, and the solidified grease, which has collected on the surface, is broken up, and, being solid, it is carried on by the flush of water in place of adhering to the pipes.
Other Traps

The bell-trap (Fig. 36) must be condemned whenever it is met with. Until comparatively recently this form of trap was almost invariably fixed within houses, and very often outside also, although the dipstone trap was the favourite one for outside use.

The chief objections to the bell-trap are the following:—(1) The shallowness of the water-seal, which is no deeper than about $\frac{3}{4}$ of an inch, and in most instances even less. (2) The tendency to its becoming choked with grease, owing to the smallness of the space between the bell and the waste-pipe. (3) The fact that when the grating is removed (as it often must be, to clear away obstructions), the waste-pipe is untrapped. (4) The fact that the bell is frequently broken off, in which case it no longer constitutes a trap. It is astonishing how often the latter objection is found to apply, and it is by no means uncommon to find that the bell, when it is present, is not deep enough to reach the water in the trap.

Antill's trap, Fig. 37, is little better than the bell-trap; the mason's or dipstone trap, Fig. 38, is a bad trap, being simply a small cesspool, while the D-trap, Fig. 39, is another trap to be condemned. On the other hand, the trap shown in Fig. 40, sometimes called the anti-D-trap, which is really a syphon trap, is an excellent one,
To summarise the requirements of a good trap, we may say that
(1) it should have a sufficient water seal; (2) it should be self-
cleansing; (3) it should not present too great an obstruction to
water flowing through it; (4) it should not contain too much water;
(5) it should be easy to lay evenly—so that it is properly sealed;
(6) a means of access to it should be provided; (7) it should not be
liable to unsealing by syphonic (sucking) action, by inequalities of
pressure of gases (e.g. through accumulation of foul gases); (8) it
should not be laid inside a house or food premises; and where
traps are liable to be unsealed by evaporation, provision should
be made for renewing the water. It has been said that sewer
gas may pass through a trap by absorption on one side and
emission on the other. This is theoretically possible, but very
infrequent. Some other cause usually exists for a complaint of
this kind.

AUTOMATIC FLUSH-TANKS

Drains and sewers may be regularly flushed, a proceeding which
in all circumstances is desirable and often essential, by means of
the excellent contrivances known as automatic flush-tanks.

Drains and sewers ought to be laid with a sufficient fall to be self-
cleansing under the conditions of an ordinary flow of sewage, but
this is not always possible, in which case the flow must be periodically
supplemented by some other means.

Field’s flush-tank, shown in section (Fig. 41), has been designed for
this purpose, and answers admirably. It may be constructed to hold
any quantity of water, in accordance with the size of the drain or
sewer which it is intended to flush, the diameter of the outlet being
regulated accordingly. Tanks of this description which are connected
with large sewers are mostly built in brickwork, but those for drains
and smaller sewers are usually made of galvanised wrought iron.
In the case of private drains, the usual capacity of such a tank is
from 80 to 100 gallons, the diameter of the discharge pipe being
4 inches. The automatic discharge is accomplished by means of
the syphon arrangement in the interior. Passing through the floor
of the tank is a pipe which is open at both ends; the lower end
terminates in a chamber underneath, containing water into which
it dips, and in the interior it is surrounded by a cap which does not
reach quite to the bottom of the tank. This constitutes the syphon.
A tap is connected with the tank, and the flow of water is regulated
in accordance with the length of interval it is intended should elapse
between each discharge. The syphon action is started in the following
manner:—As the tank fills, the water ascends between the inner and
the outer pipes, displacing the air down the central pipe, through
the water in the lower chamber. When the water has risen to the
top of the central pipe, it begins to fall down into the lower chamber,
carrying with it a certain quantity of air; in time, by this process,
a sufficient vacuum is established within the pipe to cause the pressure
of the atmosphere to force the water from the tank into it, and thus,
syphon-action being started, the tank is rapidly emptied through the
outlet from the lower chamber which is connected with the drain.
In order to encourage the formation of the vacuum, the top rim of
the central pipe is curved inwards, so that the water, in place of
trickling down the sides, falls freely down the centre. For this reason,
it is important in fixing the tank to notice that the syphon is perfectly
upright.

The other illustration (Fig. 42) shows Adam’s flushing gully, which
is used for drain flushing.

