(No Model.) 2 Sheets—Sheet 1.

W. JONES.

SAMPLING APPARATUS.

No. 359,158. Patented Mar. 8, 1887.

Fig. 1.

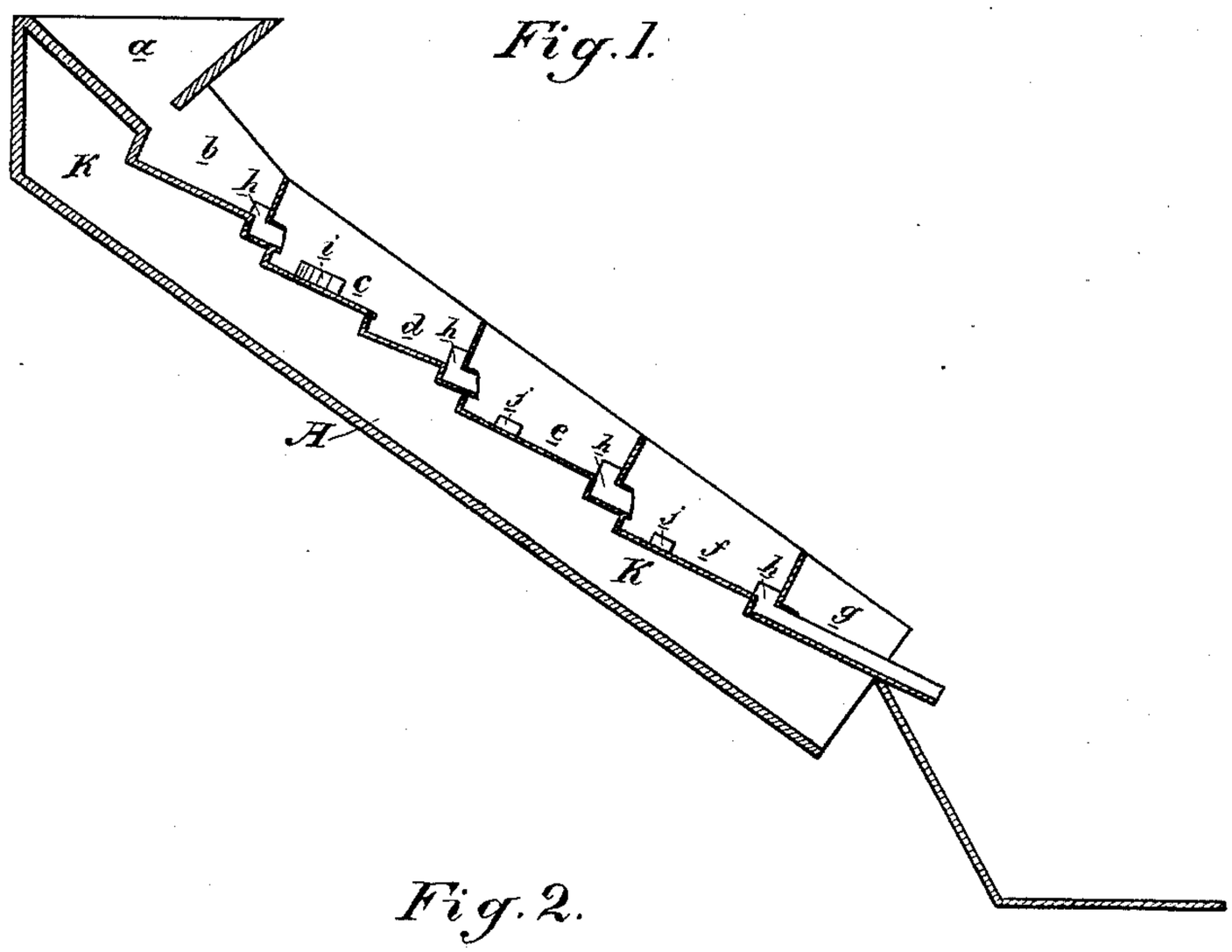
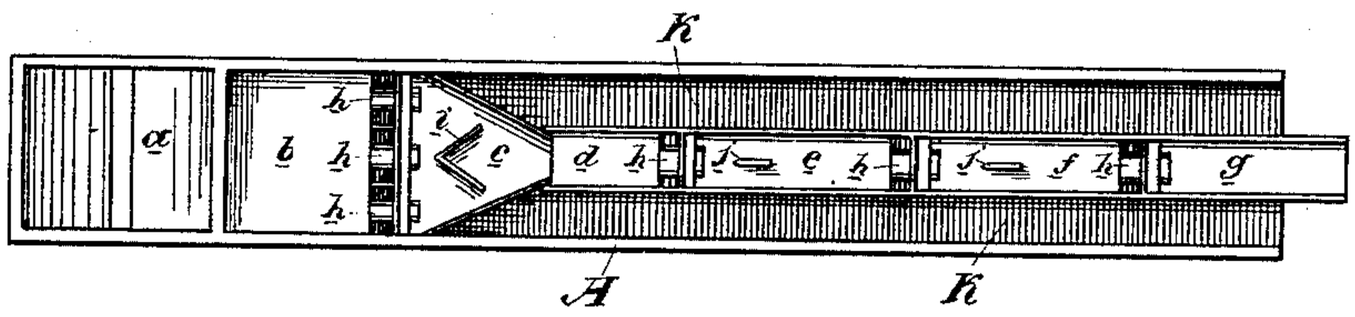


