

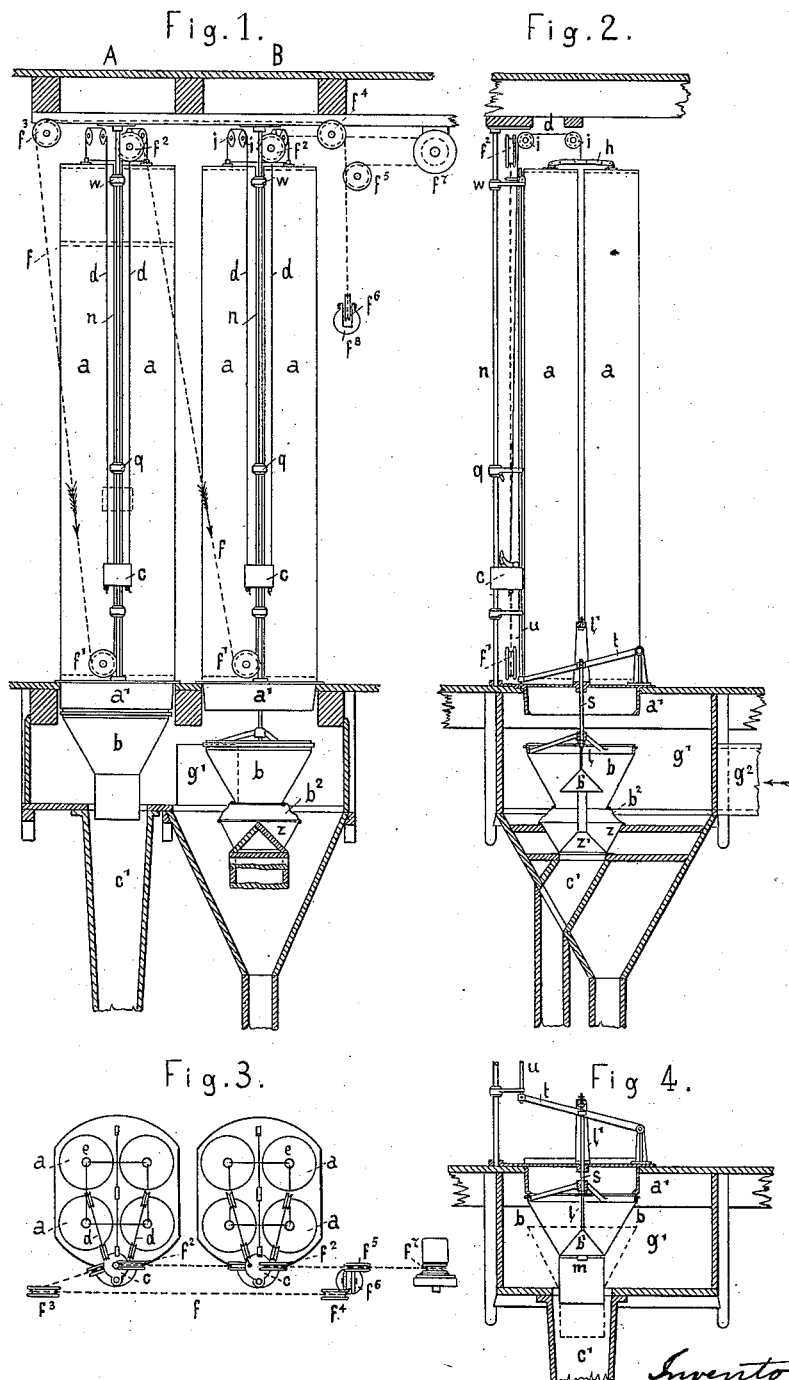
(No Model.)

2 Sheets—Sheet 1.

G. BEHRNS.  
DUST COLLECTOR.

No. 381,753

Patented Apr. 24, 1888.



Attest.  
Edward Stein,  
H. S. Knight

Inventor,  
Gustav Behrns,  
By Knight & Bros  
attys.

