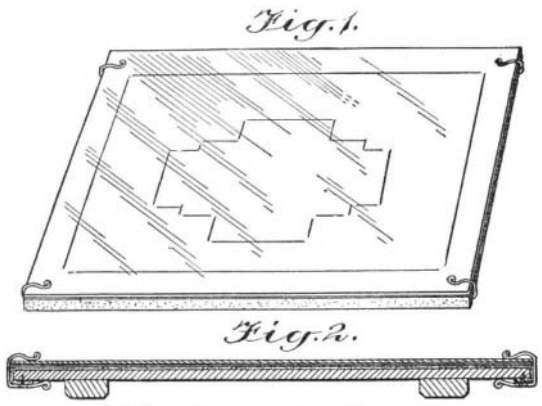
Handy Man's Workshop

SIMPLE BLUE-PRINTING FRAME.

BY C. L. SWEZEY.

For those desiring to make a few small blue prints, and having no regular printing frame, the following may prove useful.



SIMPLE BLUE-PRINTING FRAME.

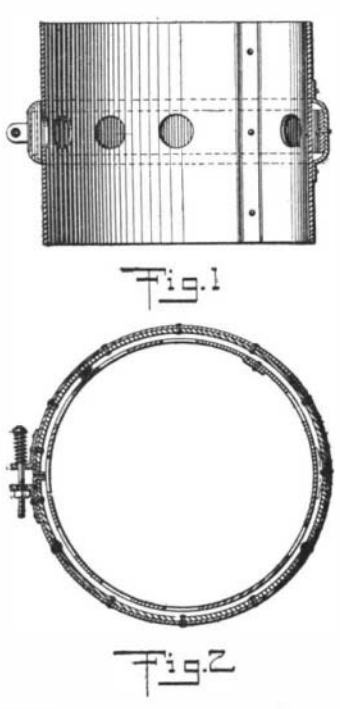
Secure a piece of ordinary window glass, somewhat larger than the largest blue print desired. If a piece the same size as your drawing board can be secured it will be very convenient. Bind the edges of the glass with adhesive tape, to prevent scratching the tracing or hands. Cover the drawing board with felt or other heavy cloth, drawing the covering over the edges and fastening with thumb tacks. Make four clips, as shown in the accompanying illustration using thin spring brass or wire. The exact size of clips depends on the thickness of board and glass.

In use the sensitized paper, which can be obtained from dealers in photo supplies, is laid on the felt coated side up, the tracing to be copied is placed in position and covered by glass, which must be clean then the clips which hold the whole in position are slipped on at the corners.

THERMOSTATIC REGULATOR FOR SMOKE PIPES.

BY B. A. JOHNS.

The accompanying illustration shows a simple way in which to make a thermostatic regulator that will automatically open passages in the smoke pipe, to admit cold air, thus checking the draft of the furnace, and eventually cooling off the fire. The regulator should be placed as near the furnace as possible. Fig. 1 shows a sectional side elevation of the thermostatic regulator, and Fig. 2 a horizontal section of same. In a short piece of pipe, say about 6 inches long, a number of openings are made. These openings



REGULATOR FOR SMOKE PIPES.

are covered with the thermostatic band, which is made as follows: A ring about 2 inches wide, and about 1 inch larger in diameter than the pipe, is made of galvanized iron. The edges are turned down by hammering, as shown in Fig. 1. These turned-down edges are fitted closely to the pipe. In the recess thus formed, a strip of brass or preferably copper is fitted and riveted very closely, say about 1 inch apart, so that when the copper expands, it will not buckle.

To the above-mentioned galvanized ring, opposite the joint, small lugs may be provided for the purpose of fastening same to the pipe. The ring is now cut at the joint, and the ends turned in and fitted closely to the pipe. Two small lugs are riveted to these ends of the ring, with holes to receive a small stove-bolt. Between the head of this bolt and the lug on one side, place a stiff coil spring. This serves the purpose of regulating the tension of the ring, so as to make it more or less sensitive to heat.