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

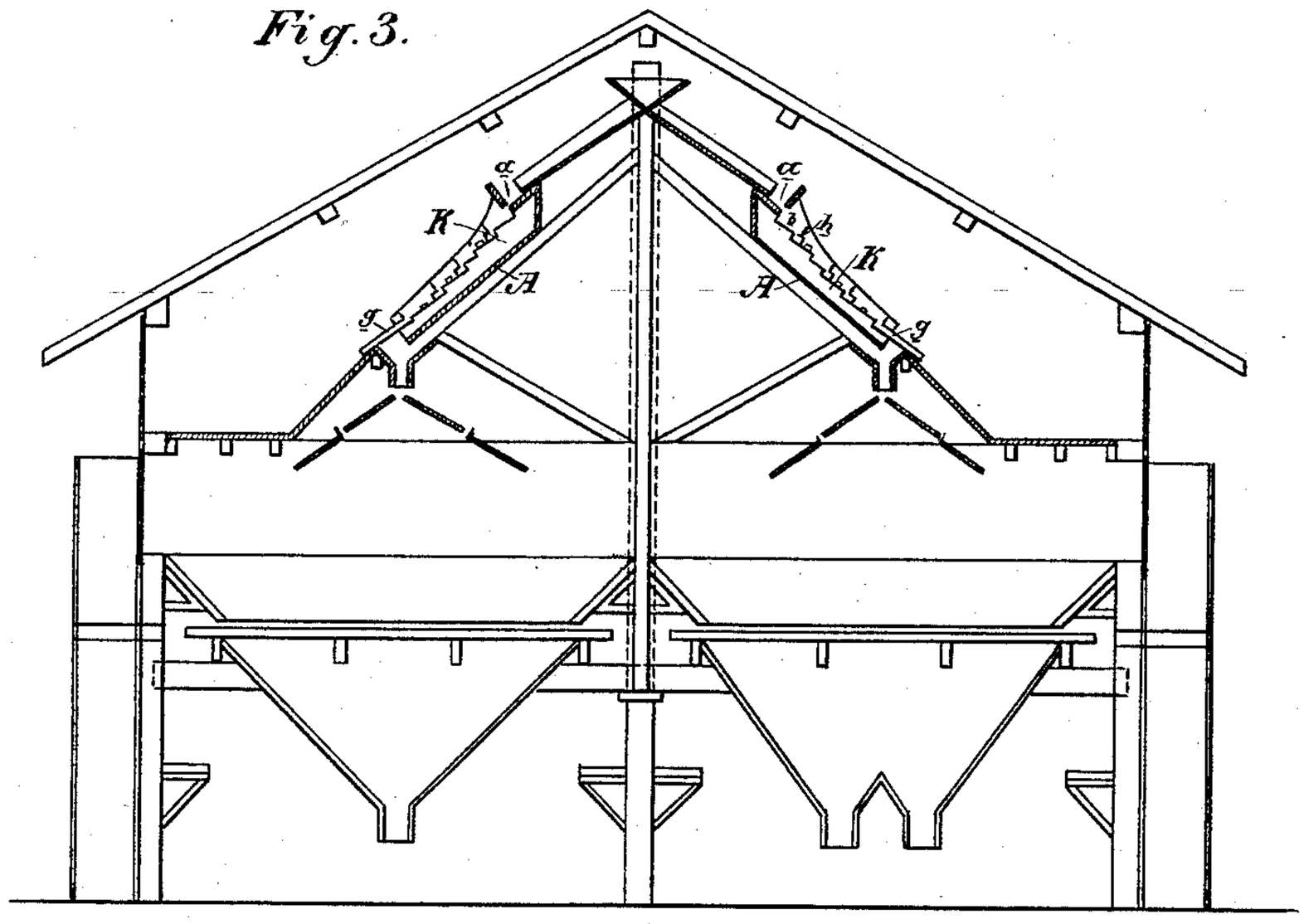
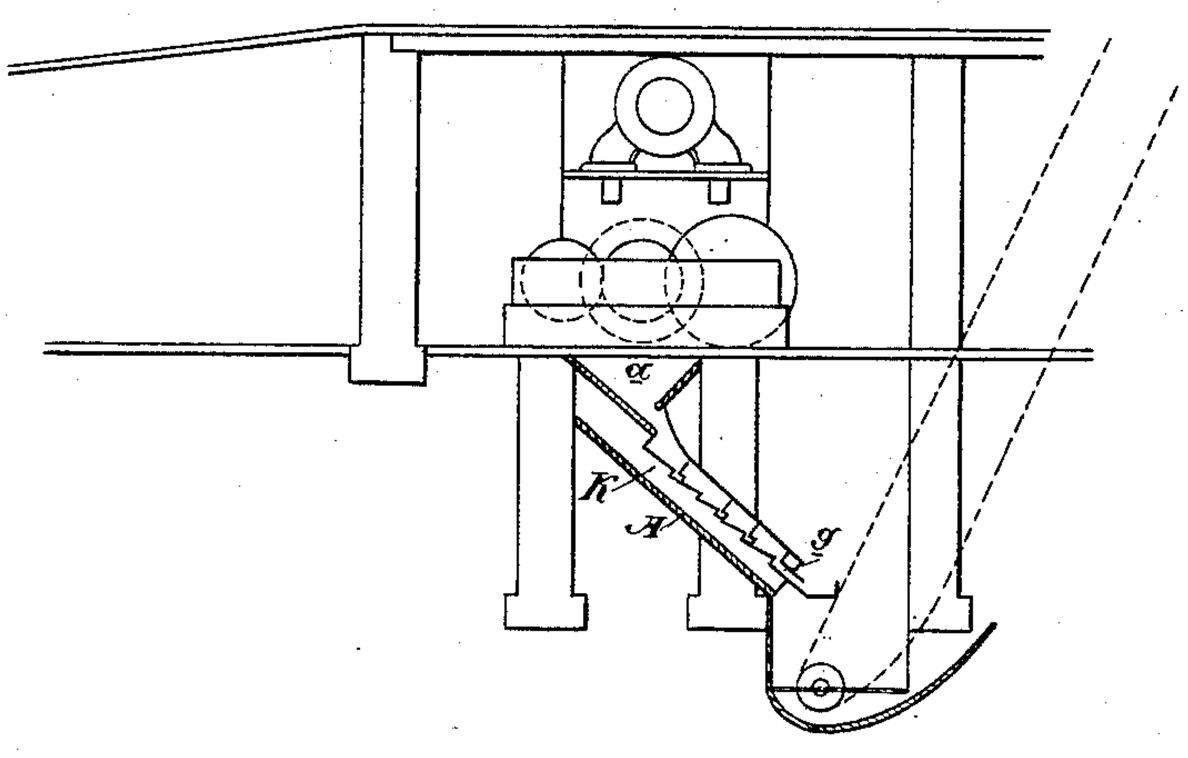


