

(No Model.)

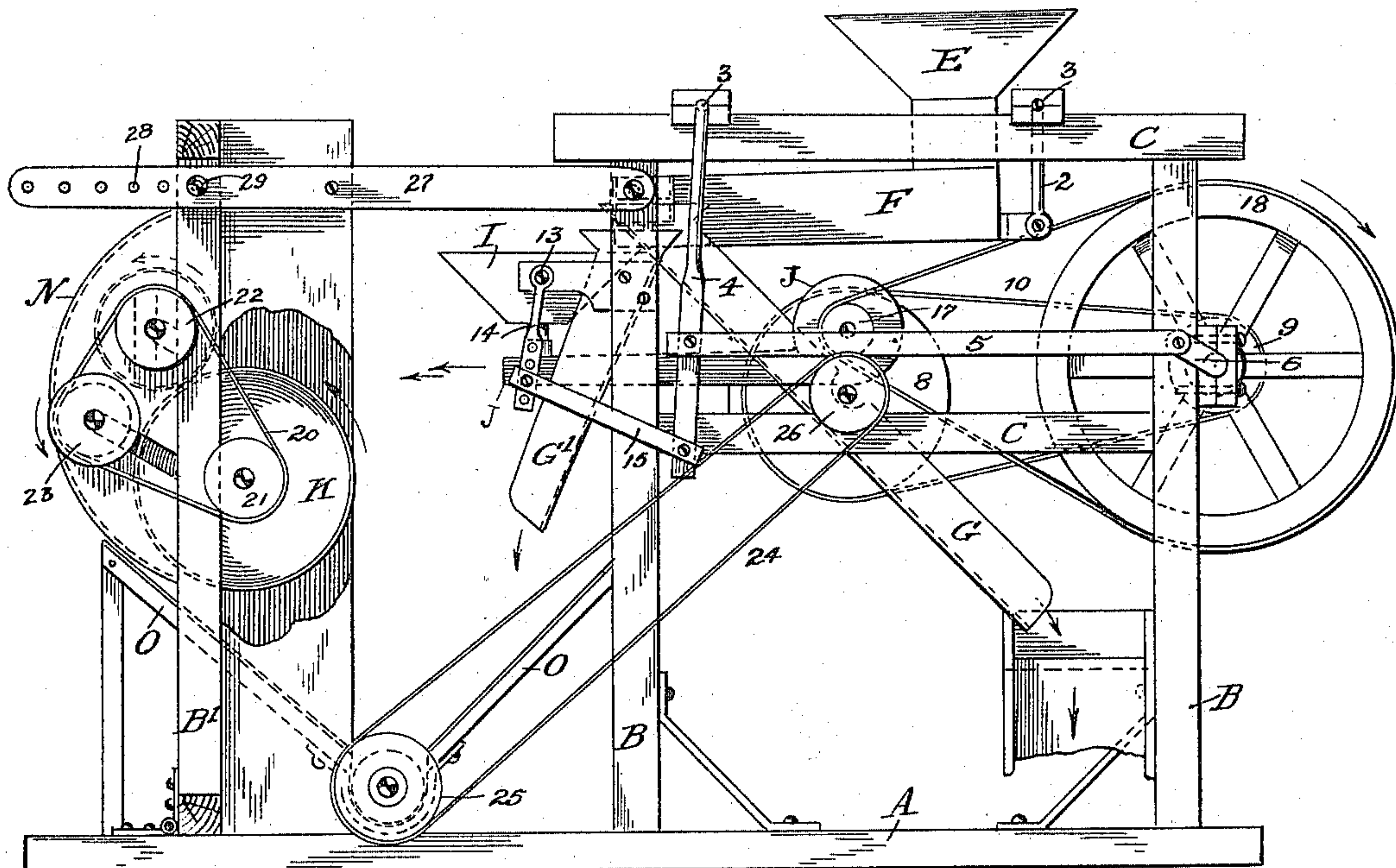
