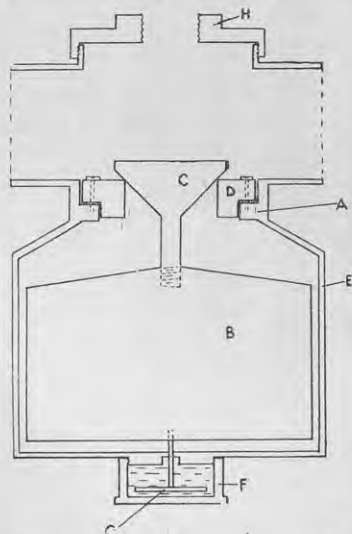


# Improved Vacuum Relief Valve Developed by Department of Agriculture Officer

**M**ENTION was made in an article in the "Journal of Agriculture" for December, 1939, and January, 1941, of an investigation into the properties of relief valves and of work on the problem of relief valve design being carried out at Wallaceville. A full report on the results of our work on relief valves will appear in the "N.Z. Journal of Science and Technology." The present article describes an improved valve which has been developed at Wallaceville, and which, after vigorous test, has proved itself to be superior to any valve yet examined.

As a result of our studies on relief valves we suggest the following as a suitable standard of performance.

When the valve is adjusted to blow off at a 15 inches vacuum with a flow of air (at room temperature and pressure) through it equal to 0.10 cubic feet per second, the vacuum should not vary any more than one inch of mercury between the limits



Components of damped weighted vacuum relief valve.—A, Main casting. B, weight. C, conical valve head. D, removable valve seat. E, damper support bracket. F, damper (containing oil). G, damper piston. H, valve cover cap (with provision for screwing in vacuum gauge).

By  
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of 0.00 and 0.10 cubic feet per second air flow through the valve.

A valve reaching this degree of sensitivity is desirable on a milking machine because, firstly, it will in no circumstances permit the vacuum to rise to dangerous levels, and, secondly, it will close completely immediately the vacuum falls by one inch of mercury, thus preventing unnecessary loss

of vacuum. However, while it is possible to obtain such sensitivity in a variety of ways, the valve must be robust, stable, and reliable. There are a few valves on the market which approach the above standard, but they are unstable. Further, the valve must be of reasonable cost and not liable to become contaminated.

As a result of earlier work on this subject, a diaphragm type of valve was evolved which was very sensitive and fairly robust. It was, however, too costly to produce. We were, therefore, compelled to turn to a different principle. It was evident from our studies on different types that two factors were, in the main, responsible for loss of sensitivity in a valve—(1) friction in the guide, and (2) pressure drop across the inlet ports. These have been reduced to negligible proportions in the new valve and stability has been maintained. When reliability is wanted the weighted valve is ideal. Further, such valves may be con-

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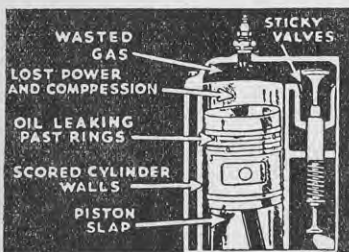
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