All flushing tanks and gullies should be so constructed or used
that they do not syphon off any trap connected with them, forming
a barrier between the drain or sewer and the outside air.

**WATER CLOSETS**

A water closet should comply with the following points:

(1) It ought to be placed next an outside wall, and, if possible,
separated from the house by a passage with cross-window ventilation,
the closet itself being provided with a window for ventilation.

(2) A separate clean water flush by mechanical or automatic
action must be provided. This must not be taken from any cistern
for supplying drinking water, or service water-pipe, and should be
sufficient to remove the excreta entirely, and nothing in the con-
struction of the closet should tend to interfere with this complete
removal.

(3) The water flushing the basin should be delivered at several
points under the rim of the basin (flushing rim), spreading therefrom
over the whole surface of the basin.
(4) The soil-pipe should be outside the house,* a water-seal being interposed between it and the closet, and it ought to be so constructed as to allow of the free passage of air though it.

The following varieties of water closets are met with:—The valve; the wash-down; the syphonic; the wash-out; the plug; the pan; and long and short hopper.

The Valve Closet

The valve closet (Fig. 43) is an excellent appliance provided economy is not considered. It was much in use at one time but is now only infrequently seen. There is a certain amount of mechanism in its construction and unless the best quality of workmanship has been obtained faults soon become apparent, so that the simplest wash-down closet, if well designed (as described later), is much to be preferred to a cheap valve closet. In the illustration it will be seen that the apparatus consists of an enamelled earthenware basin, A, which is kept about two-thirds full of water by means of a valve, B, at the outlet. The water flush is connected with the rim of the basin, which is turned inwards upon itself, C, so that the discharge passes all over the surface, in place of being distributed over one side only, as is the case with the fan spreader. By means of a "pull" the valve is depressed within box D, which is connected with the basin above, and with the soil-pipe trap below, and thus the water and the contents of the basin are discharged through an opening 3 inches in diameter into the soil-pipe. The valve-box, which ought to be made of cast-iron, enamelled on the inside, is connected with the trap by means of a short conducting pipe, E. A lead overflow pipe, F, with a properly constructed syphon-trap connects the basin with the valve-box below. Valve closets without overflows were fixed not infrequently; in such a case, in the event of accident the basin overflows into the safe-tray.

It is also important to ventilate the valve-box by a pipe, H, which should be carried through the wall at a convenient point a few feet away from a window, where it should be cut short and left open to the air. It is not necessary to continue this air-pipe upwards above the roof, the closet being self-cleansing, and the soil-pipe being

* This requirement is modified in the one-pipe system (see page 90),
ventilated. With a valve-box not so ventilated, the syphon-trap of
the closet overflow is liable to be unsealed by the rush of water through
the conducting pipe, E, when the closet is used, particularly if the
pan has been filled up to the brim. Any foul air that may be generated
in the closet-trap, if the handle of the water-closet should be carelessly
pulled so as not to allow of the free flush of the trap, readily escapes
by this pipe.

It is convenient to connect the overflow pipe with the valve-box
ventilator, and there is no objection to such a proceeding.

Upon the floor under the closet, a safe or tray should be fixed to
prevent injury to the floor, or the ceiling below (if the water-closet
is on an upper floor), in the event of the overflow of the basin (if
it has one) becoming stopped, and the supply valve becoming defective,
or any other accidental circumstance that might cause leakage.
The construction of this safe, and the arrangement of its overflow,
will be described in the next chapter.

The Wash-down Closet

When properly constructed
the wash-down closet is good and
is now the type most commonly
found. Fig. 44 illustrates this
type. It is made in one piece of
stoneware, and in some of modern
make a 2-gallon flush will almost
invariably, and a 3-gallon flush
will invariably, with proper use,
leave the trap free from paper or
excreta, and they are not open to the objection arising from splashing.
In fact, this design of closet, if properly constructed after the fashion
shown in the drawing, with a good depth of seal, and a sufficient
surface area of water to provide against fouling of the surface of the
basin by excreta, and fitted in accordance with the rules laid down
in the next chapter, compares favourably with any, including the
valve closet, and it has the advantage over the latter that it costs
less than one-half as much.