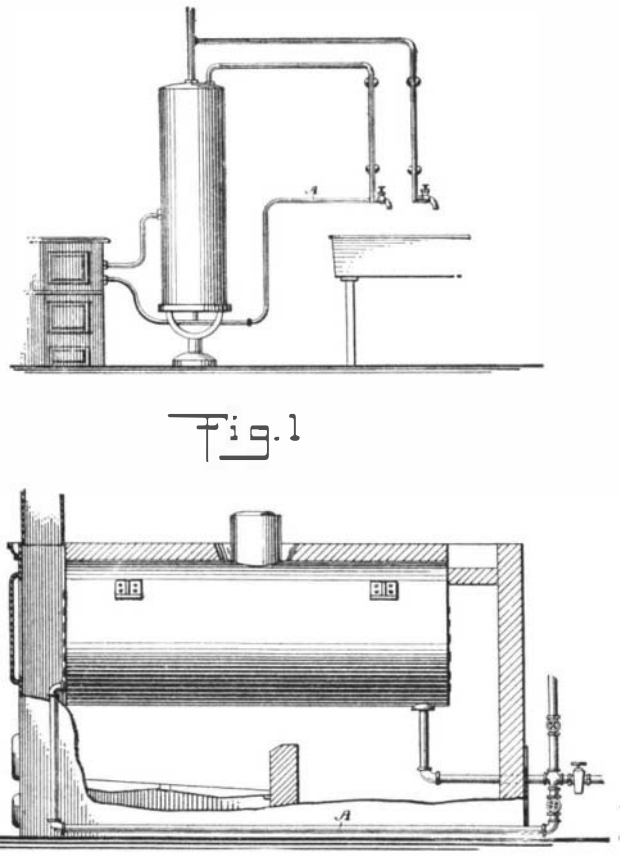
As the fire gets too hot, the copper expands more than the iron ring, causing it to move away from the pipe, and cold air from the outside will pass between this ring and the pipe into the holes of same, thereby checking the draft to the furnace, and preventing it from over-heating.

Under normal conditions, of course, the spring does not open, but only under excessive heat; then it will stay open until the furnace cools off.

CIRCULATING PIPE FOR HOT-WATER FAUCETS.

BY J. A. BEBGSTROM.

In turning on a hot-water faucet, it is always necessary to let the water run for some time before it gets hot. The cause of this is that the water standing in the pipe soon cools off, right up to the boiler, owing to the fact that there is no circulation in same, and of course a great deal of water is wasted. It is an easy matter to overcome this by connecting the back of the faucet to the bottom of the boiler with a small



CIRCULATING PIPE FOR HOT-WATER FAUCETS.

pipe *A*, shown in the accompanying drawing, Fig. 1.

It is now evident that as soon as the hot water in the supply pipe cools off, owing to the change of specific gravity, it will pass downward into the circulation pipe and back to the boiler; and of course a fresh supply of hot water will flow constantly from the boiler to the faucet, and will keep up as long as there is a difference in temperature at the top and bottom of the boiler.

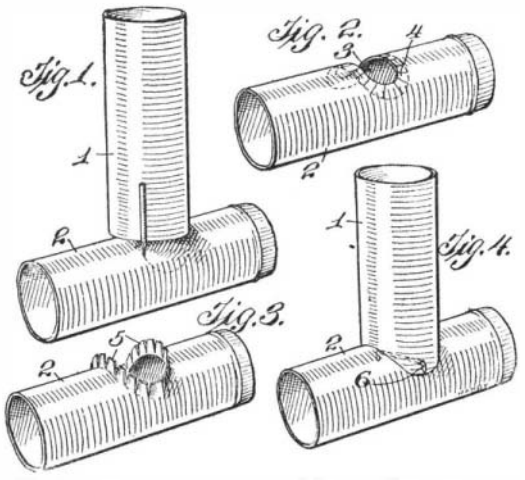
This also holds good in a steam boiler. Fig. 2 shows an ordinary horizontal tubular boiler. Most of these boilers are fed through the blow-off pipe. This pipe is considered a weak part of the boiler, owing to the fact that the boiler is not fed constantly, but at intervals. Therefore these pipes are always required to be covered with asbestos, and sometimes protected from the hot gases by a brick wall. If the boiler were fed constantly, that is to say, if there were a circulation of water in this pipe at all times, the gases would have little effect on same. As soon as the feed water is shut off, or rather between the intervals of feeding, this pipe is full of water, which cannot circulate, and is liable to be overheated and burn. To overcome this, a circulating pipe *A* is connected inside the blow-off cock to some part of the boiler, say to the lower part of the front end. A check valve may be inserted into the line, to prevent the feed water passing through the same. This pipe will at all times establish a circulation in the blow-off pipe, and eliminate all danger of being burned out.

