

(Model.)

W. & H. R. HAWKINS.

2 Sheets—Sheet 1.

AMALGAMATOR.

No. 281,060.

Patented July 10, 1883.

Fig. 1

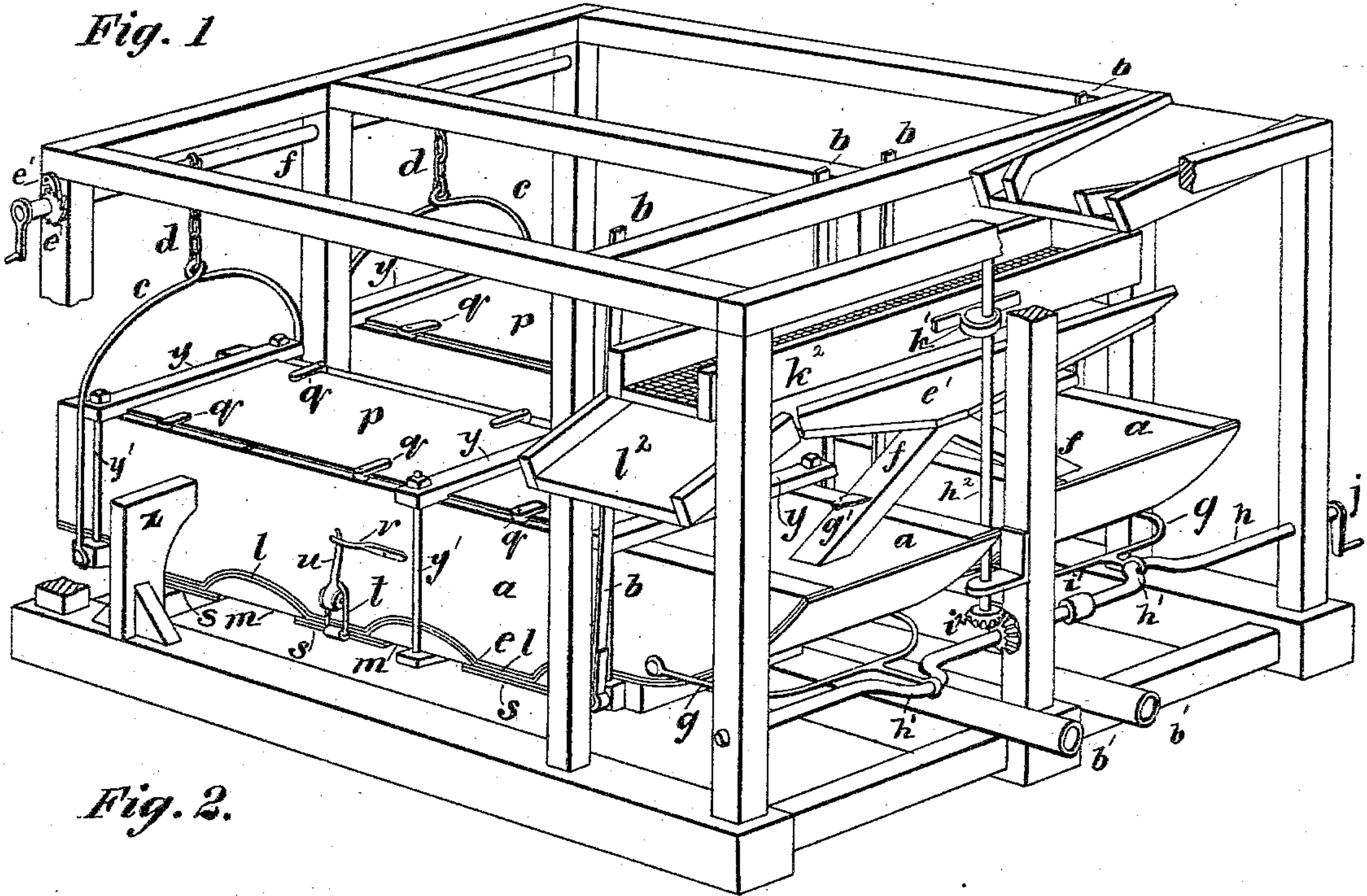
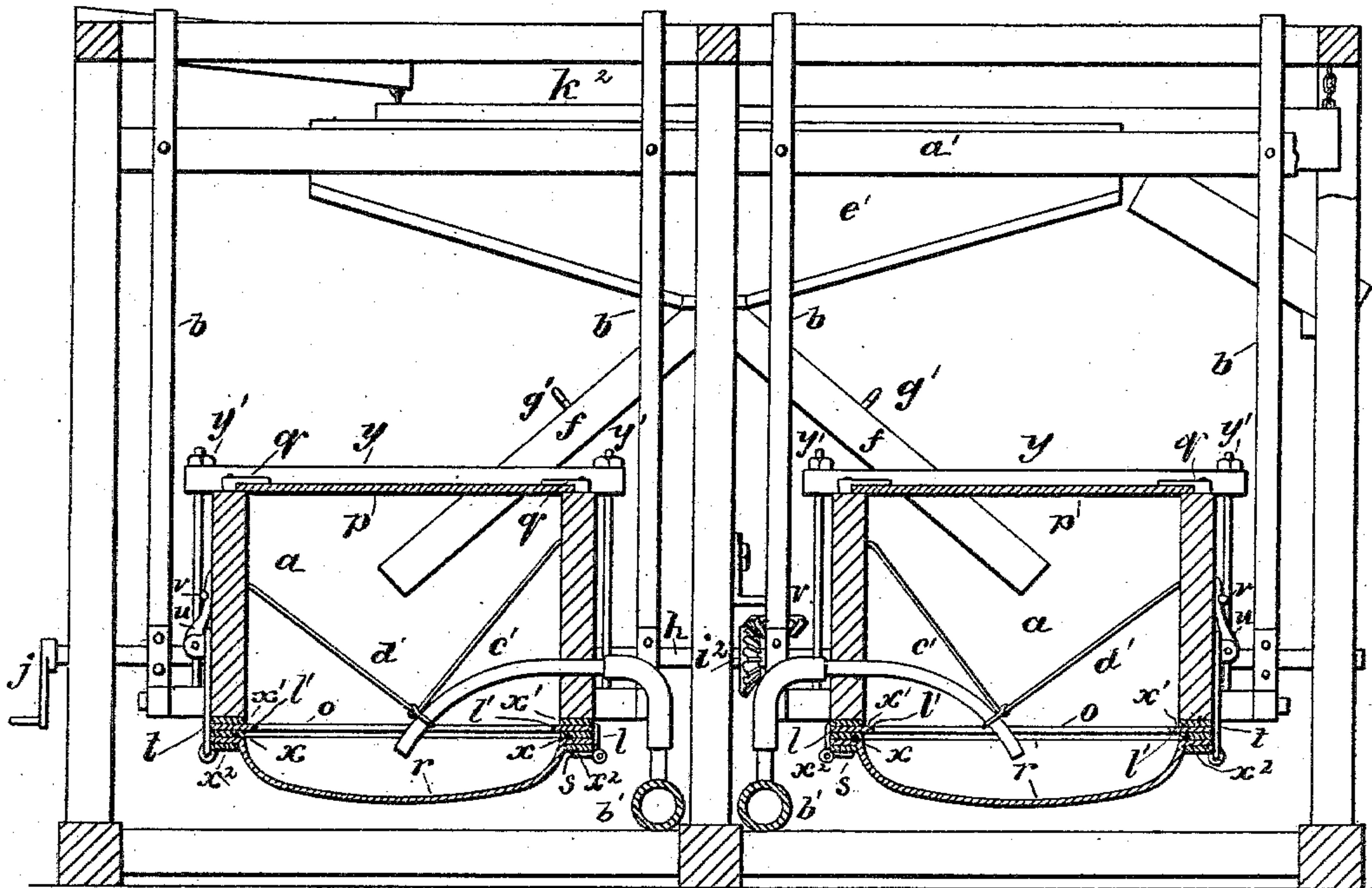


