(No Model.)

W. B. FARWELL.

DRY ORE CONCENTRATOR.

No. 278,325. Patented May 29, 1883.

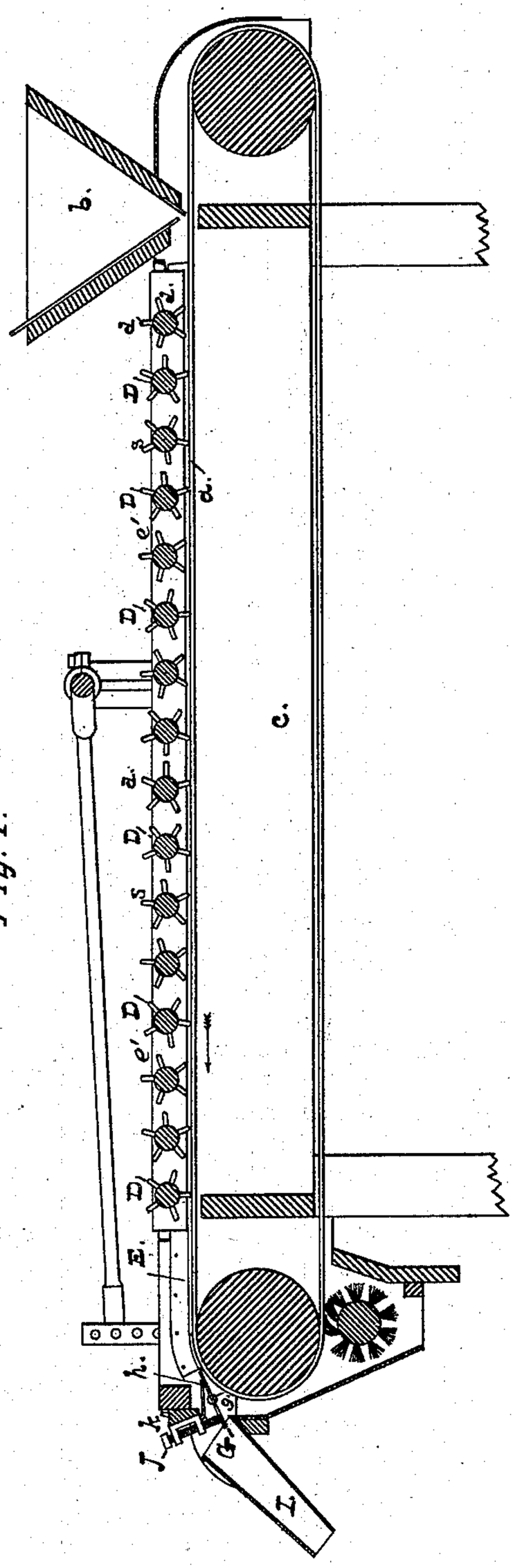

Fig. 1.