HOW TO CONNECT STOVE PIPES.

BY H. G. L.

The man who desires to connect two stove pipes together and has not the tools ordinarily used for this purpose can do the work as follows:

Place one end of pipe 1 against the side of the pipe 2 at the point where it is to be connected. With pencil flat against the side of pipe 1, as in Fig. 1, trace off the curve on pipe 2. Leaving about 1 inch margin, cut out a disk 3, slit the margin back to the line as at 4, and turn up the tangs 5. Force the end of pipe 1 through the opening, and trace off the curve of pipe 2. Withdraw pipe 1, and cut off the end as marked. Now fit the pipe 1 into place with the tangs



SIMPLE METHOD OF CONNECTING STOVE PIPES.

5 on the inside, and bend the tangs up to a tight fit. If carefully executed, the joint will be sufficiently tight for all purposes.

To hold the pipes rigidly together, punch small holes through the opposite sides with a sharp punch, and put in a piece of stiff wire 6. Bend the ends of the wire on the outside. The wire should pass through the tangs on the inside.

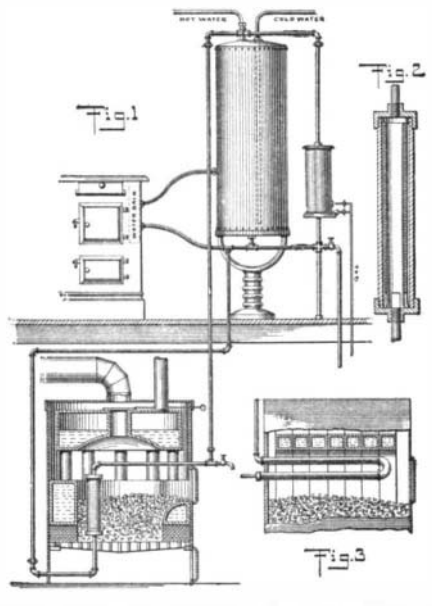
HOT-WATER CONNECTION FOR KITCHEN BOILERS.

BY JOHN B. ALLEN.

In houses where the cooking is done exclusively by gas, and with no fire in the kitchen range, in the winter, the question of having hot water in the kitchen boiler has been quite a problem in many a household, especially as it is very expensive to heat this water by gas.

One solution of the problem is to connect the heating apparatus in the cellar with the kitchen boiler, and if this be done properly, there will be an ample supply of hot water at all times; in fact, more than needed in extreme cold weather, besides keeping the kitchen warm, in the absence of any other source of heating. Of course, a steam or hot-water radiator, placed in the coldest part of the kitchen, will improve conditions in severe weather.

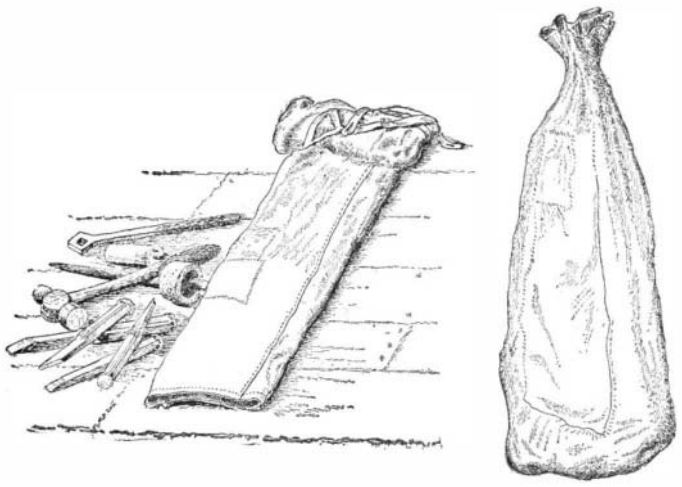
It must be understood that it takes a little more coal to run the heating apparatus, although some contend that it does not. Fig. 1 shows a steam boiler in the cellar, connected up with the kitchen boiler, also a separate gas heater, for use in the summer. It will be noticed that there are three independent circulations for the water, which will not interfere with



