A potato fertilizer experiment in factorial design with nitrogen applied at the rates of 60, 90, and 120 pounds to the acre; phosphoric acid at the rates of 120, 160, and 200 pounds to the acre; and potash at the rates of 80, 140, and 200 pounds to the acre, was planted with this machine. All possible combinations of these three quantities of the three elements, 27 in all, were included in the experiment which was planted on 486 three-row plots. Although 2,384 changes of the control levers were made while planting this experiment, the time required for the planting was very little more than would have been required if but a single fertilizer had been used. It is not necessary to stop the machine for changes that require moving only one or two levers.

It was the intention to make a machine with a number of hoppers that could be operated independently of each other but being unable to obtain the type of hopper desired the machine on hand was altered as described. For experiments involving more factors, separate hoppers would be required, but for the purposes for which it was designed this machine works very well.

Fig. 1 shows the division of the hopper into three compartments, the location of each, and gives details of the gate assembly, the control levers, and the partitions.—P. H. Wessels, Long Island Vegetable Research Farm, Riverhead, N. Y.

DEFEATISM IN AGRONOMY

Not long ago this writer forwarded to the presidents, deans, and leading agronomy professors of the agricultural colleges and to the directors of the experiment stations a communication entitled, "The education of an agrobiologist; an address to the directing heads of agricultural instruction in the United States". This communication evoked numerous responses. The drift of comment by the agronomists is more or less fairly represented by the one reproduced below, which is from a Research Professor of Agronomy in a New England state college:

'I would like to raise some objections of a practical nature which to me would seriously hinder any general, practical application of the principles you have outlined. You state: 'An environment that has been standardized in respect to unit space, temperature, moisture, etc. . . . ' which unfortunately does not exist under practical field conditions. The most important disturbing element, particularly in New England, is the weather. We have no means whatsoever of determining what the weather will be one season to the next, and this may be the most important factor influencing crop yields. I recall a statement made by Professor Bender of the New Jersey Station a year ago to the effect that an experimental plot of Ladino clover yielded 25 tons of green forage to the acre one year and the next year, a drought year, the same area yielded 5 tons of green forage to the acre. How can such a variation as this be accommodated in any mathematical formula? In areas where the climate is tempered by great bodies of water, and where natural soil fertility conditions are very low, I can understand where agrobiology would work out fairly