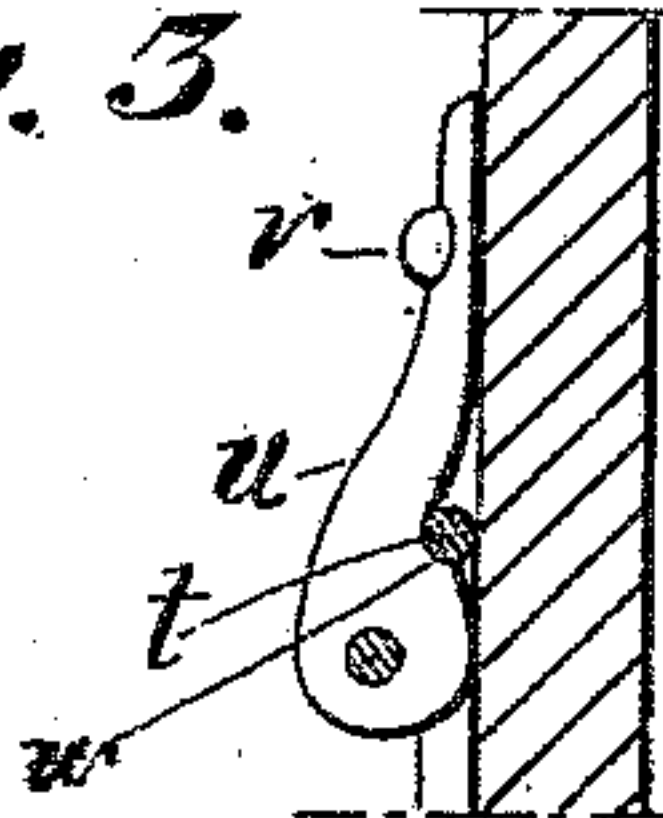
Fig. 2.



