(No Model.)

W. D. SMITH.

Amalgamator.

No. 236,100. Patented Dec. 28, 1880.

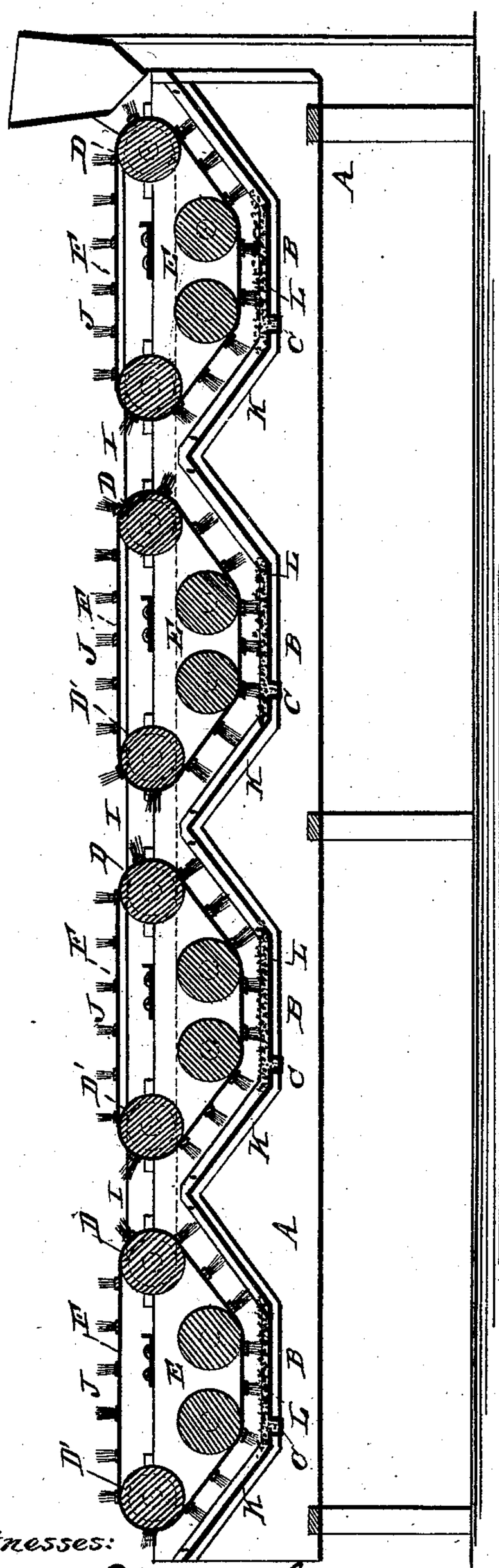

Fig. 1.

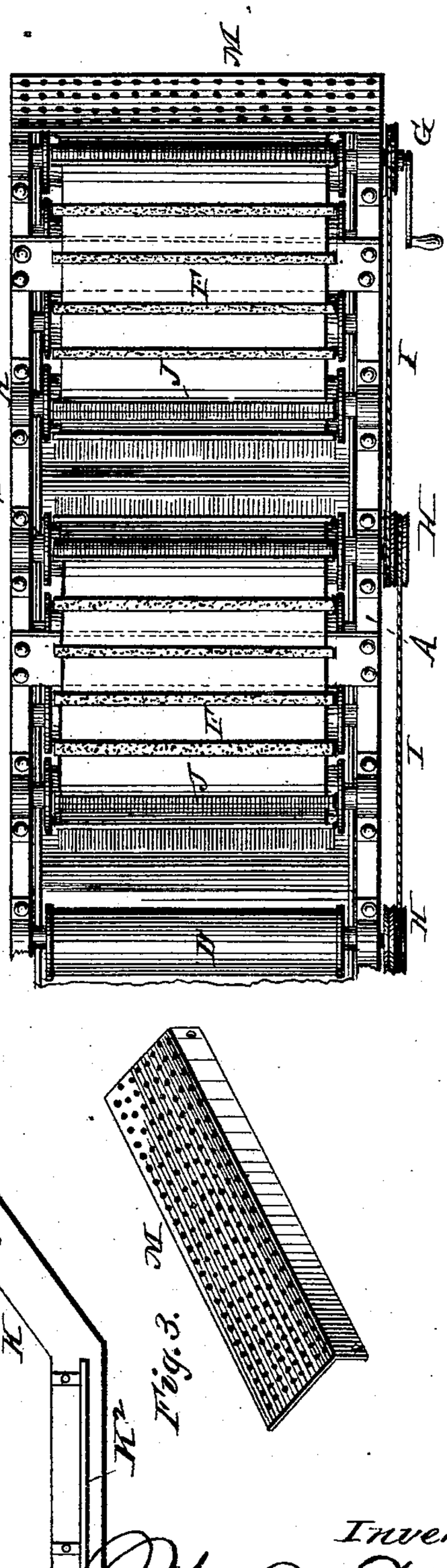

Fig. 4.

Fig. 3.