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM JONES, OF SAN FRANCISCO, CALIFORNIA.

SAMPLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 359,158, dated March 8, 1887.

Application filed May 27, 1886. Serial No. 203,484. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JONES, of the city and county of San Francisco, State of California, have invented an Improvement in Sampling Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a new and useful sampling apparatus; and it consists in the peculiar construction and combination of elements, which I shall hereinafter fully describe and claim.

The object of my invention is to provide a means whereby thoroughly reliable samples of large quantities of materials—such as grain, cement, crushed ore, rock, or other substances—can be obtained during their passage to a storing-floor or elsewhere.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a longitudinal section of my sampling apparatus. Fig. 2 is a plan of the same. Fig. 3 is a view showing its use in a structure in connection with a storage-floor to which the materials are passed. Fig. 4 shows its use in connection with a roller-mill.

A is the frame composing the body of the apparatus. This is fixed at a suitable inclination, so that the material may flow through freely and quickly, an angle of thirty-five degrees being found to answer.

In the top of the frame is formed a hopper or chute, *a*, into which the material being sampled is fed. The lower end of hopper *a* communicates with a chute, *b*, which at its lower end is subdivided into a number of equal-sized compartments or passages, *h*. These must be of sufficient width to pass the material freely. About one-third of these passages or compartments (here shown as one at the center and one near each end,) communicate directly with the succeeding chute, *c*, while the other two-thirds open directly into a continuous chute, K, formed in the bottom of the frame A and extending the entire length of said frame.

The chute *c* is made narrowing to its lower end, which communicates directly with a chute, *d*, which has only about one-third the width of chute *b*. The lower end of chute *d* is divided into separate passages, *h*, one of which is here shown as communicating with the succeeding chute, *e*, while the other two communicate directly with the underlying chute K.