WITNESSES:

John H. Deemer
C. Sedgwick

Fig. 3.



INVENTOR:

W. Hawkins
H. R. Hawkins

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ATTORNEYS.

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Fig. 4.

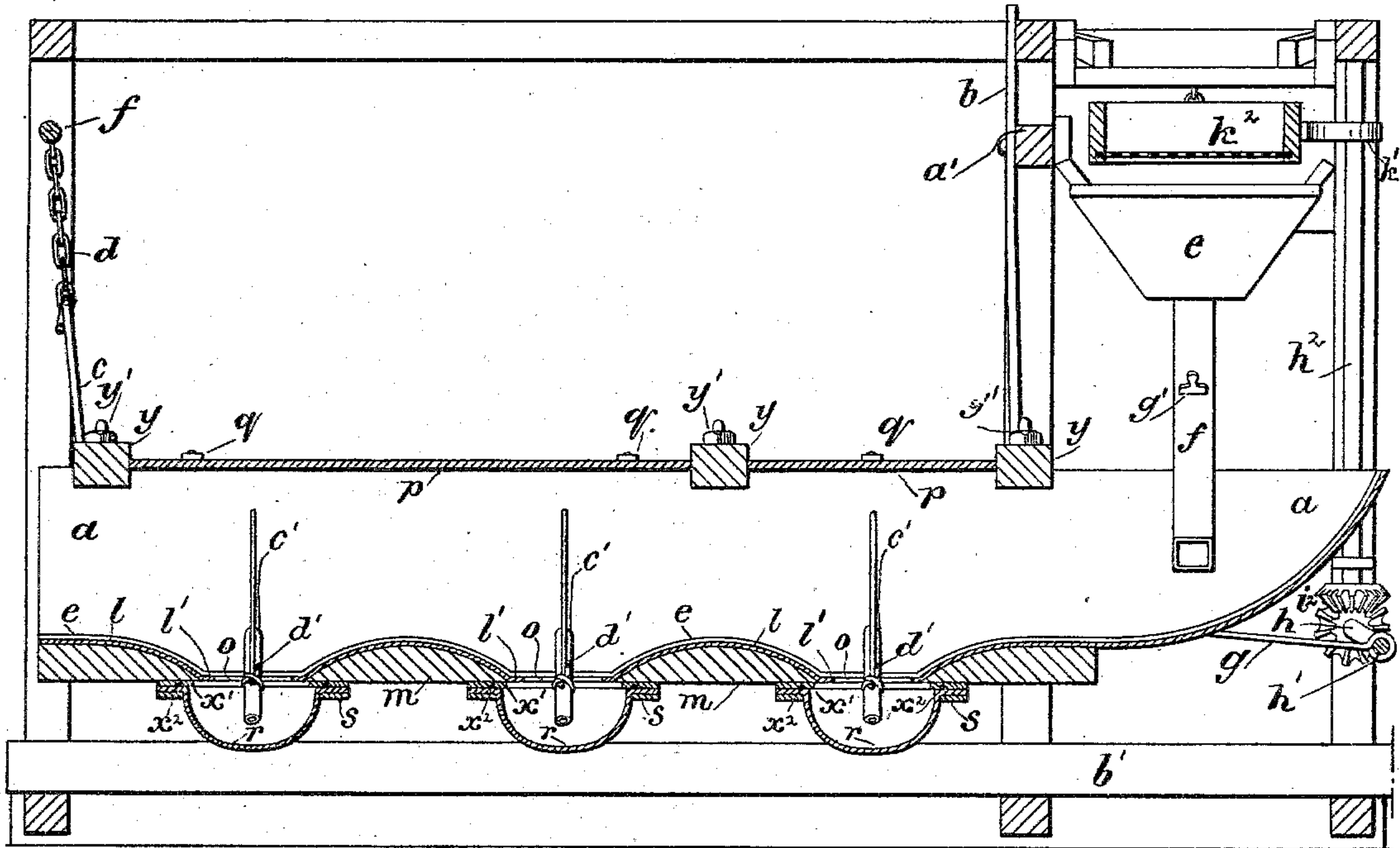
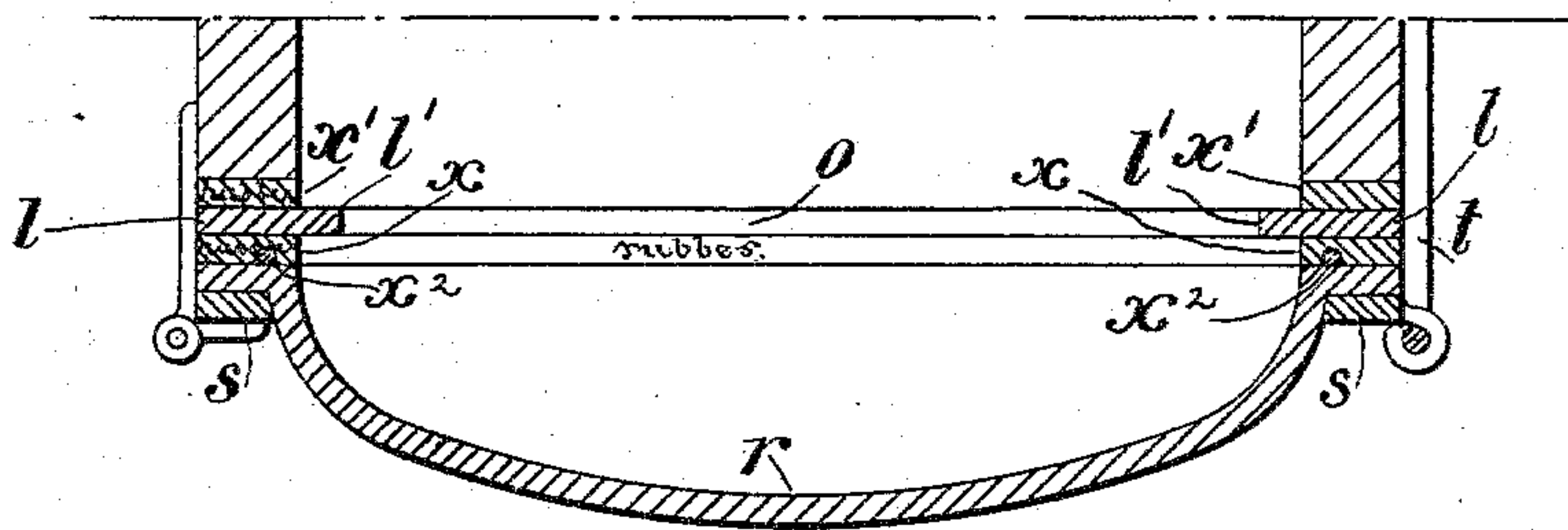


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM HAWKINS AND HENRY R. HAWKINS, OF OREGON, MISSOURI.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 281,060, dated July 10, 1883.

