To all whom it may concern:

Be it known that I, Paul Bédarrides, engineer, a citizen of the Republic of France, residing at 4 Rue de la Verrerie, Paris, in the 5 Republic of France, have invented certain new and useful Improvements in an Elevator for Granulous or Pulverized Products, of which the following is a specification.

The present invention relates to an apparatus for elevating granulous or pulverized products, especially grain, and which is particularly arranged in view of providing for a continuous elevation of the products by means of the vacuum obtained by an ejector of steam in a separating-chamber, where the blast of air which carries forward the products separates itself from the latter in order to allow the same to run, whether in a continuous manner or not, into the bags or other receptacles. The novel application of an injector of steam to produce a vacuum in the suction conduit or pipe offers great advantages over the pumping apparatus which might be used for the same purpose, in that the injector of steam produces a uniform suction and one which can be easily regulated at will, that the said ejector is not at all encumbering and can be fitted up anywhere without any difficulty, and that its efficiency is comparatively high.

The accompanying drawings show by way of example one form of my elevating apparatus in which an ejector of air is used in connection with the ejector of steam in order to elevate heavy grain; but this auxiliary ejector can be dispensed with when the grain to be elevated is light.

Figure 1 is a vertical section of the apparatus taken all together. Figs. 2 and 3 are respectively a vertical and horizontal section of the chest in which the air and grain are separated, and Figs. 4 and 5 are longitudinal sections of the ejector of steam and of the ejector of air.

The ejector, which dips very slightly into the mass of grain to be elevated, is connected by a pipe 21 to a part 3, the two branches of which communicate, respectively, with two compartments 4 and 5, formed in a chest 0, by an air-tight partition f. The said compartments communicate, respectively, with two pipes 8 and 9 of a three-way cock 10, so that they can be connected alternatively by means of the said cock with the suction-pipe 11 for the air. Near the end of the said pipe 11 is fitted the ejector by means of steam-ejector 12, of which the body part 13 is supplied with steam under pressure by a pipe 14, connected to a boiler.

Into the bottom of the compartments 4 and 5 open chutes 15, either vertical or inclined to about forty-five degrees, and which open at their other ends above the place where the grain is to be discharged. The lower orifice of the said chute is provided with a flap-valve 65, opening downward, a cock, or other similar device. Each of said compartments 4 and 5 is also partly divided by a partition 17, which prevents the commingled air and grain from passing directly from the pipe 21 to the pipe 11. The presence of the said partition and the slower speed brought about by the undivided part of the chest 6 have the effect of causing the grain to fall by gravitation to the bottom of the chest and thence into the chutes 15, while the air only passes into the cock 10 and the pipe or conduit 11.

The compartments 4 and 5 are also provided with cocks or air-inlets 18 for the air and with the flap-valves 19, arranged on the orifices of the two branches 3, so that the said valves can open inward into the said chest 6.

Under the action of the jet of steam or of other compressed fluid in the ejector there is produced in the one or the other of the compartments 4 and 5, according to the position of the three-way cock 10, a vacuum which gives rise in the pipe 21 to a fast current of air which carries forward with it the grain located adjacent to the orifice of the said ejector. By the action of the vacuum in the pipe 15 the flap-valve 16 has a tendency, on the contrary, to close itself. The grain elevated into the chest 6 settles there and fills the chute 19, so that the weight of the said grain would have a tendency to open the flap-valve 16 were the chute to be of sufficient height. In case the said flap-valve 16 does not open automatically it is opened by hand after the chute 15 has been filled and after turning the cock 10 and opening the cock 18. While the grain is running from one compart-
ment, the other is being filled, so that the operation of the apparatus may consequently be considered as being continuous.

When the height of the chute 15 is sufficient to cause the flap-valve 16 to open of itself and to give rise to the passage of as much grain as that which is being elevated by suction, it is obvious that one of the compartments 4 or 5 will suffice for the continuous operation of the apparatus.

Into the orifice of the ejector there opens a mouth 22 for the entrance of air and which is in free communication with the atmosphere by means of a pipe 23, carried upward above the level of the grain, so that the circulation of the air and grain is brought about by the difference between the pressure of the atmosphere and the vacuum produced by the ejector by means of steam. It is obvious that the operation would be the same, but much more energetic, were a blast to be used at the same time as the steam-ejector 12, such blast being connected with the pipe 23. Consequently when the grain or other product is not to be elevated to a great height or when such grain or product is not very dense the air-ejector 1 may be dispensed with.

I claim—

1. An apparatus for elevating granulous products, comprising a closed chamber provided with compartments, a grain-chute leading to said chamber, an ejector for creating a partial vacuum in said chamber, and a bifurcated member provided with a hand-valve for connecting said ejector with said compartments independently.

2. An apparatus for elevating granulous products, comprising a closed chamber provided with separate air-tight compartments, a grain-chute provided with a bifurcated end and connected with all of said compartments, an ejector for creating a partial vacuum in said chute, and means controllable at will for connecting said ejector with said compartments independently.

3. An apparatus for elevating granulous products, comprising a closed chamber provided with separate air-tight compartments, a grain-chute provided with a bifurcated end for conveying said products to said chamber, an ejector for exhausting air from said chamber, and means controllable at will for exhausting air from said compartments independently.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

PAUL BÉDARRIDES.

Witnesses:
MN. DE PAZZI,
AUDRAN MORET.