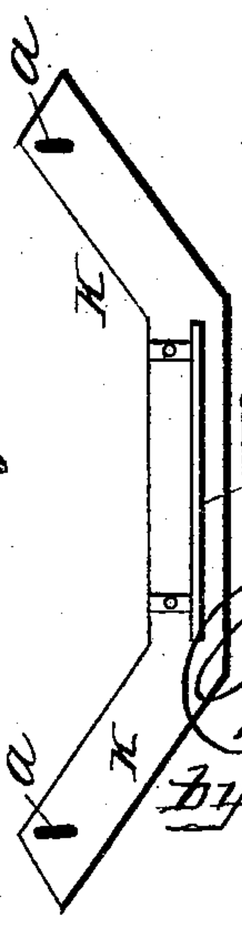

Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

WALTON D. SMITH, OF PROPHETSTOWN, ILLINOIS, ASSIGNOR OF ONE-HALF TO GEORGE SEYLLER, OF SAME PLACE.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 236,100, dated December 28, 1880.

Application filed May 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, WALTON DUANE SMITH, of Prophetstown, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Amalgamators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Figure 1 is a vertical longitudinal sectional view of a machine embodying the improvements in my invention, in which a series of four pans and four sets of brushes are shown. Fig. 2 is a detail view of the adjustable bar for preventing the sagging of the brush-carrying belts. Fig. 3 is a detail view of the screen or sieve through which the gold-bearing dirt is fed to the machine, and Fig. 4 is a plan view of the machine.

The invention relates to amalgamators; and it consists in the improvements hereinafter fully described, and particularly pointed out in the claims.

Referring by letter to the drawings, A designates the frame of the machine; B, the mercury-pans provided with the troughs C, and D D′ E the rollers over which the endless belts F pass. The roller D of the first series of rollers is provided at one end with a pulley, G, and the rollers D′ of the succeeding sets have double pulleys H, in order that the several sets of rollers D D′ E may be connected by the bands or belts I. The endless belts F are provided with brushes J, traversing the same from edge to edge, the slats by which said brushes are secured thereto projecting slightly beyond the edges of the belt F, in order that the projecting ends may travel upon the inward-projecting flanges K^2 on bars K, said flanges supporting the said projecting ends of the brush-slats, thus supporting the latter, and thereby preventing the endless belt from sagging while the brushes are passing over the mercury. Bars K are adjustable upon the inner sides of the mercury-pans by means of set-screws working in vertical slots *a* in the said bars; or they may be adjusted by any other suitable and effectual means.

The mercury-pans may be made of wood or iron. I, however, prefer cast-iron. The brushes J may be made of any suitable material. I prefer to employ tufts of steel wire in their construction. The mercury-pans B may be made removable from the frame in order to gain access to them; or the rollers and brushes may be made removable in order to accomplish the same object. In fact, various methods of constructing these portions of the machine, in order to gain access to the mercury-pans for the purpose of separating the gold from the mercury, may be practiced without departing from this portion of the invention.

L designates the mercury in the bottoms of the pans, and M represents the screen, through which the gold-bearing dirt is fed in a thin stream to the machine. The gold-bearing dirt is first pulverized by any suitable means to break up the lumps, &c., and then dried, and when in this dry state is fed through the screen M at the head of the machine to the first pan, B. The machine should, of course, be level, so as to present a level surface of mercury to the brushes, so that the latter will just dip slightly into the mercury. The machine is then set in motion by hand or other suitable power. The brushes carry the dirt over the mercury in the first pan, and the mercury catches whatever gold comes in contact with it, and as the gold is heavier than the mercury the agitation of the mercury, caused by the motion of the brushes, tends to sink the gold to the bottom, or at least so low as to prevent it from being carried over by the brushes. If, however, some minute particles of the mercury should get up into the lighter dirt, they will be carried over the rear of the first pan, but will be most likely caught in the next one. The only reason that any mercury will be carried over to the next pan is that some minute particle of the mercury may amalgamate with small particle of gold in the dirt and be brushed over. Practically all, or nearly all, of the gold will be brought in contact with the mercury before the dirt is swept out of the last pan, and the dirt itself will not carry over any mercury from the last pan. The mercury in the pans should be from a quarter to a half an inch in depth. Should there be any nuggets of gold in the dirt they will be swept

along by the brushes until they reach the troughs in the bottoms of the pans, where they will sink below the action of the brushes.

The process hereinbefore described of passing gold-bearing dirt in a dry state over a body of mercury by means of brushes, sweeps, or scrapers dispenses entirely with washing in placer diggings, where very frequently water is scarce and expensive.

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

1. In an amalgamator, the combination, with the series of mercury-pans B, of the rollers D D′ E and endless belts F, carrying the brushes J, substantially as and for the purposes set forth.

2. In an amalgamator, the combination, with the endless belt F, carrying the brushes J, of the mercury-pan B, provided with the trough C, and the rollers D D′ E, substantially as and for the purposes set forth.

3. In an amalgamator, the combination, with the endless belt F, carrying the brushes J, secured thereto by slats, the ends of which project beyond the edges of the belt F, of the mercury-pan B, provided with the vertically-adjustable bars K, having inwardly-projecting flanges K^2, and the rollers D D′ E, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WALTON DUANE SMITH.

Witnesses:

JAS. SCARRITT, Jr.,

GEO. E. PADDOCK.