Application filed March 13, 1883 (Model.)

To all whom it may concern:

Be it known that we, WILLIAM HAWKINS and HENRY R. HAWKINS, of Oregon, in the county of Holt and State of Missouri, have invented a new and useful Improvement in Amalgamators, of which the following is a full, clear, and exact description.

The object of our invention is to provide a practical amalgamating apparatus adapted to be used in wet or dry placer diggings; and the invention consists of the construction, arrangement, and combinations of parts, all as hereinafter described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of our new and improved ore-concentrator. Fig. 2 is a cross-sectional elevation of the same. Fig. 3 is a detailed view, showing the notched lever for locking the mercury-pans in place. Fig. 4 is a longitudinal sectional elevation through one of the flumes, and Fig. 5 is a detailed cross-sectional elevation through one of the mercury pans or receptacles.

We use a suitable support and frame, and, preferably, the two flumes, *a*, which may be of any suitable size. These flumes are swung upon the springs *b* at the head of the machine and at their rear ends, and also at such other intermediate points in their length as may be deemed necessary to sustain them when in operation upon the bails *c*, to which are attached the chains *d*, which are attached at their upper ends to the winding-shafts *f*, by which the rear ends of the flumes are elevated as needed to facilitate the passage of the sand or other material through them, and this shaft is provided with the ratchet *e*, and the frame with the pawl *e'*, that is adapted to engage with the ratchet for holding the winding-shaft at any desired position. At the front ends the flumes are provided with the connecting-bails *g*, by which the flumes are attached to the cranks *h' h'* of the crank-shaft *h*, which is journaled in suitable bearings in the posts of the frame, and by which the flumes are reciprocated. The cranks *h' h'* are formed on opposite sides of the shaft, so that the reciprocating movements of the flumes will

counterbalance each other, and thus prevent unnecessary racking and strains of the flumes on the frame and shaft. The crank-shaft should be made in two parts and coupled together by the coupling *i'*, so that suitable pulleys or gear-wheels may be put upon the shaft for connecting the machine with horse, steam, or other motive power. When the machine is intended only for hand use, the shaft will be provided with the crank *j* at one or both ends, by which it may be turned. The bottoms of the flumes are made in waves, and are inclined at their forward ends to receive the sand or other material from the hopper *e'*. The bottoms may be made of the sheet-metal plates *l*, which are held in the form of waves up against the lower edges of the side boards of the flumes by the curved bottom boards, *m*.

In the trough of each wave are formed through the bottoms *l* the slots or openings *o*, that reach nearly across the flume, as shown in Figs. 2 and 5. The side walls of the flumes, if made of plank, should be lined, especially in dry digging, with amalgamated plates, which may be held by any suitable means at top and bottom, so that they can be removed for removing the gold. The covers *p* are also lined with or made of amalgamated plates, and are held in place by the buttons *q*, which covers or plates *p* serve to catch float and flour gold, which may rise either from the vibrating motion of the flumes or from the air-blast, hereinafter described.

Underneath or immediately below the slots or openings *o* in the bottom plates of the flumes are held the pans or receptacles *r* for holding mercury and for gathering the gold. These pans should be made of amalgamated plates or sheet-copper, and should be made large enough so that the bottom plates around the openings *o* will project sufficiently over the pans all around, as at *l'*, Fig. 5, to form a check to the mercury and prevent it from flowing out of the pans with the motion of the flumes. The pans are held in place up under the bottoms of the flumes by the frames *s*, hinged to one side of the flume, and fastened upon the other with the hasps *t*, hinged upon the free ends of the frames, through which hasps the levers *u* pass, which levers are adapted to be held by the springs *v*, as shown clearly in Fig. 1, and

the levers *u* are notched, as shown at *w*, Fig. 3, in which notches the hasps are adapted to rest, so that when the levers are turned up they will draw the frames *s* and pans *r* tightly up against the bottoms of the flumes, and between the edges of the pans and the flume bottoms *l* are placed the strips *x*, of soft rubber, and between the bottoms *l* and the lower edges of the sides of the flumes are placed the strips *x'*, of soft rubber, so that the whole may be made perfectly tight to prevent all waste of material; and for still greater security against leakage we place the band *x²* of wire upon the flanges of the pans *r*, so that when the pans are drawn up tight these wires will be embraced in the rubber strips *x*, and make the joints perfectly water and mercury tight.