CONNECTING THE KITCHEN BOILER TO THE FURNACE.

each other—the circulation from the kitchen range, the one from the furnace, and the other from the gas heater. The connection from the furnace, steam, or hot-water heater in the cellar or basement, may of course be varied according to local conditions. The accompanying illustration shows two good and reliable ways of making the connection. Assume that the kitchen range is connected to the boiler in the usual way; then the connection with the furnace is made

as follows: Unscrew the hot-water connection on top of the boiler, and insert a street cross; if this cannot be obtained, two street tees will answer the purpose. Then replace the hot-water connection in this cross, as before. From one of the side outlets of this cross run a pipe line to the furnace, and from the other to the gas heater. It is well to start and finish the lines with a union, as it is then an easy matter to disconnect them in case the kitchen boiler gives out, or any repairs are needed. The line from the boiler is run from top of same into the furnace, thence down through the fire pot and grate, in such a manner that it does not interfere with the proper working of the latter. Thence through the side of the ash-pit, and up to the bottom of the kitchen boiler. It is now evident that as the water in the heating pipe inside the furnace is heated, it rises, and fills the top of the boiler, forcing the cold water out at the bottom.



HOW TO CONVERT A PAIR OF OVERALLS INTO A TOOL BAG.

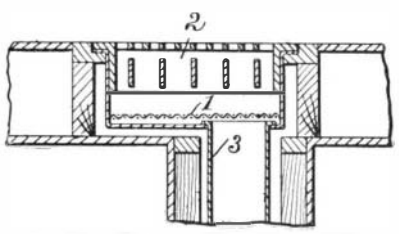
Fig. 2 shows a cross section of the heating pipe, inside the furnace. It consists of a short piece (say 2 inches) of extra heavy black pipe, threaded at each end to receive reducing caps, which connect with the pipe line. Inside this pipe is another, 1½ inches in diameter, which leaves only a small space for the water to circulate in; that is to say, the water is spread out in a very thin sheet, which very easily heats. Three small sections on top and bottom of this pipe, about ⅛ inch wide, are turned outward, so as to fit the inside diameter of the outside pipe, and thereby keep it central. Outside the furnace is placed a faucet or stop-cock, so that the sediment may be drawn off, which should be done at least once a week.

Fig. 3 shows the other arrangement of a heating pipe inside a sectional boiler. In the back of the boiler, over the fire line, drill two holes, about 3 inches above each other, into which insert the pipes, about 2 inches in diameter, reaching nearly across the entire fire space. Connect the same with a return ell, or make it up with ordinary pipe fittings. At the outside of the boiler, reduce these pipes to the regular size used for the pipe line, which is usually ¾ inch in diameter. Attach a faucet to the lower one, and connect it to the bottom, and the higher one to the top of the kitchen boiler. Care should be taken, in running the hot-water pipe from the boiler, not to trap it, that is to say, not to let it drop on the horizontal run, but rather give it as much of a rise as possible. If the run from the furnace to the boiler is very long, the hot-water pipe may be covered with asbestos or the like. A stopcock may be put in either or both lines, so that the water can be shut off, in case of repair. The gas heater is connected at the top and bottom to the top and bottom respectively of the boiler.

A SCREEN FOR THE REGISTER.

BY J. A. BROPHY.

A simple and very effective means for preventing articles dropped on the floor from falling down the hot-air pipes is shown in the accompanying illustration. Cut a piece of wire mosquito netting, 1, the size of the floor opening. By lifting out the floor register, 2, the netting can be placed over the opening in the hot air pipe, 3, as shown. Better still, bend a piece of stiff wire to the shape of floor opening, and after turning the edges of netting over this frame, sew the netting to the frame with fine wire. Galvanized wire netting is preferable to the painted netting. The writer has been able by this method to reclaim several articles of value that had dropped into a floor register.



