place so as to leave room for 8-inch division and sidewalls. Fill the forms with mushy wet concrete. At the proper heights insert the 5-inch drain tile through the holes in the forms. Be careful that the outside end of the inlet tile to the charge tank is 2 feet and its other end 16 inches above tank bottom. The pipe leading from the charge tank is also set at the same sharp slope. The outlet tile from the discharge tank is 2 feet above bottom and with both ends level. By this arrangement of pipes, the sewage is kept in the tank to the depth of 2 feet and the ends of the tile in the charge tank are trapped or air-sealed, which aids the activity of a certain kind of bacteria. Likewise, other bacteria are developed in the discharge tank by means of the free circulation of air through the discharge drain tile and holes in the manhole cover.

After the sidewalls are three days old, floor over the top of the forms and prepare to lay the 4-inch concrete top. As molds for the manhole covers, have the tinner make two round bottomless dishpans, 18 inches in diameter at the bottom and 24 inches at the top. Grease these tin molds and set one on the wooden floor over each compartment. Bore six 1-inch holes in the floor inside the one manhole mold over the discharge tank and insert in them greased pegs projecting upward six inches.

Place one inch of concrete over the entire floor and at once lay on it, crosswise the tank, strips of heavy woven-wire fencing 5 feet 2 inches long, or ⅜-inch rods running in both directions and spaced one foot. Likewise reinforce the manhole covers. Immediately place the remaining 3 inches of concrete and do not stop until the tank top and manhole covers are finished. Provide two lifting-rings for each cover by setting in them halves of old bridle-bits, or hitching-post rings, fitted with knobs of wire or with nuts and large washers. If a square wooden manhole mold is used, the concrete cover cannot be cast at once. In such case, carefully remove the wooden manhole form five hours after the top has been finished. Three days later mold the cover the same as for the tin form with this important exception—place heavy paper or cardboard around the edges of the opening to prevent the fresh concrete of the cover from setting to the old concrete.

When the top of the tank is ten days old, lift off the manhole covers, saw openings in the wooden top and remove the forms. In the holes made in the sidewall by the greased wooden pegs, insert ½-inch bolts and set them with mortar. To these bolts fasten the 1 by 12-inch wooden baffle-board which extends across the tank and breaks up the current of the inflowing sewage. To carry the sewage from the house to the tank, use 4-inch sewer pipe laid with tight mortar joints. Connect the discharge end of the tank with a string of drain tile.

The materials required for the tank described above are 5½ cubic yards of crushed rock, 2¾ cubic yards of sand and 9 barrels of Portland cement. If good pit gravel is used, no additional sand will be required.

When the septic tank is two weeks old it may be put to use. It will need cleaning at intervals of two to three years. By its use the health of the family will be protected and life in the country home will be made much more comfortable.

A NEW LINE OF BLOWERS DESIGNED FOR TURBINE DRIVE.

It is an established fact that turbines driving pumps or blowers in power plant service, where the exhaust is used to heat feed water or for steam heating, are more economical than the main driving units, even if these are run condensing. With the exception of a slight loss through radiation, what heat is not converted into mechanical work is either returned to the boilers or utilized, so that the heat efficiency closely approaches 100 per cent. This certainly commends turbo-auxiliaries as economical as well as reliable to maintain over-all plant efficiency.

However, as is well known, turbine power increases with the revolutions per minute up to a best speed that is invariably higher than that of ordinary turbine pumps or ordinary blowers. The writer has in mind a small steam turbine that develops 15 brake horsepower at 1000 r.p.m. and 40 horsepower at 3500 r.p.m. with the same pressure and total steam per hour. A larger turbine of another type develops 80 brake horsepower at 600 r.p.m. and 160 brake horsepower at 1600 r.p.m. with the same pressure and total steam per hour. The best pumps or blowers for these two turbines would therefore be the ones having economical speeds close to the higher turbine speed figures in each instance.

With these considerations in mind, Mr. C. V. Kerr, inventor of the original Kerr Turbine, has designed, and McEwen Brothers of Wellsville, N.Y., are now marketing a

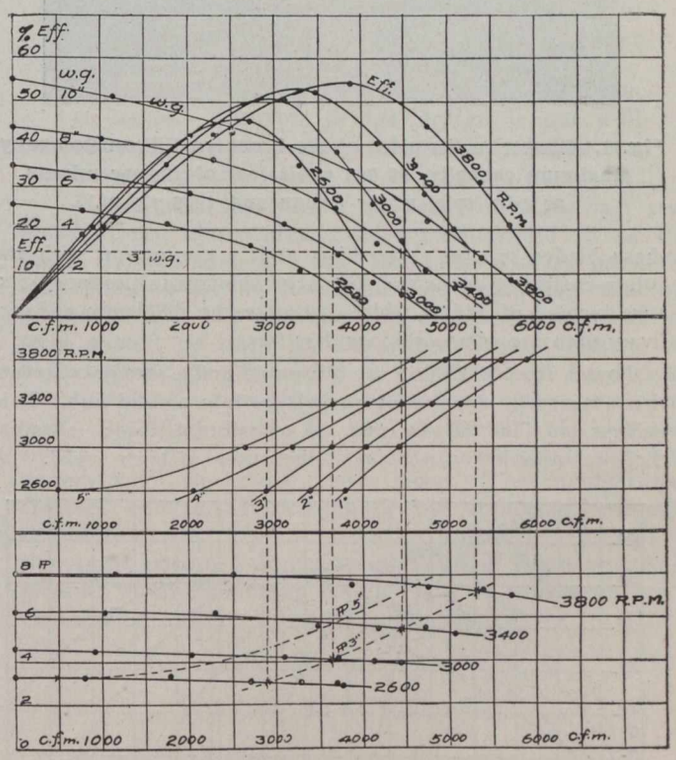

Fig. 1. Test of 16-in. Blower with helical impellers.

new line of pumps and blowers for turbine drive, having best speeds practically the same as those for the turbine and having an economical range within 25 per cent. above, to 25 per cent. below, rated capacity.

The blowers, are built in two types, the smaller sizes with double helical runners and the larger with increase pitch propellers. The manufacturers claim for both types a unit economy or steam per air horsepower better than ever reached before, especially on forced draft pressures. Both types have the runners opposed and balanced for high speed and have a central deflector to prevent cross flow. The runners are removable endwise and may be reversed on the shaft for right or left hand discharge. The bearings are lead-bronze, or babbitt lined, ring oiled and dust proof. The helical runner type has a solid cast-iron volute, and the propeller type is made with cast-iron sides and steel volutes.

The former, is designed especially for forced draft for forges and furnaces and in connection with underfeed stokers. Tests on a 16-inch blower of this type, and made with a