y y' are respectively clamp-bars and rods for giving strength and rigidity to the flumes; and *z* represents guards fastened upon the foundation of the machine upon both sides of the flumes for the purpose of preventing the flumes from wobbling, and if the side walls of the flumes are of wood, suitable chafe-plates will be provided for the guard-plates to work against for protecting the walls of the flumes.

The supporting-springs *b* at the head of the flumes have the effect of assisting the motion in connection with the power used, whether manual or mechanical, and should be long enough to pass on or beyond the upper cross-piece of the frame, while at the same time they are bolted fast to the cross-piece *a'* beneath, thus equalizing the strain upon them, as will be understood from Figs. 1 and 4.

Placed upon the foundation of the machine, between the flumes *a a*, are the air mains or pipes *b'*, which are closed at the rear ends, and leading from these pipes are the flexible pipes *c'*, which reach into the flumes, and their inner ends held by the brace-rods *d'* at the center of and down somewhat into the mercury-pans *r*, as shown in Fig. 2, for directing the blasts of air full upon the concaved bottoms of the pans, so that the blasts of air will spread in every direction for blowing out of the mercury-pans the quicksand, and other light substances in the dry material being worked, thus keeping the mercury-pans from being choked up with foreign matter and keeping them in good condition for receiving the black sand and nuggets of gold. Any float or flour gold which may escape amalgamation with the mercury in the pans and driven out by the blasts of air will be caught and retained by the amalgamated side and covering plates of the flumes.

In diggings where there is plenty of water, a supply of water will be admitted to the flumes with the material to be worked, and then the blasts of air serve to agitate the pulp sufficiently to carry off all refuse matter, leaving scarcely anything but the black sand and gold and the mercury in the pans, thus causing all

of the gold to be amalgamated and saved, while the refuse matter will be carried off at the ends of the flumes by the reciprocation and pitch of the flumes.

The blasts of air will be supplied to the pipes *b'* from a suitable blower with which they will be connected.

The auriferous sand or earth to be worked is fed to the flumes by means of the hopper *e'*, which has the diverging spouts *f'*, which lead to the flumes, and which are provided with the cut-off slides *g'*, by which the flow of the material may be regulated.

Above the hopper is placed the screen *k²* to which the material is first shoveled or elevated, and a vibrating motion is imparted to this screen from the crank-shaft *h* through the vertical shaft *h²*, beveled gears *i²*, and eccentric *k'*, for rapidly and thoroughly screening out the coarse material which is passed off over the chute *l²*, arranged under the lower end of the screen, as shown in Fig. 1. There may be two or more screens of different mesh and made interchangeable with each other, to be used according to the kind of material being worked.

Constructed in this manner, it will be seen that the machine is well adapted to be used either as a wet or dry amalgamator, and that it may be made small enough for hand use or large and heavy to be run by horse, steam, electric, or other motive power, and that the flumes may be used singly or in gangs, as desired.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The bottoms *l* of the flumes, having the slots *o*, in combination with the mercury-holders *r* and the hinged frames *s*, substantially as and for the purposes set forth.

2. The combination, with the separate mercury-holders *r*, of the hinged frames *s*, hasps *t*, and notched levers *u*, substantially as and for the purposes set forth.

3. The bottoms *l* of the flumes, having the openings *o* and strips of rubber *x*, and the mercury-holders *r*, provided with the wires *x²*, in combination with the hinged frames *s*, hasps *t*, and notched levers *u*, substantially as and for the purposes set forth.

4. The bottoms *l*, made in the form of waves and held up against the lower edges of the walls of the flumes by the curved blocks *m*, in combination with the clamping mechanism, as and for the purposes set forth.

5. The combination, with the flumes and pans, of the rubber strips *x x'* and wire bands *x²*, as shown and described.

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Witnesses:

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