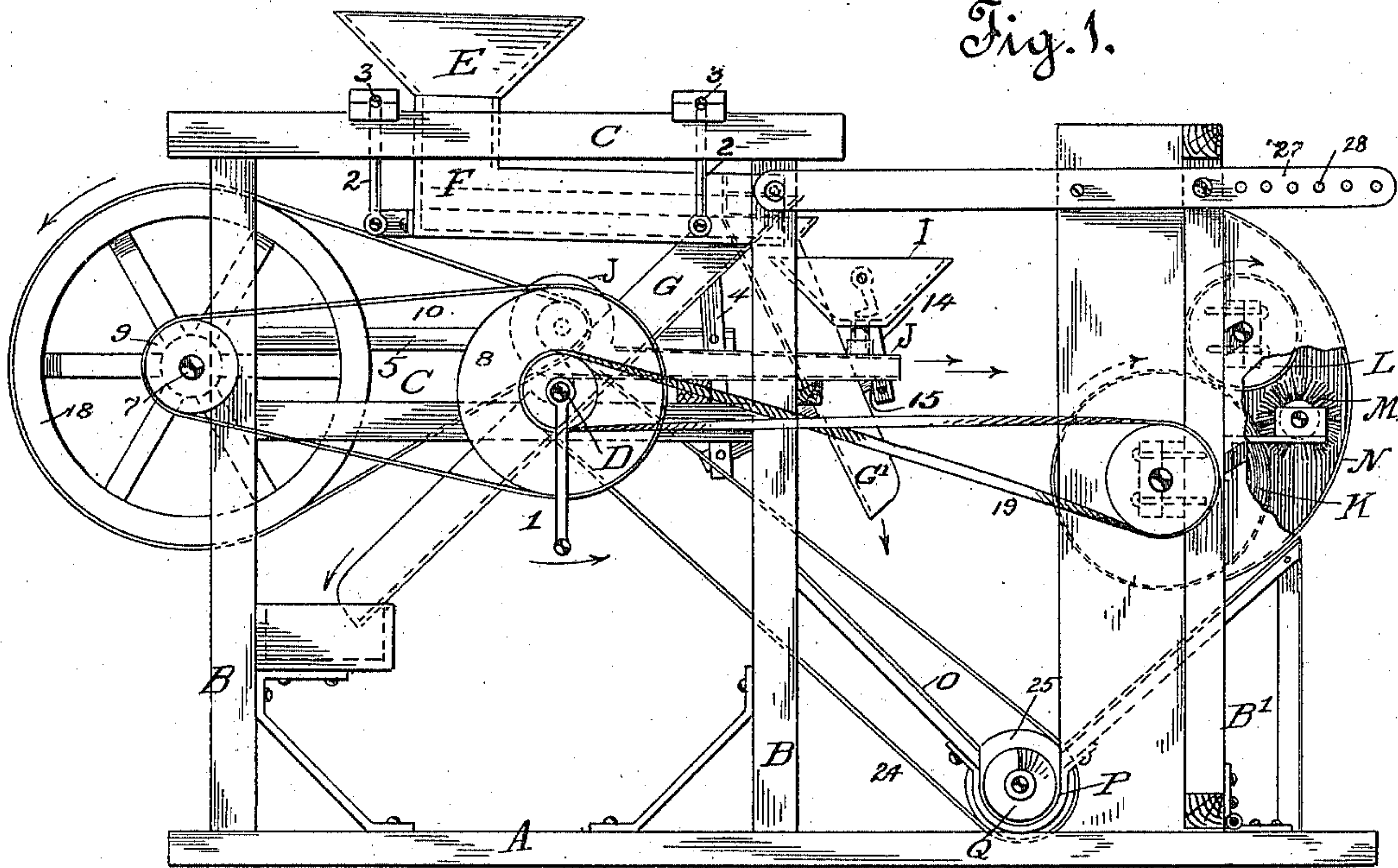
2 Sheets—Sheet 1.