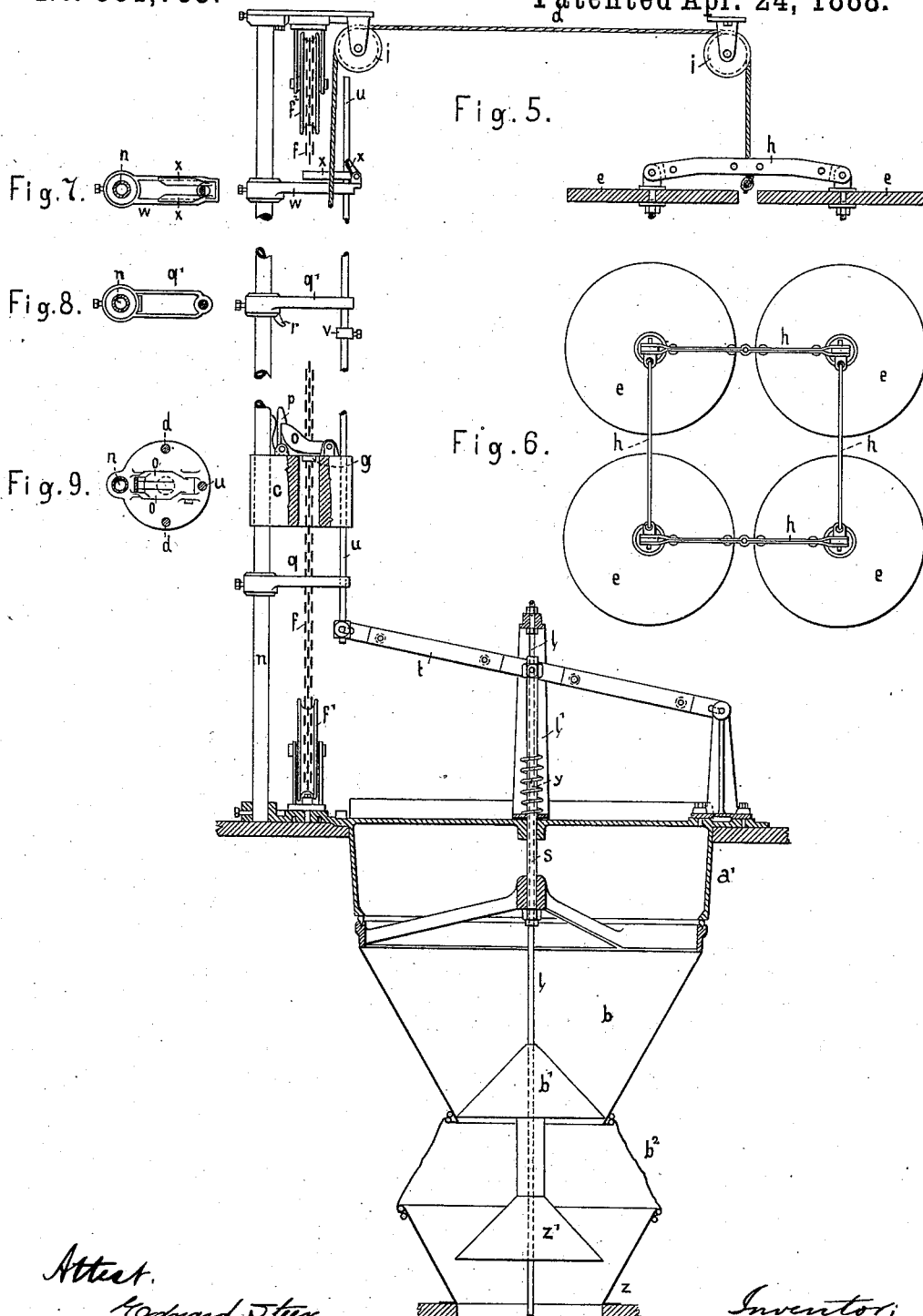
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2 Sheets—Sheet 2.

G. BEHRNS.  
DUST COLLECTOR.

No. 381,753.

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Attest.  
Edward J. Steer,  
H. S. Knight

Inventor:  
Gustav Behrns.  
By Knight Bros.  
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# UNITED STATES PATENT OFFICE.

GUSTAV BEHRNS, OF LUBECK, GERMANY.

## DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 381,753, dated April 24, 1888.

Application filed October 5, 1887. Serial No. 251,534. (No model.) Patented in Germany March 16, 1887, No. 40,856.

