

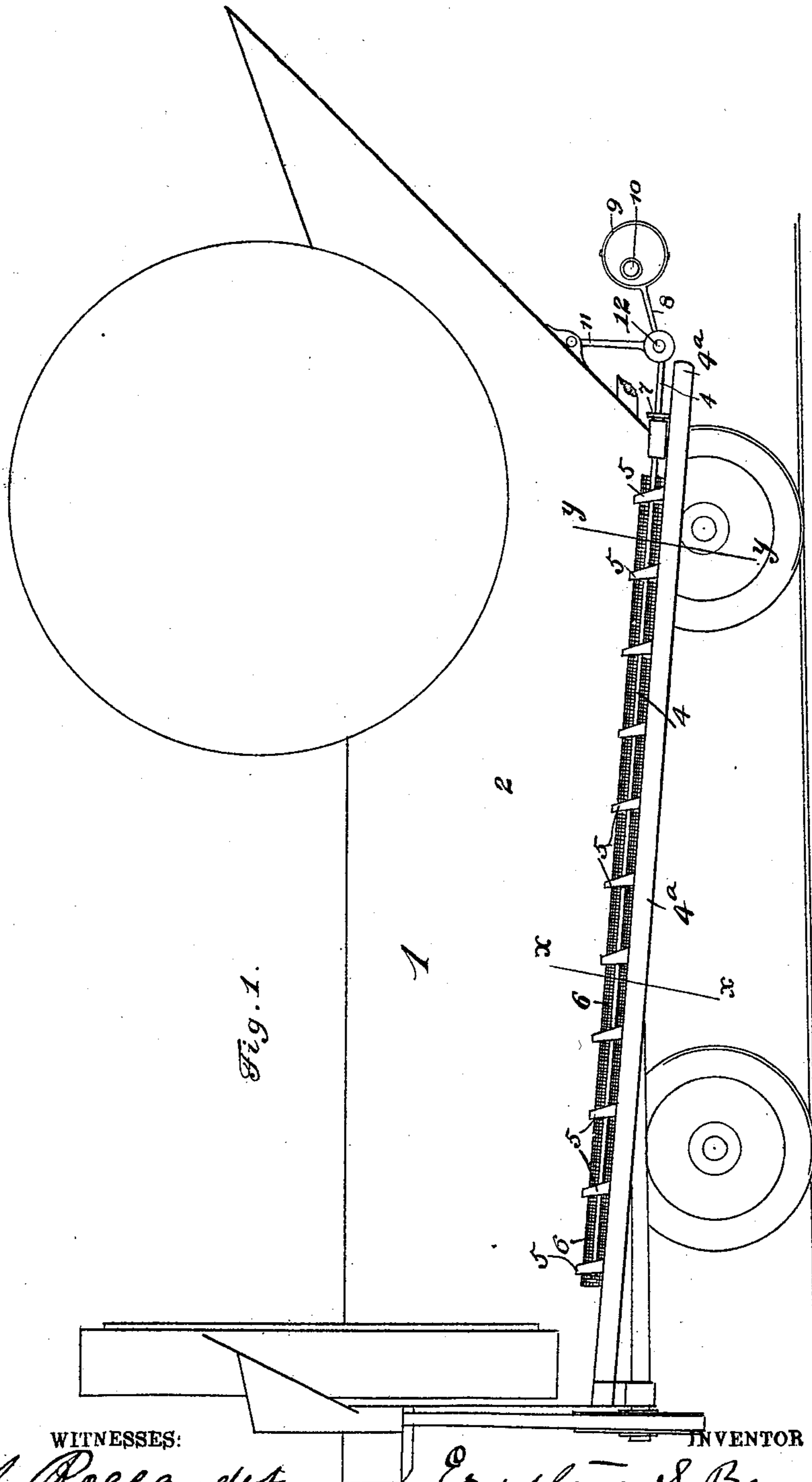
(No Model.)

2 Sheets—Sheet 1.

**E. S. BENNETT.**  
**AMALGAMATOR.**

No. 516,623.

Patented Mar. 13, 1894.



WITNESSES:

G. J. Roelandt  
Wm M Connell

INVENTOR

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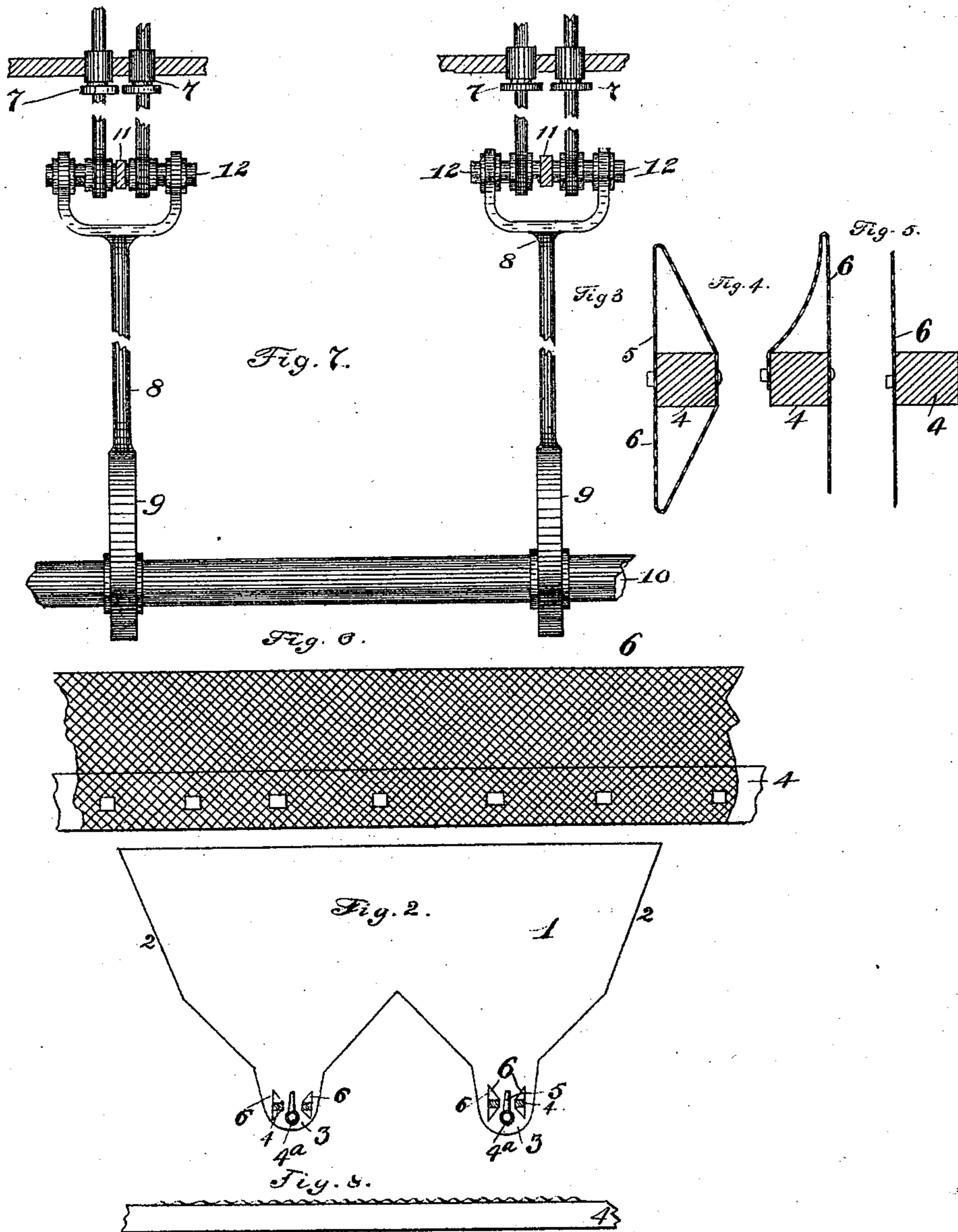
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WITNESSES:

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INVENTOR

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# UNITED STATES PATENT OFFICE.

ERASTUS S. BENNETT, OF DENVER, COLORADO.

## AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 516,623, dated March 13, 1894.

Application filed November 18, 1889. Renewed March 22, 1892. Again renewed August 14, 1893. Serial No. 483,153.  
(No model.)

*To all whom it may concern:*

Be it known that I, ERASTUS S. BENNETT, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Amalgamators; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in amalgamators and it consists in the features, arrangements and combinations hereinafter described and claimed.

In the drawings is illustrated an embodiment of my invention in which—

Figure 1 is an outline elevation of a complete machine provided with my improvement. Fig. 2 is a rear end outline showing the improvement in cross section. Figs. 3, 4 and 5 indicate suitable forms in which the fabric may be placed upon the rods, the section being taken on line  $x-x$ , of Fig. 1. Fig. 6 is an enlarged detail shown in side elevation. Fig. 7 is a plan view of the propelling mechanism. Fig. 8 is a top view of a modified form of my improvement.