The Syphonic Closet

The syphonic closet is an excellent closet, although more expensive
than the wash-down. Fig. 45 shows one type of syphonic closet, the
feature of which is that the ascending arm of the syphon trap is con-
tinued upwards, so that the water in the basin stands at a higher
level, and consequently a larger area is exposed, and a deeper seal
is formed; also, the descending arm terminates in a second syphon
before it joins the soil-pipe. Syphonic action is started with the inflow of water from the supply cistern, both by the pipe A, passing to the rim, and by the pipe B, discharging into the descending arm of the syphon, and the contents of the basin are rapidly extracted by that means.

Another somewhat simpler syphonic closet is made, dependent for its syphonic action on a large volume of water suddenly discharged into the basin. The wide outlet pipe from the water closet is contracted to fit on to the soil pipe without, as in the previous case, the intervention of a trap. The sudden filling of the basin in these circumstances, starts a syphonic action, and gives a satisfactory emptying and cleansing. The type is suitable where the water closet compartment is low and a large volume of water can, without much force, be discharged quickly into the closet basin through a wide pipe from the cistern. Both the wash-down closet and the syphonic closet should be provided with a means of after-flow of water after flushing, (see A Fig. 44) so as to restore the water trap of the closet in case it becomes completely unsealed after use.

The Wash-out Closet

Fig. 46 shows the wash-out closet which is a bad type. In the first place, the interruption of the downward flush leads only to the partial emptying of the trap; and, secondly, the splashing of the water against the wall of the basin above the trap causes portions of faecal matter to be deposited on the sides in a position beyond convenient reach for cleansing. This, in time, causes the glaze to crack, and so by converting what ought to be a non-porous into a porous surface the mischief is added to. The effect of both these faults is to produce a condition of things that is hardly less objectionable than that which occurs in the case of the old pan closet. The mixture of urine and faecal matter which remains in the trap after the flush leads to a deposit being formed on the sides, which soon begins to decompose, and each time the closet is used a certain area of this
deposit is exposed, with the result that foul odours are given off. But, in addition to this, the part immediately above the trap, which is freely exposed to the air of the apartment, and which, as already stated, in time becomes coated with filth, is alternately wet and dry, and constantly gives off offensive odours.

Fig. 47.—Plug Closet.

Plug and Pan Closets
Two bad types, shown in Figs. 47 and 48 respectively, and now becoming rare, are the plug and the pan closets. They both go readily

Fig. 48.—Pan Closet.

out of order, and even when in working order are not self-cleansing and become offensive.

The Hopper Closet
There is also the hopper closet, of which the two kinds, the long and the short, are shown in Figs. 49 and 50. The long will be seen to be a bad type, while the short is much like the wash-down, differing
from it chiefly in being made in two pieces, and is, on the whole, a moderately good type.

**The Trough-Closet**

For manufactories, and, possibly, for blocks of buildings, the trough-closet (Fig. 51) is suitable; but, although many have been provided for schools, their use in such buildings cannot be recommended for two reasons—first, because the flush, being intermittent and automatic, the closet must frequently be used before the excreta and urine of the previous users have been removed; and, secondly, because it affords a bad object lesson for the children. This form of closet may be said to be a combination of wash-out closets with a common flush. It consists of a trough, usually of stoneware, which extends from one end to the other of a series of closets, which are simply compartments formed by partitions, each having an opening into the trough, and the whole being under one roof, and freely ventilated. The form shown in Fig. 51 is a great improvement on
the original trough-closet, which consisted of a trough only, no rim-flushed hoppers or basins being introduced. Connected with the rim of each basin or hopper is a pipe from an automatic flush tank, similar to that described on page 72, which is fixed about 5 feet above the closet seats. Each closet is trapped by the hoppers dipping into the water in the trough, and there is a common trap cutting off the latter from the drain. The size of the flush-tank depends upon the number of closets on the system, and the frequency of the flush is regulated by the tap on the supply-pipe.

The trough-closet system is only admissible on a large scale in towns with ample water supplies and favourably situated for dealing with the sewage. It may be essential, however, to exercise economy in the consumption of water, owing to its scarcity, or because the surroundings necessitate a pumping scheme, or because ample land is not available, in which case the introduction of the trough-closet system on a large scale may not be expedient.

**Waste Water Closets**

Closets in which the waste water from kitchen sinks and lavatory basins is used for flushing the closet, have been fairly extensively installed in certain areas. The diagram, Fig. 52, shows one of the best types.