A SCREEN FOR THE REGISTER.

THE BOILER MAKER'S TOOL BAG.

BY A. F. BISHOP.

When the boiler maker gets a rush order for repairing a boiler he gets busy. Quickly converting his overalls into a tool bag, he drops in half a dozen chisels, expander, hammer, etc., and then he is ready for action. In making the bag he places the overalls full length on the floor, folds one leg up and lays it on the seat of the overalls, then rolls the two very tightly together, criss-crosses the suspenders and ties them on the part which appears in illustration. He then puts his hand inside the leg left full length and grasps the roll and turns the whole thing inside out. This completes the bag which is ready to receive the tools, which, of course, come against the outside of the overalls, leaving the side that comes next to his garments as clean as ever.

COATING ROOFS WHITE TO REPEL HEAT RAYS.

BY A. J. JARMAN.

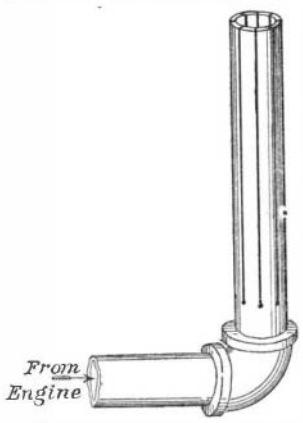
The almost general practice of painting the metal covering of the roofs of houses with the red or chocolate-colored oxide of iron, is one of the causes of the insufferably high temperature of top rooms or attics during the summer months. Although good as a covering for metal, this paint because of its color absorbs the heat rays and conducts the heat to the interior. The roof-covering material is not always metal. If tar paper or tar felt and gravel have been used, no kind of white paint will retain its color upon them. If the covering is zinc, this metal is apt to prevent the adherence of paint, particularly when new. Although white paint made with oil and driers can be used upon a roof previously covered with chocolate-colored paint, another material must be used for a tar and gravel roof. To secure a thoroughly adhesive coating upon new zinc, brush over the metal the following mixture: Sulphate of copper two ounces, chloride of copper two ounces, salammoniac two ounces, water one gallon. When the salts have become dissolved, add two ounces of spirit of salt (common hydrochloric acid). Allow this to dry upon the zinc for about twenty-four hours, when it will be found that any kind of oil paint will adhere perfectly to the zinc.

For a tar roof, use a freshly-made mixture of lime wash, moderately thick and hot. Two coats of this will adhere firmly to the tar, and retain its white color, as well as becoming very hard and resisting rain without washing off. If the lime mixture has become cold, the hardening property will be lost. In that case, to every pailful add a double handful of common salt. Stir in well until dissolved. This will revive the hardening quality. The interior of the rooms with roofs painted or lime-washed as above, will be found from ten to twelve degrees lower in temperature.

A MUFFLER FOR GAS ENGINES.

BY ALFRED P. MORGAN.

The handy man who has a gasoline engine in his shop and which exhausts outside into the atmosphere may silence that disturber of the peace somewhat in the manner shown in the accompanying illustration. It removes the sharp penetrating quality of the noise without causing any back pressure. The end of the exhaust pipe, which must be vertical in order to prevent clattering of the segments, is split into eight parts by means of longitudinal cuts made with a hack-saw. The cuts should extend for three or four feet in the pipe.



SLOTTED EXHAUST PIPE SERVES AS A MUFFLER.

TO PREVENT COAL GAS.

BY L. G. HANDY.