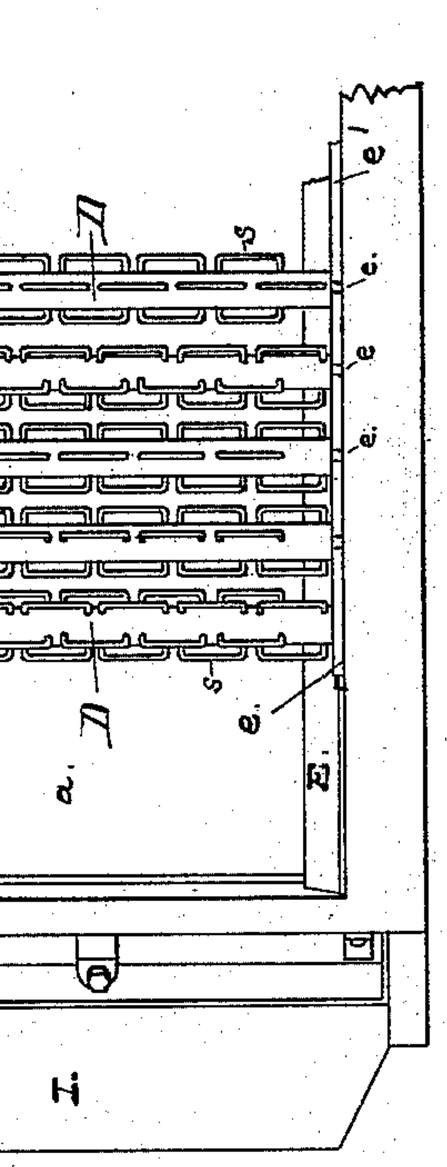

Fig. 2.

Fig. 4.

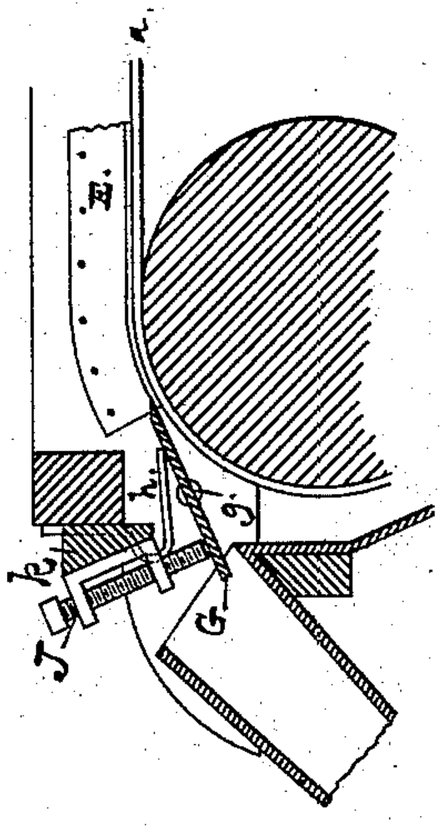

Fig. 3.

Witnesses:
Wm Voit
Geo. Vincent

Inventor:
Willard B. Farwell
By his Atty., Edm. J. Adams

UNITED STATES PATENT OFFICE.

WILLARD B. FARWELL, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF FIVE-EIGHTHS TO JOHN LANDERS AND I. M. TAYLOR, OF SAME PLACE.

DRY-ORE CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 278,325, dated May 29, 1883.

Application filed July 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLARD B. FARWELL, a citizen of the United States, at present sojourning in San Francisco, county of San Francisco, and State of California, have made and invented certain new and useful Improvements in Dry-Ore Concentrators; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

My invention relates to certain improvements in ore-concentrating machines of the kind known as "dry-ore concentrators," the ore being spread upon a perforate belt or surface having horizontal progressive motion over a blast or current of air directed upward against the under side of the surface and through the perforations thereof, whereby stratification of the particles according to their specific gravity is effected.

The following description explains the nature of my several improvements and the manner in which I construct, apply, and combine them together with the other parts of a machine or apparatus.

In the drawings herein referred to, Figure 1 is a vertical longitudinal section through the upper portion of a machine-frame, the traveling belt and its driving-rolls, showing my improvements applied thereto. Fig. 2 is a top view of several of the holding-down rollers at and near the discharge end of the machine. Figs. 3 and 4 are details of the yielding cut-off plate.