J. MARSHALL.
GOLD SAVING APPARATUS.

No. 581,886.

Patented May 4, 1897.

Fig. 1.



Witnesses.

J. H. Montauville
M. Keely

Fig. 2.

Inventor.

John Marshall
by Spear & Seely
Attorneys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

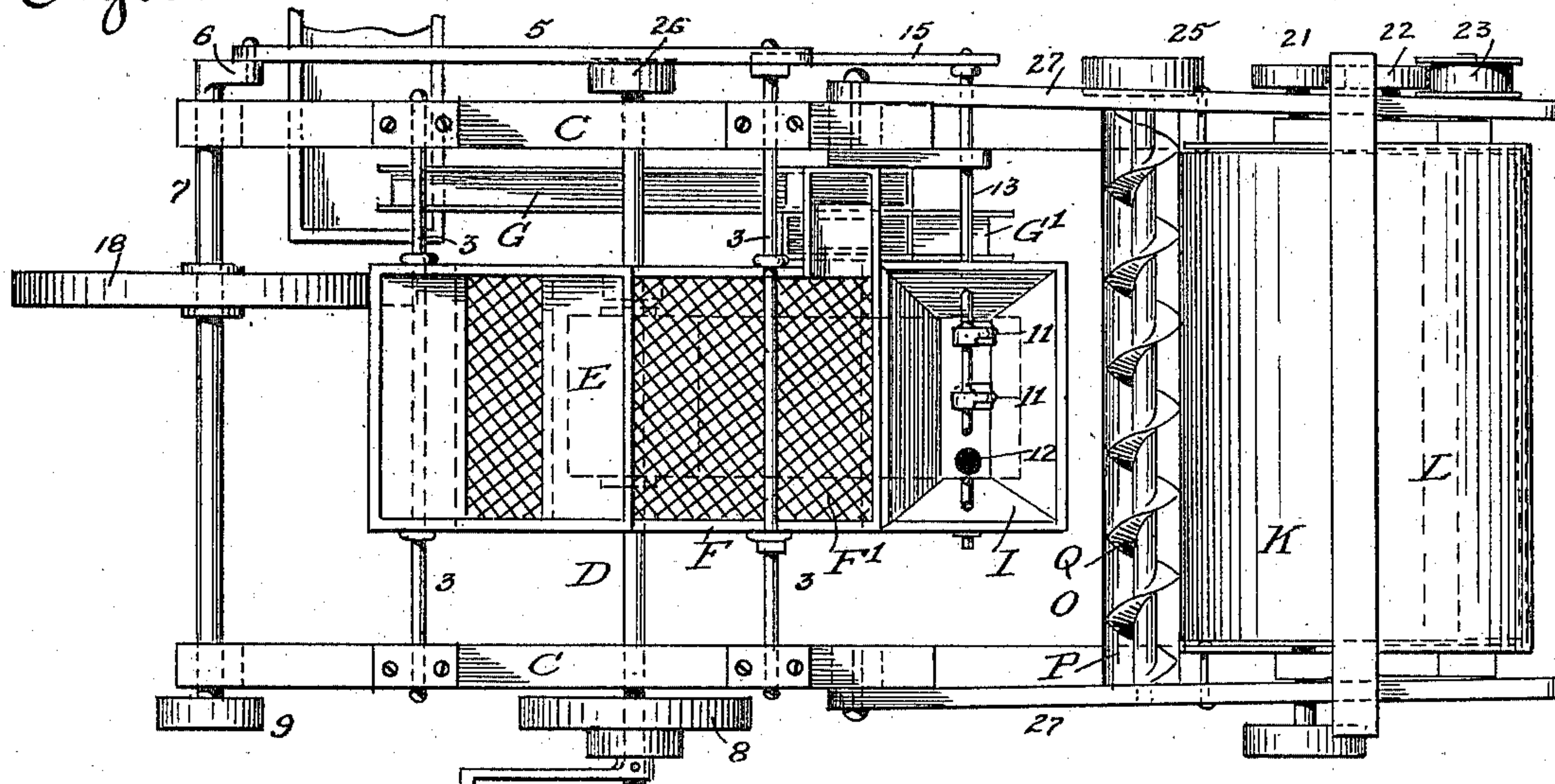


Fig. 4.