Experience has shown that such closets are quite unsatisfactory, and whenever possible they should be replaced by fresh water closets (see pp. 211-215).
Slop Sinks

In most houses the water closet is used as a slop sink, but where special slop sinks are provided, they should be of white porcelain enamel with a flushing rim and have a separate water cistern similar to a water closet. The waste pipe is usually smaller (2 to 2½ inches) and there is greater danger of syphonage of the trap, so special care has to be taken to prevent this. To avoid the risk of soap, scouring cloths, etc., entering the waste pipe, the sink outlet should be protected with crossbars of brass.

Urinals

Urinals are very apt to create nuisance in a house unless of good construction and constantly attended to. The stall urinal of white glazed fireclay is the only kind that should be used, but regular, copious and complete flushing of the stall and of the channel and trap from the stall, is essential. A separate water cistern should be provided for this flushing, the water from which may be discharged automatically at intervals or by a pull. The floor around should be non-porous, able to be flushed and be laid at an angle to drain freely to the channel outlet, which should have a separate syphon trap and be connected to a soil-pipe, properly ventilated. The position and ventilation of the urinal requires special attention, wherever one is placed in a house.

Flush Cisterns

Special cisterns for supplying the flush for water closets and urinals must always be provided and in many towns what are termed *water waste-preventing cisterns*, which discharge only 2 gallons at a time, are insisted upon. From what has already been said, it will have been understood that this quantity is hardly sufficient even for closets of the best construction, and for any other it is far too little. Whenever possible, therefore, it is advisable to fix a cistern which delivers 3 gallons.

The drawing (Fig. 53) represents one of the many kinds of cisterns which discharge by syphon action; it is simple in design, and requires little description. The water supply is regulated by a ball-tap, and syphonage takes place when the plug is raised by pulling the handle. When once syphon action is started the whole of the water will be discharged, whether the handle is liberated or not.

These cisterns are generally made of cast-iron, and, to prevent rusting, they should be galvanised. The formation of rust is very objectionable as it causes staining of the closet basin. For this reason, cisterns are sometimes made of wood with lead lining, and these are certainly to be preferred to the cast-iron ones, although they
are a little more costly. In selecting a cistern it is important to notice whether it is silent in action, as many of them are very much the reverse, and give rise to complaints in consequence. Often, however, this is not so much the fault of the cistern as of the plumber who fixes it.

![Fig. 53.—Flush Cistern.](image)

**Supply-valve and Bellows-regulator**

A cistern of the water waste-preventer type is not suited for a valve closet, but an ordinary cistern with a ball tap should be used, the flush being regulated by what is called a supply-valve and bellows-regulator, an apparatus which is worked by means of the closet pull. In Fig. 54, A represents the bellows-regulator, which is made of copper. The small tap at the top (not shown in the figure) is for the purpose of regulating the pace at which air can pass out of the bellows, and it is this which determines the amount of water that is discharged into the basin. By turning the tap so that the air passes
through slowly, the weighted lever, C, takes longer to descend and close the supply-valve, B, and until this is closed water will continue to be delivered from the cistern. If the cistern is placed as high as 4 feet above the closet, a 2-inch pipe, connected with a 1½-inch supply-valve, will supply a sufficient flush, but if the height is only a foot or two, then a larger valve is necessary.

KITCHEN SINKS

The kitchen sink requires the attention of the inspector. In many houses in some parts of the country, this consists simply of a large flat stone, slightly hollowed, upon which the vessel containing hot water for washing dishes is placed. The slop stone may or may not be provided with a water supply, and it may or may not be provided with an outlet to the drain. When such an appliance is placed in a dark part of the house against a porous wall, nuisance soon results. Kitchen sinks should be of glazed pottery ware, but as the glaze is apt to be destroyed, one of glass, lead, or tinned copper may be permitted. Such sinks should be placed against, or close by, an outside wall and be well lighted. The wall above should be tiled or made non-porous and easily cleansed. The sinks should be trapped, protected from syphonage, and discharge over a grease trap if possible. The outlet pipe from the sink, 1½ inches in diameter, should have a grating fixed in a cup below the bottom of the sink into which a plug fits, attached to a chain. A sink ought to be provided with both a hot and cold water supply.