

(No Model.)

2 Sheets—Sheet 1.

P. A. OLIVER.

AUTOMATIC FEED AND DELIVERY APPARATUS FOR GUNPOWDER MILLS.

No. 386,843.

Patented July 31, 1888.

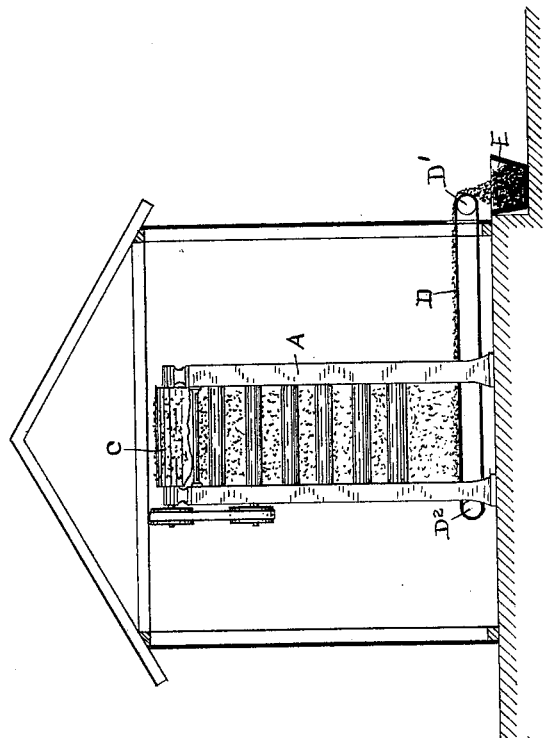


Fig. 1

WITNESSES:

Geo. Guntz
W. D. Porter

INVENTOR

Paul A. Oliver.

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Herbert W. F. Jenner.

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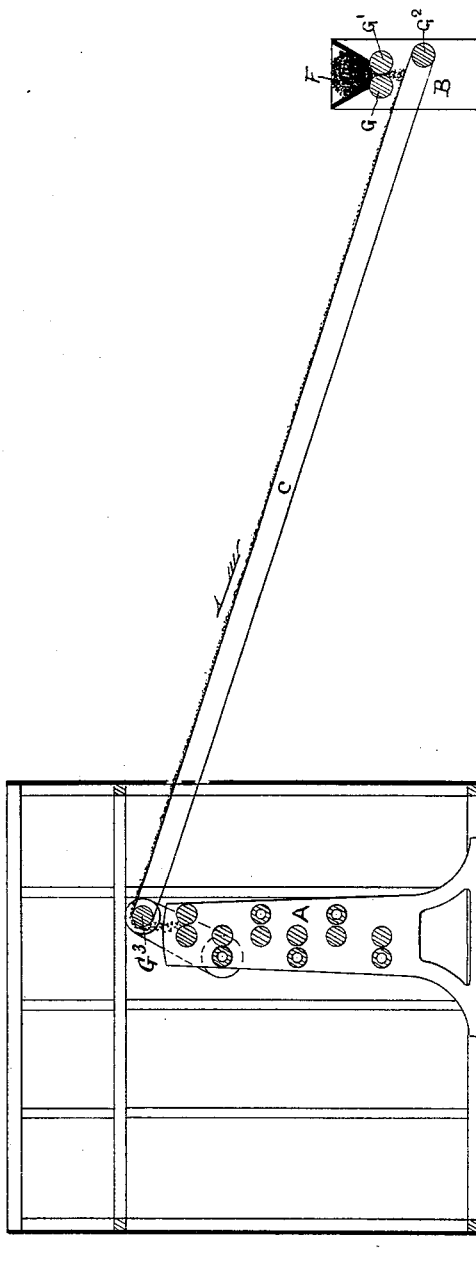


Fig. 2

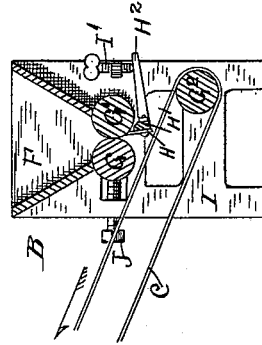


Fig. 4

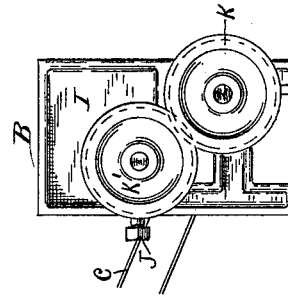


Fig. 5

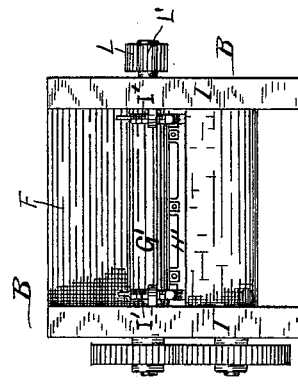


Fig. 3

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UNITED STATES PATENT OFFICE.

