

by plungers, pistons, impellers, screws or similar devices, but by a piston of compressed air. The mechanism for opening the valve to admit the compressed air as, for instance, a

By cutting off the air supply at a pre-determined point expansion occurs during the discharge of the remaining volume, so that the air is released from the ejector body at a pressure approximating that of the atmosphere instead of the full pressure of the air in the storage tank.

Centrifugal and Plunger Pumps.—If the sewage is thoroughly screened, a centrifugal pump will handle it at somewhat lower efficiency than that when handling pure water, as the solids and grit and grease which cannot be screened out cause corrosion and incrustation of metal parts. Screens must always be supplied, but even these will not prevent rags and other foreign matter from entering the pump impellers where they are passed with difficulty and very often become entangled and cause vibration and reduction of the pump capacity, and eventually requiring a shut-down.

By making the screens finer, a larger proportion of the solids may be prevented from entering the pump, thus increasing its reliability but, on the other hand, necessitating more frequent cleaning of the screens and more careful attention to the working of the plant. The

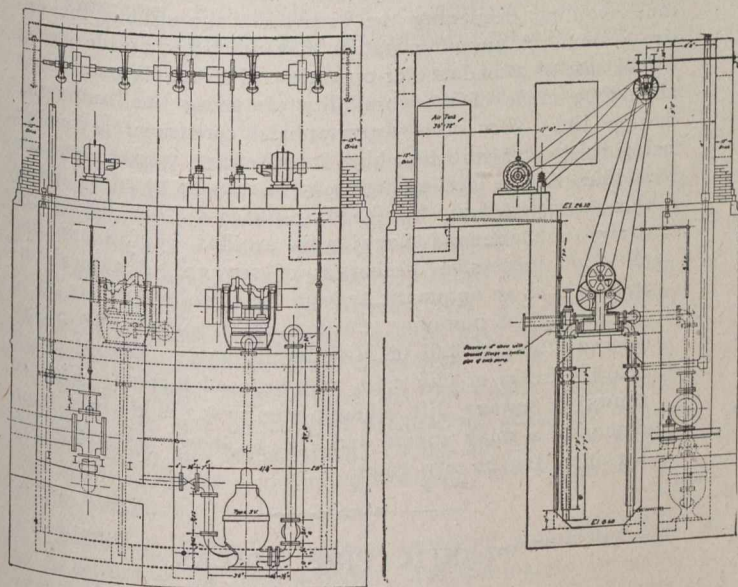


Fig. 6.

float rising with the sewage, may also be replaced by a piston or spring of compressed air which acts upon a suitable diaphragm in the valve mechanism. By this arrangement all moving parts are entirely eliminated in every stage of the operation of the ejector, nothing coming in contact with the sewage but air.

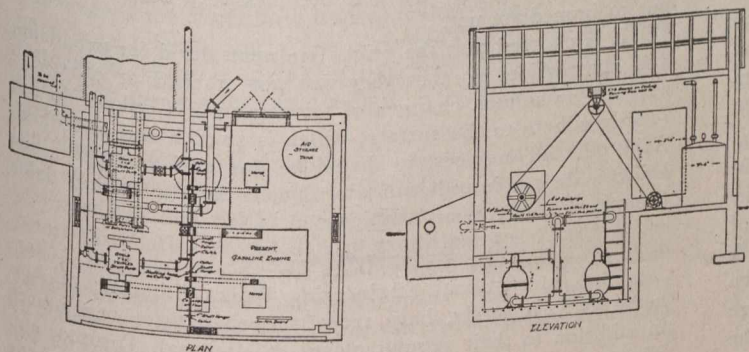


Fig. 7.

But while the pneumatic ejector is very reliable, it is open to some objection on the grounds of inefficiency in large plants operating continuously. In small plants, the reliability of the pneumatic ejector and the fact that it handles crude and unscreened sewage and thus requires no attendance, cleaning of screens, and is entirely fool-proof make the question of efficiency of minor importance. This is even more the case where the sewage flow is intermittent. The compressor automatically maintains the air supply in the tank and when there is no demand the air compressor is shut down. The ejector does not operate until it is filled and it may discharge once an hour or twice a minute, depending upon the rate at which sewage gravitates to it. On the other hand, a small pump of the centrifugal or plunger type may be operating for long periods at far under its full capacity, thus underloading the driving motor as well, with resulting fall in efficiency.

The main reason for the higher efficiency of the pump, as compared to the pneumatic ejector, is that with the pump the drive is direct, whereas, with the pneumatic ejector the driving motor must first compress the air, which in turn discharges the sewage, but an improvement in the efficiency of ejectors is obtained, however, by using the air expansively.

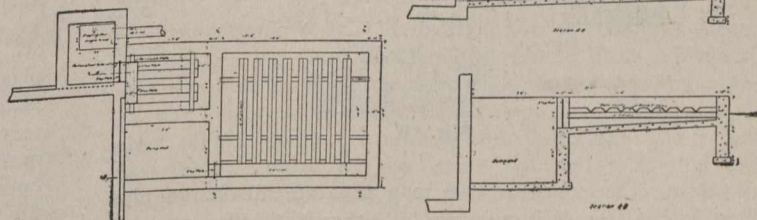


Fig. 8.

accumulation of screenage becomes foul and dangerous to health and the removal of the screenings themselves is costly and troublesome.

Priestman Natural Compound Pumping System.

The ordinary stationary screens have not proved satisfactory, as pointed out, because they require constant attention and become rapidly choked and the removal of the screening is very objectionable and costly work. But screens cannot be done away with or else the pumps will clog. The Priestman natural compound

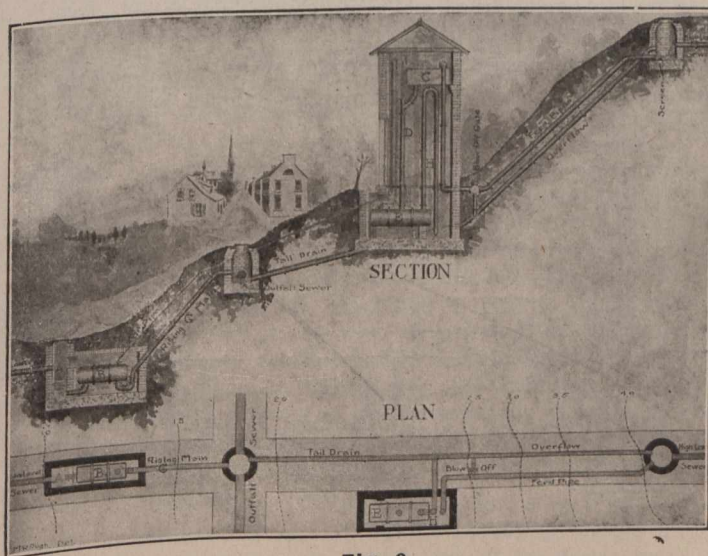


Fig. 9.

pumping system has been perfected in order to overcome these difficulties by separating the solids in the sewage from