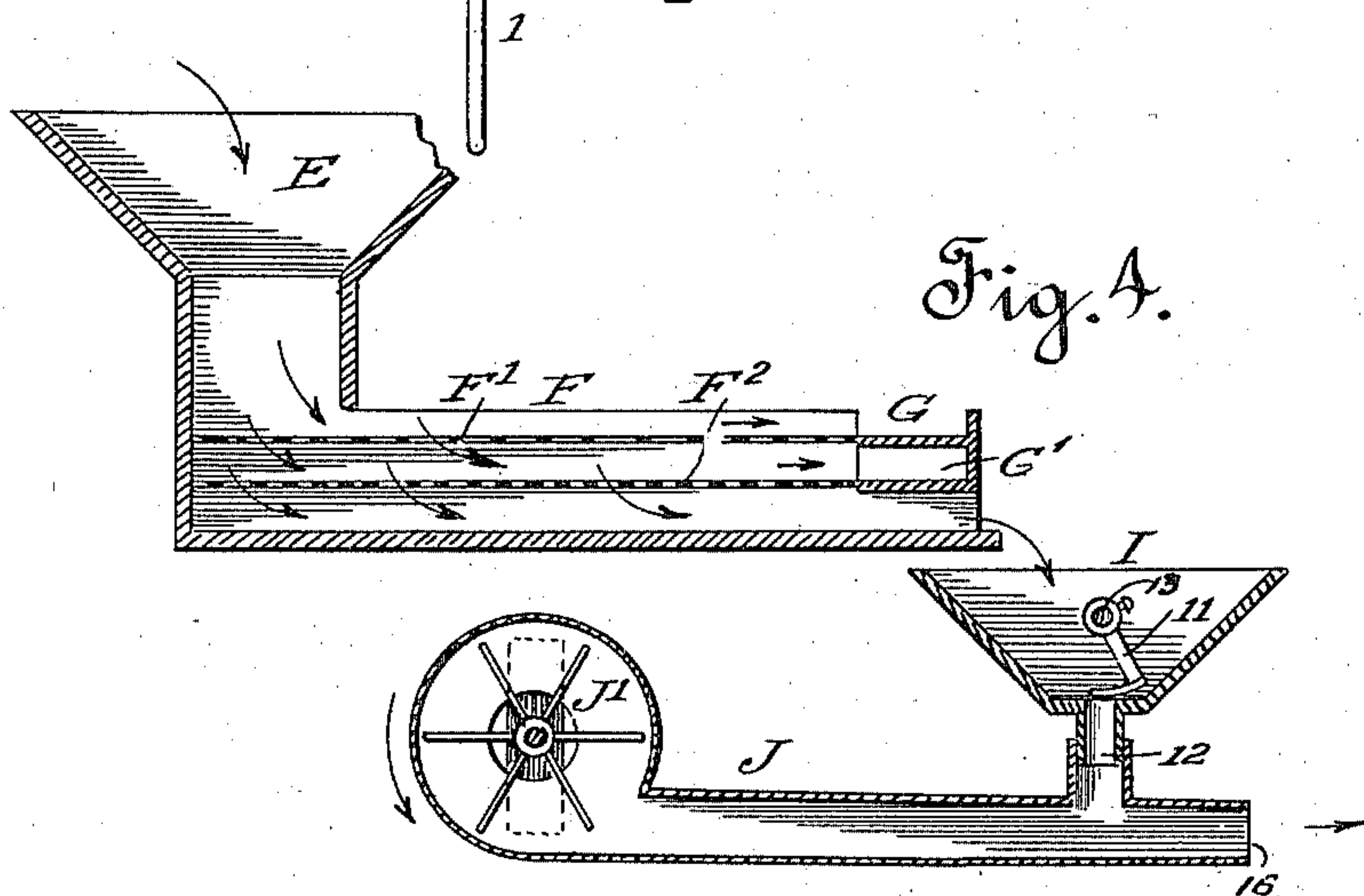