The bed *a* has motion in one direction from the hopper *b* to the discharge end or tail of the machine, passing over the open top of the air-chamber *c*, and receiving from the bellows or other air-forcing apparatus therein successive blasts or strong impulses of air against its under surface. To counteract this pressure against the under side and the tendency of the bed to yield and rise with it, I place across the bed, at intervals apart, and over the working portion of its surface, a number of trundle-bars, D D, having spurs or spoke-like projections *d d*, and centered upon pintles *e e*, having bearings in the side frames, so as to revolve freely. Said bars are set at such distance above the bed that the projections *d d* touch or run in close proximity to its surface when it is in horizontal position, and, being loosely pivoted in the side frame, said bars are free to turn as the bed moves along beneath them. Sufficient space between the surface of the bed and the bottoms of the trundle-bars is afforded for the body of ore to move beneath and clear of them; but the projections *d d* dip into and penetrate through the ore matter to the surface of the bed. In the construction here given the projections *s* on the bars D are formed of a number of wire loops or staples of rectangular shape, with their ends let into the body of the bars, and having sufficient projection therefrom to touch the ore-bed or run in close proximity thereto when the bars rotate. Being thus open, and presenting small surfaces to engage with the ore matter, they take into and pass out from it without disturbing the uniformity of the layer or throwing off its particles. These projections are to be preferred in place of simple spokes, pins, or other devices presenting ends or points, as the bed is prevented from catching upon and being torn or injured by such projections in this traveling movement. In practice I support these trundle-bars in separate side rails, *e' e'*, so that they can be readily lifted out and removed from the bed. This is shown in Figs. 1 and 2, where these side rails are simply set in the frame against cleats or projections placed at either end of the said rails on the main frame. The rollers keep them in place laterally.

Over and along the sides of the bed I place flaps E to close the spaces between the sides of the bed and the side fames. These flaps are made of some flexible material—such as rubber—and are fastened to the side frames along the inside. They are wide enough to lap upon portions of the bed-surface beyond the sides. The lapped portion of each is made to lie flat upon the bed-surface, and closely enough to prevent the particles of sand or ore from working in between the surfaces and escaping into the bellows-chamber beneath.

The cut-off plate G, by which the two strata of material under treatment are separated and directed each into its proper receptacle, is of novel construction and operation. It is adjustable, and also self-yielding, in its action.

The cut-off plate G consists of a blade placed at the discharge end of the bed, and having an inclined position, or one tangent to the curved surface of the bed where it leaves the horizontal and begins to turn over the drum or roller. It has a beveled front edge, and extends across the bed the full width of its working-surface. Its upper surface, being inclined toward the discharge, receives and directs all that portion of ore matter composing the top stratum into the chute I, while the space left between this front edge and the surface of the bed affords outlet for the lowest stratum resting on the moving surface.

To change the height of the plate G it is centered on pivots *g g* in the side frames, and a set-screw, J, held in a bracket, *k*, bears upon the rear end. By turning this screw the position of the edge *g'* of the plate is readily adjusted. A spring, *h*, of suitable strength, is bolted at one end to the cross-timber of the frame to press against the front end of the plate, and thus keep the rear end in contact with the end of the set-screw. This construction likewise gives a self-yielding capacity to the cut-off plate, by which its front edge will rise and permit any small obstructions—such as lumps or large particles of ore—to pass beneath it through the outlet below the edge *g'*. The discharge cannot clog or choke, and is therefore kept free and clear.

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

1. In a dry-ore concentrator, the combination, with a traveling belt, of mechanism distributed at various points along the length of the said belt for the purpose of holding it down against the action of an air-blast from beneath, as set forth.

2. The combination, with the traveling ore-supporting surface in a dry-ore concentrator, of the trundle-bars D, constructed and applied to operate substantially as described.

3. In a dry-ore concentrator, the combination, with the ore-supporting surface, of the adjustable inclined pivoted cut-off plate G, the adjusting means placed on one side of the center pivot, and the yielding means placed upon the other side thereof, whereby a capacity for yielding when the character of the progressing ore makes it necessary is imparted to the plate G, substantially as herein set forth.

4. The combination of the plate G, pivoted at its center, *g*, with the spring *h*, placed above said plate and in front of the pivot, and the adjusting-screw J, placed above the plate and bearing upon it back of the pivot, whereby the plate is kept taut against the screw, unless the force of the spring is overcome by the progressing ore, as set forth.

Witness my hand and seal.

WILLARD B. FARWELL. [L. S.]

Witnesses:

EDWARD E. OSBORN,

GEO. VINCENT.