The lower end of the chute *e* is also subdivided into passages *h*, one of which communicates with the succeeding chute, *f*, while the others communicate with the underlying chute K. The lower end of chute *f* is likewise subdivided and communicates with the succeeding chute, *g*, and with the underlying chute K. The lower end of the chute *g* communicates with a suitable receptacle or a platform, (shown in Fig. 3,) whereby the contents of chute *g*, which is the sample, may be secured.

The chute K directs the discharge of the main body of material to any desirable point. Within the chute *c*, about its center, is placed a V-shaped deflector, *i*, and within the succeeding chutes *e* and *f* are placed small divisional dividers *j*.

The operation of the sampling apparatus is as follows: The material to be sampled is fed into the hopper *a*, and thence passes into the chute *b*, at the lower end of which a small proportion passes directly into the chute *c*, while the larger part drops through into the underlying chute K. The center flow of the material which has passed into chute *c*, and which is now but a third of the original mass, is deflected by the plate *i* and joins with the side flow at the narrow exit of chute *c*, so that upon passing to chute *d* it is well mixed. From the lower end of chute *d* a third of the material passes into chute *e*, while the remainder falls through into K. In chute *e* the divider *j* spreads the material out, and thus mixes it. From chute *e* a portion goes to chute *f* and the rest to chute K. In chute *f* the divider again spreads and mixes it. From chute *f* a portion goes to chute *g* and the rest to chute K, and thus from chute *g* we get a small sample. The sample thus given is less than one and one-half per cent. of the whole of the material fed into the apparatus. A larger or a smaller percentage can be given, if desired, by reducing or increasing the number of separating-chutes. The dividers *j* are for the purpose of diverting and separating the flow evenly over the chutes.

Any desired number of tons daily may be thus reliably sampled, the quantity being lim-

ited only by the capacity of crusher and rolls, or by the quantity of material fed to the apparatus.

When handling Portland cement, which should be always stored for cooling and mixing before packing, this apparatus enables the whole of the material to be sampled in its course to the storage-floor, as shown in Fig. 3, and thus its strength and quality may be proved and guaranteed. Argillaceous limestone of proper composition will produce the strongest Portland cement; but the often varying compositions in the different strata or beds in the same quarries of argillaceous limestone, marl, or calcareous tufa make it sometimes difficult to produce a Portland cement of uniform quality from these materials. By the use of this sampling apparatus for the material, as it comes from the rolls its quality may be known and the required percentage of carbonate of lime or clay may be mixed in as the material passes from the storage-floor. The value and properties of any large quantities of crushed ore or other substances may be ascertained by the use of the sampling apparatus, and thus the required percentage of any substance to produce a given chemical value in the material sampled may be ascertained; or from the sample it may be determined if the mass of the material is worth working.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A sampling apparatus consisting of a series of successive inclined chutes, a continuous chute beneath said series, passages or compartments of a given capacity connecting the chutes of the series, and passages or compartments of a greater capacity connecting each chute of the series with the underlying chute, whereby but a small proportion of the material is delivered to the last of said series, substantially as herein described.

2. A sampling apparatus consisting of a series of successive inclined chutes, which series is narrower or of less capacity at the lower end than at the upper end, a continuous chute beneath said series, a passage or passages of decreasing capacity connecting the chutes of the series, and a passage or passages of greater and decreasing capacity connecting each chute of the series with the underlying chute, substantially as herein described.

3. A sampling apparatus comprising a series of successive inclined chutes, said series consisting of the wide upper chute or chutes and the narrower lower chute or chutes, a continuous chute beneath said series, and the passages *h*, connecting the chutes, as described, and reduced in number in the lower chutes of the series, substantially as herein described.

4. A sampling apparatus consisting of a series of successive inclined chutes, a continuous chute beneath said series, and passages or compartments, the lesser number connecting the chutes of the series and the greater number connecting each chute of the series with the underlying chute, whereby but a small proportion of the material is delivered in the last chute, substantially as herein described.

5. In a sampling apparatus, the frame A, having formed in its upper portion the inclined chutes *a*, *b*, *c*, *d*, *e*, *f*, and *g* of a successive series, the continuous chute K under said series, and the independent separate compartments or passages *h* at the lower end of the chutes of the series, a smaller number of said passages or compartments communicating with the successive chutes and a greater number communicating with the underlying chute, substantially as herein described.

6. In a sampling apparatus, the series of successive chutes communicating with each other through passages of given capacity, and the underlying chute X, with which each chute of the series communicates through passages of greater capacity, in combination with the spreaders or dividers *i j* in the chutes of the series, substantially as herein described.

In witness whereof I have hereunto set my hand.

WILLIAM JONES.

Witnesses:
C. D. COLE,
J. H. BLOOD.