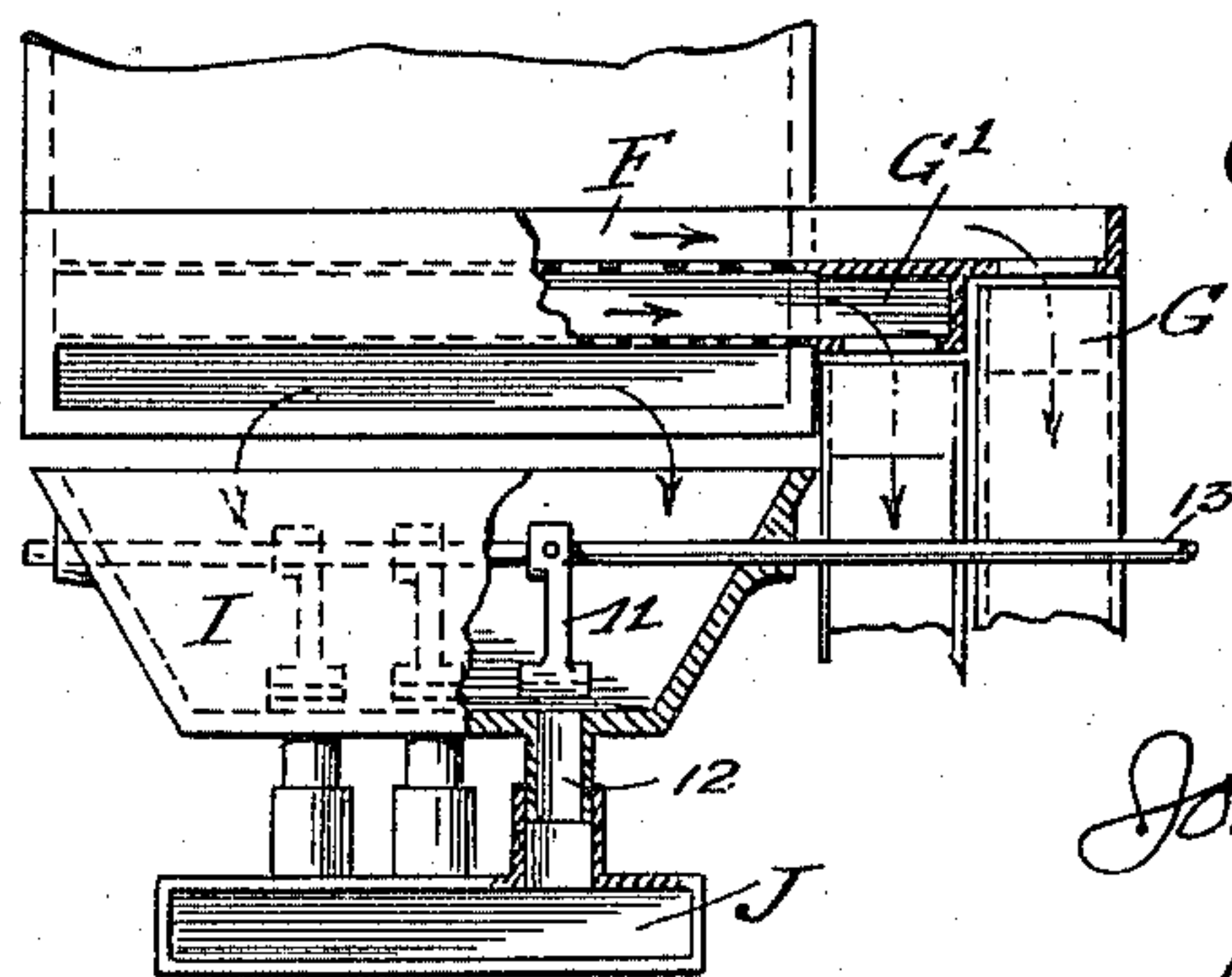