*To all whom it may concern:*

Be it known that I, GUSTAV BEHRNS, a citizen of the free State of Lubeck, and residing in the city of Lubeck, German Empire, have invented new and useful Improvements in Dust-Collectors, (for which I have obtained the German patent, No. 40,856, dated March 16, 1887,) of which the following is a specification.

My invention relates to the dust-collector described in the specification of the United States Patent No. 357,060, the said dust-collector substantially consisting of an inverted filtering-bag fixed with its open end to an aperture in the top of a chamber into which passes the dust-laden air, and of means for causing the said bag to collapse at intervals for subsequently closing the same and for re-expanding it quickly in order to produce a back current of air through the pores of the bag, in view of cleaning it from adhering dust, the dust being thereupon removed and the bag reopened.

The improvements constituting my present invention consist in the particular means employed for closing the bag or bags; for allowing them to collapse; for re-expanding them, and for collecting and removing the dust, as hereinafter fully described.

On the annexed sheet of drawings, Figure 1 represents in vertical sectional elevation two dust collectors, A and B, involving my improvements and placed side by side, the collector B showing some features in addition to those of the collector A. Fig. 2 is a transverse sectional view of the collector B. Fig. 3 is a top view corresponding to Fig. 1, and Fig. 4 a transverse section through the lower part of the collector A. Fig. 5 is a transverse sectional view of the operating parts of the collector B, drawn to a larger scale, portions of some of the parts being broken away. Fig. 6 is a plan of the tops of the bags and parts connecting them together. Figs. 7, 8, and 9 are plans of the parts in Fig. 5 opposite to them.

Each collector is preferably composed of four filtering-bags, *a*, closed at the top by wooden disks *e*, and attached with their open lower ends to corresponding apertures formed in the casting *a'*, inserted into the top of the chamber *g'*, which is in communication with

the dust-producing machine (not shown in the drawings) by the conduit *g''*. The said disks *e* are connected together by a frame, *h*, attached to two ropes, *d*, running over the pulleys *i*, the said ropes being secured with their other ends to a weight, *c*, which thus keeps the bags expanded.

The means for causing the bags to collapse consist in a traveling chain, *f*, running over the pulleys *f'*, *f''*, *f'''*, *f''''*, *f'''''*, the tension-pulley *f''''''*, having a weight, *f''''''*, attached to it, and the pulley *f''''''*, keyed on a shaft which is driven by any motive power. The said chain passes through a hole in the center of the weight *c*, and it is provided with collars *g*, while to the weight *c* are pivoted a bifurcated latch, *o*, straddling the chain, and a spring-pawl, *p*, adapted to engage the latch and to keep it down. The chain *f* being put in motion by the driving-pulley *f''''''*, will act with its collars *g* against the latch *o*, each collar in its turn raising the weight *c* and causing the ropes *d* to become slack, so that the tops of the bags are then free to sink. The weight is raised until the pawl *p* strikes laterally against an inclined stationary toe, *r*, whereby the pawl is pushed away from the latch *o* and the latter released, so that the weight, being then no more supported by the collar *g*, descends and re-expands the bags. During its upward and downward motion the weight is guided by the column *n*.

For closing the bags previous to their being expanded and for collecting the dust, the filter A is provided with a vertically-movable funnel, *b*, fitting with its upper rim to the lower edge of the casting *a'*, and a cone, *b'*, adapted to close the bottom orifice of the funnel *b*. The cone *b'* is loosely suspended upon a rod, *l*, secured with its upper end to a frame, *l'*, while the funnel is fixed by means of arms to a tube, *s*, in like manner, as shown in Fig. 5, the said tube being arranged to slide on the rod *l* and pivoted to a lever, *t*, which in its turn is connected to a rod, *u*, guided by the three arms *q*, *q'* and *w*, projecting from the column *n*. The rod *u* passes through a hole in the weight *c*, and it is provided with a collar, *v*, against which the weight strikes when being near the end of its upward motion, so that the rod *u* is thereby lifted. Moreover, there is pivoted to the arm *w*, which is close to the upper end of the rod *u*, a pawl, *x*, having two