PAUL AMBROSE OLIVER, OF OLIVER'S MILLS, PENNSYLVANIA.

AUTOMATIC FEED AND DELIVERY APPARATUS FOR GUNPOWDER-MILLS.

SPECIFICATION forming part of Letters Patent No. 386,843, dated July 31, 1888.

Application filed June 14, 1887. Serial No. 241,268. (No model.)

To all whom it may concern:

Be it known that I, PAUL AMBROSE OLIVER, a citizen of the United States, residing at Oliver's Mills, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Feed and Delivery Apparatus for Gunpowder-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for automatically feeding material to and delivering ground powder from a gunpowder-mill.

This invention consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a side elevation of the delivery apparatus, showing an end view of portions of the mill. Fig. 2 is a side view of the feeding apparatus, showing portions of the distributor in longitudinal section, and a side view of portions of the mill. Fig. 3 is a front elevation of the distributor. Fig. 4 is a longitudinal section through the distributor, and Fig. 5 is a side elevation of the same.

A is the powder-mill, which is fully described in a separate application for Letters Patent filed of even date herewith, Serial No. 241,269, June 14, 1887. This mill is inclosed in a house or shed, as shown in section in the drawings. Additional shelters may also be advantageously provided over the other portions of the apparatus.

F is the feed-hopper of the distributor, into which the roughly-pulverized sulphur, saltpeter, and charcoal are placed.

E is a hopper for receiving the ground powder from the mill. Both hoppers E and F are placed at a distance from the mill, and the material is conveyed in small quantities from the feed-hopper to the mill and from the mill to the delivery-hopper by means of automatic machinery, hereinafter fully described, so that only a very small portion of the material is being operated on at one time, and so that no one is obliged to go near the mill or into the building containing it while it is in operation.

Should the small quantity of material being operated upon in the mill explode, the contents

of the hoppers will not be ignited thereby, as the hoppers are located at too great a distance from the mill for direct ignition, and the thin streams of material will be blown off the surface of the conveyers by the force of the explosion before the fire has time to pass down them to the hoppers.

The ground powder is conveyed from the mill upon the surface of the traveling belt D, which passes over rollers D' D², of which roller D² is driven from one of the shafts of the mill.

B is the distributor, provided with the side frames, I, between which the feed-hopper F is secured.

G G' are the rolls which distribute the material evenly upon one end of the belt C, which passes over the roller G² and conveys the material to the mill.

The roller G³ at the other end of the traveling belt is driven from the mill, and the said belt C communicates the motion of it to the roller G².

K is a toothed wheel secured upon the spindle of roller G², which gears into a similar toothed wheel, K', upon the spindle of the distributing-roll G. This insures a positive connection between the distributor and the conveyer and prevents any inequality or unevenness in the feed. The distributing-roll G' has a small toothed wheel, L', secured upon the end of its spindle, which wheel gears into a larger toothed wheel, L, upon the spindle of the roll G, so that the roll G' is driven at about twice the speed of roll G. The roll G is made to slide in the frames, and J are adjusting-screws for setting it up against the roll G', leaving only a small opening between the two rolls.

The roll G' is provided with a scraper, H, bolted to a cross-bar, H', which is pivoted in the side frames. H² are arms projecting from the cross-bar H' on the opposite side from the scraper, and I' are thumb screws working in lugs projecting from the side frames and pressing upon the ends of arms H². These thumb-screws are used to set up the scraper against the roll as it wears away. The roll G does not require a scraper, as the faster movement of roll G' keeps it rubbed clean.

What I claim is--

1. The combination of the supply-hopper F for the unground explosive materials, the con-

veyer C, the gunpowder-grinding mill A, fed uniformly by the said conveyer, the conveyer D, driving-wheels connecting the said conveyers with the revolving mechanism of the mill, 5 and the discharge-hopper E, the said mill being located at such distances from the supply and discharge hoppers that the explosion of the small quantity of material in the mill will not be communicated to the contents of the 10 hoppers.

2. The combination of the supply-hopper F for the unground explosive materials, the distributor B, provided with revolving rolls, the conveyer C, driving-wheels connecting the conveyer with the revolving mechanism of the mill, the toothed wheels positively connecting the conveyer with the distributor-rolls, and 15 the gunpowder-grinding mill A, fed uniformly

by the said conveyer and located at such a distance from the supply-hopper that the explosion of the material in the mill will not be communicated to the contents of the hopper. 20

3. The combination, with a gunpowder-mill, of a traveling belt driven from the mill for conveying the inflammable material to the 25 mill, a feed-hopper for the material, and a pair of revolving rolls journaled below the feed-hopper for distributing the material evenly upon the belt.

In testimony whereof I affix my signature in 30 presence of two witnesses.

PAUL AMBROSE OLIVER.

Witnesses:

CHAS. P. HUNT,
GEO. GUNTZ.