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN MARSHALL, OF FAIRFIELD, CALIFORNIA, ASSIGNOR TO THE MARSHALL GOLD SAVER COMPANY, OF SAME PLACE.

GOLD-SAVING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 581,886, dated May 4, 1897.

Application filed March 17, 1896. Serial No. 583,625. (No model.)

To all whom it may concern:

Be it known that I, JOHN MARSHALL, a citizen of the United States, residing at Fairfield, in the county of Solano and State of California, have invented certain new and useful Improvements in Gold-Saving Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to the saving of free gold contained in crushed ore or quartz or the auriferous sand or gravel by amalgamation; and it relates more particularly to special improvements upon an invention described and shown in an application for Letters Patent filed by me August 9, 1895, Serial No. 558,800. In that application was shown a blower by means of which the sand (by which I mean any kind of auriferous material crushed or naturally fine) was blown upon amalgamated rollers, which retained the free gold and permitted the sand to escape.

My present invention contains improvements partly relating to the feeding and distribution of the sand, partly to the blower, and partly to the amalgamator itself. Such improvements will be hereinafter pointed out, as well as many details of construction which need not be specifically referred to here, but which are fully hereinafter described, as well as shown in the accompanying drawings, in which—

Figure 1 is a side elevation of my gold-saving apparatus complete. Fig. 2 is also an elevation, but of the opposite side of the machine. Fig. 3 is a plan view. Fig. 4 is a detail longitudinal section of the hopper and distributor and of the blower-casing. Fig. 5 is a front elevation of Fig. 4, partly broken away.

The supporting-frame of the machine is shown in the drawings as composed of sills A, uprights B, and horizontal beams C, suitably braced and strengthened.

D is a driving-shaft journaled in the frame and provided with a power-pulley or with a hand-crank 1, as shown.

E represents the hopper, into which the auriferous sand, gravel, tailings, or other material is fed. This hopper is mounted above and discharges into a screen-box F, containing, preferably, two screens F' F² of different

mesh. The screen-box is slightly inclined, as shown, and with the hopper is given an end shake which agitates and at the same time feeds the contents along while the screens are separating them. In order to produce this end shake, I have shown the screen-box and hopper as suspended by links 2 2 from transverse rods 3, secured in the frame, Fig. 3. An arm 4, Fig. 4, is secured to the end of one of these rods and is connected by a pitman 5 to a crank 6, the latter being on one end of a shaft 7 at the rear of the machine. This shaft derives its motion from the driving-shaft by means of pulleys 8 9 and a belt 10.

The material in the screen-box is separated into three grades. The coarsest grade, which cannot be advantageously worked, is discharged from the screen F' into a chute G, by which it is carried away. The second grade is discharged by the screen F² into the chute G' and thence into the amalgamating-trough hereinafter described. The finest screenings discharged from the bottom of the shaking-box fall into the hopper I, which is a feed-hopper for the blower-casing J.

In the hopper I are agitators or scrapers 11, which oscillate above the discharge-tubes 12, leading to the casing J. (See Figs. 4 and 5.) These scrapers are secured to a rod 13, journaled in the hopper I and having at its end a crank 14. A pitman 15 connects this crank to the arm 4, before described, and the connection between crank 14 and pitman 15 is made adjustable, so as to vary the stroke of the stirrers. The blower-casing J consists of a circular chamber for the fan J' and an air-blast passage which terminates in a flat nozzle or discharge-opening 16 beyond the tubes 12. The shape of the nozzle causes the dust or sand to be discharged in a thin horizontal sheet. The blower-shaft is driven at high speed by the small pulley 17, which derives its motion from the relatively large pulley 18 upon the shaft 7 through a belt. (Shown in Fig. 2.) The sheet of sand or dust discharged by the blower spreads somewhat into fan shape and falls upon the surface of the rotary roller K, having an amalgamated surface, which is driven by a twisted belt 19 from the driving-shaft, so that its motion (arrows in Figs. 1 and 2) tends to carry the gold ad-