In the drawings is illustrated an amalgamating tank 1 provided with inclined or sloping sides 2 and longitudinal valleys or troughs 3 having a gradual inclination from the rear of the tank to the front end thereof. Within each of these valleys and extending the entire length thereof is a water pipe 4<sup>a</sup>, provided at intervals with upwardly projecting jets or nozzles 5. In a tank of this contour there is a constant tendency on the part of the sand, mercury and unsaved mineral, to settle in these troughs or valleys and pack therein. The water jets 5 overcome this tendency to some extent, still in spite of these jets some sand and mercury, both clear and as a gold amalgam finally settle in troughs 3, the space in which, below the jet outlets, naturally forms a quiet settling chamber or pool, the mercury or amalgam settling to the bottom thereof while the lighter sand settles on top of the mercury tending normally to form small elevations or hillocks therein be-

tween the jet outlets. To prevent this and give opportunity for the mineral to work through the sand to the mercury and for the mercury to work to the lower ends of the troughs, I have devised the mechanism shown in the drawings and for which I now make application for Letters Patent. Within each valley 3 are placed two rods or bars 4 of any desired contour in cross section, the same being shown in the drawings as square or rectangular. These rods extend the entire length, or nearly the entire length of the bottom of the tank or throughout the length of the valleys or troughs, space being of course left to allow said rods a suitable reciprocating movement. To each of these rods is secured a strip or covering 6 of some thin material having an irregular surface preferably wire cloth, or corrugated sheet metal as seen in Fig. 8. This strip or covering 6 may be secured to the rods in any suitable manner as by the use of bolts, as shown, and in any desired form when seen in cross section. Suitable forms or shapes in which the fabric may be placed upon the rods are illustrated in Figs. 3, 4 and 5, it being necessary that the fabric should be continuous or approximately continuous upon the rods longitudinally, and that it should have a sufficient vertical extension to reach from above the top of the jet nozzles to the bottom of the valley directly beneath or in close proximity thereto, sufficient space being of course left to allow the fabric to clear the tank. The fabric may extend both above and below the rods 4, as shown in Figs. 3, 4 and 5, or entirely above the same as shown in Fig. 6, depending upon the height of supporting the rods above the bottom of the valley.

The central position of the rods with reference to the fabric as shown in Figs. 3, 4 and 5 is probably preferable under ordinary circumstances. The rods to which the fabric is secured are suitably supported within the valleys, and pass out of the tank through suitable stuffing boxes 7 and extend to the inner extremity of a pitman rod 8, where they are hinged, the outer extremity of the pitman being secured to an eccentric 9 operated by a shaft 10 to which power may be communicated from any suitable motor.

The forked extremity of the pitman hinged

to rods 4 is supported by a suitable hanger 11 hinged to the tank at one extremity and hinged at the opposite extremity to the connecting pin 12 which secures rods 4 to the pitman. By this means a reciprocating movement is imparted to rods 4. This movement of the rods carrying the fabric 5 will maintain a vertical passage way or crevice through the material in the bottom of the valleys and throughout the entire length thereof, thereby permitting the mercury or amalgam or mineral which may escape from the plates on the inclined sides of the tank, to pass to the bottom of the valleys and thence down the incline of said bottom to the front end of the machine where it is drawn off through a suitable cock or escape pipe. Moreover heretofore the suction of the water discharged from the jet nozzles has formed a partial vacuum in the valleys or troughs whereby the water after passing upward returns again and joins the issuing jet, but in the rear of the nozzle from which it originally issued. By this means the mercury and amalgam escaping from the sides of the tank have been taken up by the water and kept whirling toward the tail end of the machine until they are carried thereto and discharged therefrom with the tailings. The fabric upon rods 4 extending above the top of the nozzles breaks the continuity of this circular column of water, destroys, breaks or diminishes the partial vacuum within the troughs, catches the mercury, amalgam and mineral carried in suspension by the force or current of water, and the same passes at once through the crevice, kept open to the bottom of the troughs or valleys whence they pass down the incline of the tank's bottom and are drawn off as before stated.

Applicant is aware that agitators consist-

ing of reciprocating rods provided with vertical fingers at intervals thereon, have been used in amalgamators. The result of these fingers is to form short openings or cells in the sand, wherein the mercury or amalgam is caught, retained and ground up or "floured" by the continual action of the fingers thereon within said formed receptacles or openings. Hence I do not claim reciprocating agitators broadly in this class of machines, but

What I do claim is—

1. The combination with an amalgamating tank having one or more longitudinal troughs at its bottom, of the reciprocating rods 4 located longitudinally in said troughs and provided with strips of suitable material having an irregular surface, said material being continuous or approximately continuous and suitable mechanism whereby a reciprocating motion may be given to the rods substantially as specified.

2. The combination with an amalgamating tank having inclined sides terminating in one or more longitudinal valleys or troughs, and water pipes provided with upwardly projecting nozzles, of rods adapted to reciprocate and provided with a strip or cover of thin material having an irregular surface, preferably wire cloth, said material being continuous or approximately continuous upon the rods longitudinally, and having a suitable vertical extension, and means for reciprocating said rods, substantially as set forth.

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

ERASTUS S. BENNETT.

Witnesses:

JULIUS BROWN,  
A. M. SOUTHARD.