arms, one of these arms being adapted to engage in a notch cut into the rod *u*, while through the other arm, which is bifurcated, passes the chain *f*. The said notch is arranged at such a point of the rod *u* that when the rod is lifted sufficiently by the weight *c* to allow the pawl *x* to engage with the notch the funnel *b* will be in its upper position, (see Fig. 1, A, and Figs. 4 and 5,) in which it closes against the rim of the casting *a'*. At the same time the funnel is pressed with the lower portion of its inside surface against the edge of the cone *b'*. It then completely separates the filtering-bags *a* from the chamber *g'*, and the dust dropping from the bags while being exposed to the cleaning operation falls into the funnel and is retained therein by the cone *b'*. After the weight *c* has been released from the collar *g*, which had lifted it, the said collar on coming in contact with the pawl *x* disengages the same from the rod *u*, and the rod drops down, together with the lever *t* and the funnel *b*, until the parts are arrested by a spring *y*, Fig. 5. The funnel then has the position shown in dotted lines in Fig. 4, in which position it leaves free the passage from the chamber *g'* to the bags *a*, while the dust collected in the funnel and upon the cone *b'* drops through the space between these parts into the spout *c'* and thence into a bag to be tied thereto. In the time elapsing between the closing and the reopening of the filtering-bags these may be caused to collapse and to re-expand several times by a repeated lifting of the weight *c*, brought about by a plurality of collars, *g*, fixed upon the chain *f* at suitable distances apart.

In order to insure a complete closure of the bags when the funnel *b* is in its upper position, the cone *b'* is not fixed to the rod *l*; but it is carried by a head or shoulder, *m*, Fig. 4, formed upon the rod *l*, so that the funnel on being raised first strikes against the cone and lifts the same a little and then comes in contact with the casting *a'*.

In the described arrangement of the bag-closing contrivance there is always an open communication between the chamber *g'* and the spout *c'*, and consequently with the bag tied thereto. This communication may be avoided by means of a stationary funnel *z*, Figs. 1, B, 2, and 5, fixed at the bottom to the spout *c'*, and connected at the top, by means of a sleeve, *b''*, of cloth or leather, to the funnel *b*, in combination with a cone, *z'*, integral with the cone *b'*, both cones being fully free to slide up and down on the rod *l*, and the distance of the cones from each other being such that

when the funnel *b* is lifted it will raise the cone *z'* by means of the cone *b'*, whereas when the funnel *b* is lowered the cone *z'*, in settling within the funnel *z*, closes the same, the cone *b'* at the same time coming out of contact with the funnel *b*. Thus in this case a closure of the bags and also of the chamber *g'* is brought about alternately by the two funnels and the two cones, and the dust drops in two steps through the closing device.

I claim as my invention—

1. The combination, with the chamber *g'* and the inverted bags *a*, of the weight *c*, ropes *d*, connected to the weight and the bags, pulleys *i*, for guiding the ropes, traveling chain *f*, passing through the weight and having collars *g*, for engaging and lifting the weight, and means for releasing the weight from the collars, substantially as and for the purpose described.

2. The combination, with the chamber *g'* and the inverted bags *a*, of the weight *c*, ropes *d*, connected to the weight and the bags, pulleys *i*, for guiding the ropes, traveling chain *f*, passing through the weight and having collars *g*, for engaging and lifting the weight, latch *o* and pawl *p*, pivoted to the weight, and fixed toe *r*, substantially as and for the purpose specified.

3. The combination, with the chamber *g'* and the inverted bags *a*, of the weight *c*, ropes *d*, connected to the weight and the bags, traveling chain *f*, passing through the weight and having collars *g*, for engaging and lifting the weight, means for releasing the weight from the collars, funnel *b*, rod *u*, having the collar *v*, means of connection between the rod *u* and funnel *b*, pawl *x*, and cone *b'*, substantially as and for the purpose described.

4. The combination, with the chamber *g'* and the inverted bags *a*, of the weight *c*, ropes *d*, connected to the weight and the bags, traveling chain *f*, passing through the weight and having collars *g*, for engaging and lifting the weight, means for releasing the weight from the collars, funnels *b* and *z*, sleeve *b''*, rod *u*, having the collar *v*, means of connection between the rod *u* and funnel *b*, pawl *x*, and cones *b'* and *z'*, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GUSTAV BEHRNS.

Witnesses:

REED HILDEBRANDT,  
FRIEDRICH BRÜGGE.