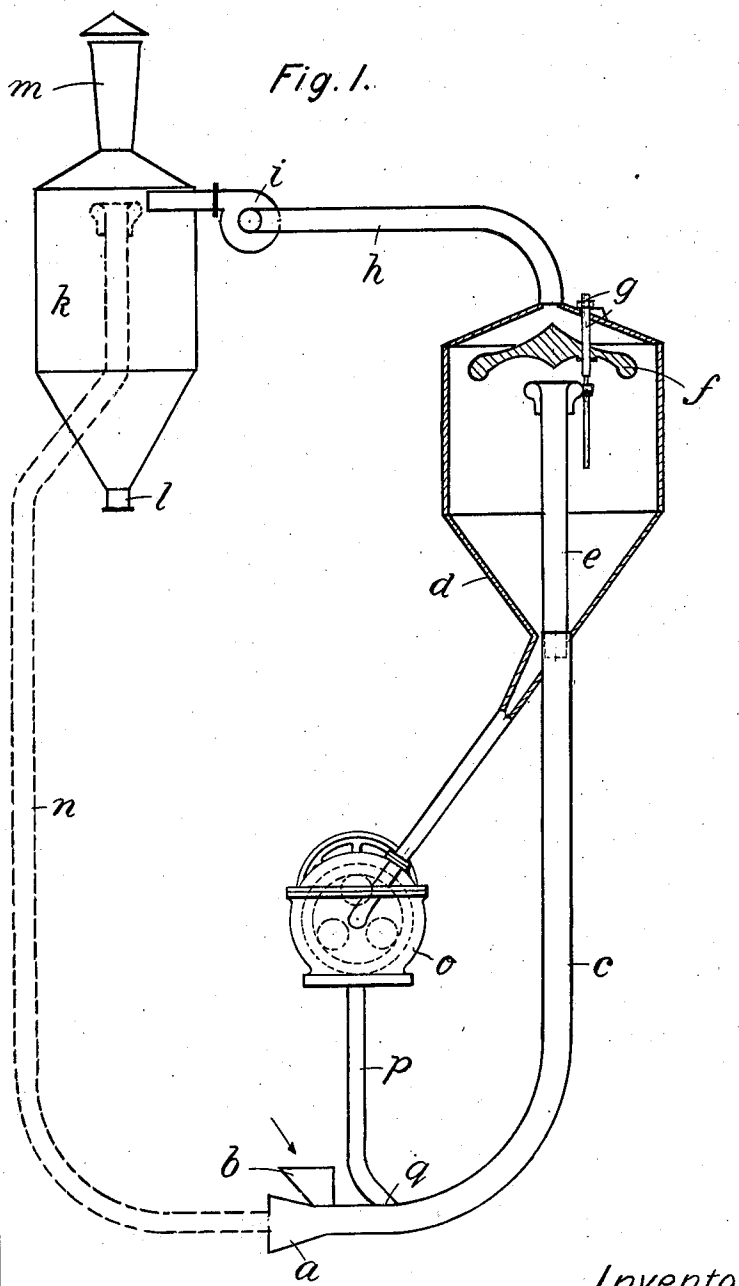
July 12, 1927. 1,635,527

E. BARTHELMESS

PNEUMATICALLY FED CRUSHING AND SIFTING DEVICE

Filed Aug. 15, 1925

Fig. 1.



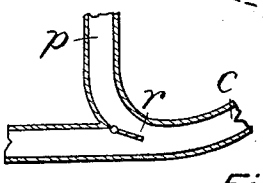


Fig. 2.

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PNEUMATICALLY-FED CRUSHING AND SIFTING DEVICE.

Application filed August 15, 1925, Serial No. 50,481, and in Germany August 22, 1924.

This invention relates to a crushing and separating device of the kind in which the materials are fed by suction through a separator where the coarse materials are divided off by gravity and returned through a crusher to the feeding duct.

This return of the materials to the feeding duct entails difficulties owing to the return pipe being under the influence of the suction in the separator.

The object of the present invention is to obviate these difficulties, and the invention consists in neutralizing the suction effect in the return pipe by arranging the latter so that it opens into the feeding duct in the direction in which the air and the materials travel. An injector effect will thus be obtained whereby the materials are attracted from the crusher to the feeding duct and whereby the suction produced at the separator end of the pipe is neutralized. Preferably, a gravity-operated flap is arranged at the junction between the feeding duct and the return pipe, in advance of the latter, so that, while it can yield to let the materials pass through, it tends to close the feeding duct. This arrangement intensifies the injector effect and induces the coarse material to separate easily from the finer materials and return to the crusher.

Fig 1 of the accompanying drawings represents a diagrammatic view of the arrangement, and

Fig. 2 is a diagrammatic view showing the arrangement of the flap in the feeding duct.

A pneumatic separator *d* contains an upright pipe *e* over which a deflecting plate *f* is arranged. The pipe *e* is connected to the feeding duct *c* which has and air-inlet *a* and which receives fresh materials from a hopper *b*. A pipe *h* connects the separator *d* with an exhauster *i* which sucks air through the duct *c* and through the separator. The materials are carried along by the air current and are deflected by the plate *f* which is suspended on bolts *g* whereby its distance from the pipe *e* can be regulated. The finer materials are carried along to the exhauster *i* which delivers them into a silo *k* having a sacking nozzle *l*. The coarser materials fall by gravity to the bottom of the separator where they enter the pipe *p* which returns them, through a crusher *o*, to the feeding duct *c* at *q*. The pipe *p* opens obliquely into the duct *c* in the direction in which the air and the materials travel in the latter. It will thus be subjected to an injector effect which neutralizes the suction at the separator end of the pipe and which tends to maintain the coarse materials in circulation until they are fine enough to be delivered to the silo *k*.

Preferably a gravity-operated valve *r* is arranged in the duct *c* in advance of the pipe *p*, as shown in Fig. 2, so as to tend to close the duct. This flap, which opens under the influence of the suction and which also yields to the materials, intensifies the injector effect in the pipe *p*.

A pipe *n* may be led from the silo *k* to the duct *c* so that the air from the exhauster *i* can, after it has been freed in the silo from suspended particles, be returned to the duct for further use. The silo has an air vent *m* through which surplus air, admitted by leakage, can be discharged.

A shifting device of this kind lends itself to the erection of large sifting and crushing plants. It has the advantage that the sifting and feeding of the materials are brought about without mechanical elements other than the exhauster.

I claim:

1. A separating and crushing device comprising a pneumatic separator, a feeding duct having a horizontal portion and a vertical portion which latter rises into said separator, a feeding hopper opening into the horizontal portion of said feeding duct, an exhauster communicating with the upper part of the separator so as to draw the materials through the feeding duct into the separator and extract the finer particles from the latter, a crusher, and a return pipe for leading the coarser particles from the lower part of the separator to the crusher and thence back to the horizontal portion

of the feeding duct, the return pipe being arranged so as to open obliquely into the feeding duct in the direction in which the materials travel, substantially as and for the purpose set forth.

2. In a sifting and crushing device according to claim 1, a gravity-operated flap arranged in the feeding duct at the junction between said duct and the return pipe in advance of the latter so that it tends to close the duct and so that it can yield to the suction and to the materials, substantially as and for the purpose set forth.

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