hering to it away from the blast. A second and smaller roller L and a brush M are all driven in the same direction by a belt 20, which connects together pulleys 21 22 23 on the respective shafts of the two rollers and the brush. The brush M runs in contact with both rollers K and L and brushes from them any sand which adheres as well as any particles of gold which are not amalgamated. All the material which is so brushed off, as well as any which has missed the amalgamated surfaces, is guided by a hood N into the transverse trough O, which is mounted upon the base of the frame in position to receive also the screenings from the chute G'. The inclined surfaces of this trough are also furnished with plates of amalgam. Such surfaces converge downwardly to a channel or well P, which contains mercury and in which is set a carrier Q, which is preferably a screw conveyer driven by a belt 24, which connects its shaft-pulley 25 to a pulley 26 on the driving-shaft. The carrier might, however, be an endless belt running in the well and having teeth or brushes and driven in the same way. The process of amalgamation is commenced by the rollers K L, continued by the inclined surfaces of the trough, and completed by the well of mercury, in which the screw revolves, the screw serving not only to agitate all the material and bring all of it into contact with the mercury, but also to drive off all the sand and waste at one end of the well. By these means I am enabled to save a very high percentage of free gold contained in any kind of pulverized auriferous material. The end of the main frame which supports the rollers K and L has its vertical standards B' hinged to the sills A and supported at the top by bars 27, pivoted to the fixed part of the frame. By such an adjusting device as the holes 28 and pins 29 the angle of this end of the frame may be changed, if required, so as to change the distance between the rollers and the blower should the blast be too strong, or the contrary, for the consistency of the sand. The rollers K and L are removable, as well as the brush and hood, and I can, if desired, adapt the machine to wet amalgamation by adding any suitable kind of water-distributor to supply water to the trough, which contains the screw conveyer.

Other modifications which may suggest themselves to those skilled in the art may, without invention, be made in my machine, and hence I do not limit myself to the exact details of construction shown in the drawings or herein described, having simply endeavored to show and describe what I consider the best embodiment of my invention.

What I claim is—

1. In an amalgamator, and in combination, a feed-hopper, an air-blower, amalgamated rollers in the line of the blast, a trough located in relation to said rollers so as to re-

ceive a portion of the material supplied to said surfaces, and a screw conveyer in such trough, substantially as described.

2. In an amalgamator, and in combination, a feed-hopper, screens for separating material delivered by said hopper, amalgamated surfaces, a blower for discharging one portion of the separated material upon such surfaces, an amalgamating-trough having a screw conveyer, and placed so as to receive material from said amalgamated surfaces, and a chute or passage for conveying another portion of said screened material directly to said trough, substantially as described.

3. In an amalgamator, the combination with an ore-feeding hopper and with a blower, of amalgamated rollers, adjustable with relation to their distance from said blower, substantially as described.

4. In an amalgamator, the combination with an ore-feeding hopper, and with a blower, of a movable support, means for adjusting said support relatively to the blower, means for holding said support in different positions of adjustment, and amalgamated rollers carried by and adjustable with said support, substantially as described.

5. In an amalgamator, the combination with an ore-feeding hopper, with a blower, of a hinged frame, and a roller having an amalgamated surface and journaled in said frame, and means for driving said roller, substantially as described.

6. In an amalgamator, the combination with the parallel amalgamated rollers, of a blower, and a rotary brush running in contact with both rollers, substantially as described.

7. In an amalgamator, the combination with an amalgamated roller, of a blower, a brush in contact with said roller, a trough beneath said roller and brush adapted to receive mercury, and a screw conveyer journaled in said trough, substantially as described.

8. In combination with a horizontal amalgamating-roller a blower, and a blower-casing having a horizontally-elongated discharge passage or nozzle whereby the material discharged is permitted to spread between the nozzle and said roller, substantially as described.

9. In an amalgamator, the combination with a driving-shaft, of two parallel rollers, a brush in contact with both rollers, pulleys on the shafts of said rollers and brush and a single belt upon said pulleys whereby said rollers and brush are driven simultaneously in the same direction, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 2d day of March, 1896.

JOHN MARSHALL.

Witnesses:

C. B. WEBSTER,
JNO. M. GREGORY.