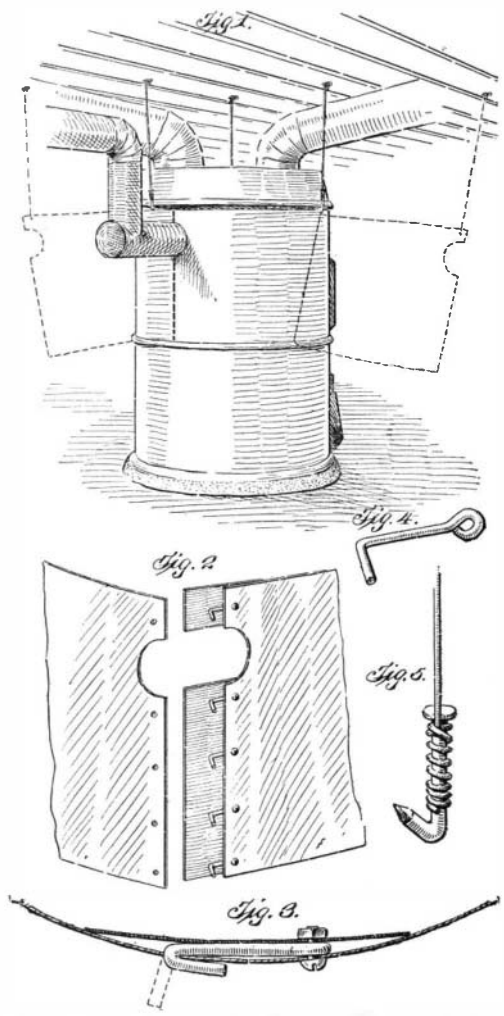
The extremely objectionable presence of coal gas in a furnace-heated house is really a simple thing to prevent. It is due, of course, to leaks in the air ducts through which the gas generated in the furnace enters and mixes with the fresh air that passes to the rooms above. To gain access to the interior of the furnace so as to stop the leaks may appear to be a task quite beyond the average amateur's capabilities, but the accompanying drawings show how the writer succeeded in doing the trick in a simple way.

The top of the furnace, carrying the heating pipes, rested upon a cast iron ring and it was a simple matter to raise the whole thing bodily by the arrangement shown. Three strong hooks were made out of large nails and under the head of each a piece of stout wire was fastened. The hooks were slipped under the iron ring. The ring was raised and the wires wound upon heavy nails driven into the beams overhead.

A 1-inch lift was sufficient and did not interfere with the heating pipes in any way, but relieved all weight from the main band of the furnace and left it free to be laid open. This was done with a pair of tinner's shears. The band was simply slit at the back where the heavy dotted line appears on Fig. 1. The two ends were spread apart and temporarily supported by wires to the rafters. The entire interior of the air box was now accessible.

Several open cracks were found. Through these the gases of combustion had passed freely into the fresh-air compartment and thence to the rooms above. A can of asbestos cement was obtained from a hardware dealer. All surplus rust was scraped off from around the cracks with an old knife and the cement was applied freely. Care was taken to squeeze enough into the cracks to insure a good hold. All cracks were treated in this way and the important part of the job was finished.

To reconnect the ends of the band five small holes were punched an inch from each of the two edges and exactly opposite each other. From a piece of heavy iron wire five hooks were bent to the form shown in Fig. 4. These hooks each measured 2 inches from the center of the eye to the bend. A strip of galvanized sheet iron about 8 inches wide was punched with holes to correspond to those in one end of the band. Small bolts, about ⅝ inch long, were used to bind all firmly together. The free ends of the hooks were now passed through the holes in the opposite end of the band and bent down. The strip of sheet metal on the inside formed an effective seal, as clearly shown by the section, Fig. 3.



METHOD OF REPAIRING A LEAK IN THE AIR DRUM OF A FURNACE.

The band being closed, the top was now lowered, and the furnace was ready for use. The whole job consumed slightly over three hours.

The cement may need to be removed next year, and, to facilitate this task of the future, the hooks were conveniently looped up into the rafters. The back may be readily reopened by bending up the ends of the hooks, and to repeat the work should not take more than an hour.

Since this job was completed, my fire has been made three times without the slightest trace of smoke or gas in the house.

In the Revue de Métallurgie, Le Châtelier advocates autogenous welding for the repairing of marine boilers. Referring to the important work that has been done, especially in Germany, in the welding of fire-boxes to boilers by the aid of water gas, he expresses the conviction that the same work could be done better by the autogenous process. A large French shipbuilding company is employing the process in order to dispense with riveted joints in the parts of boilers that are exposed to fire heat, and in one case, it is stated, the bracket supporting the grate of a boiler has been replaced by a fitting welded to the metal of the grate and of the fire-box.