

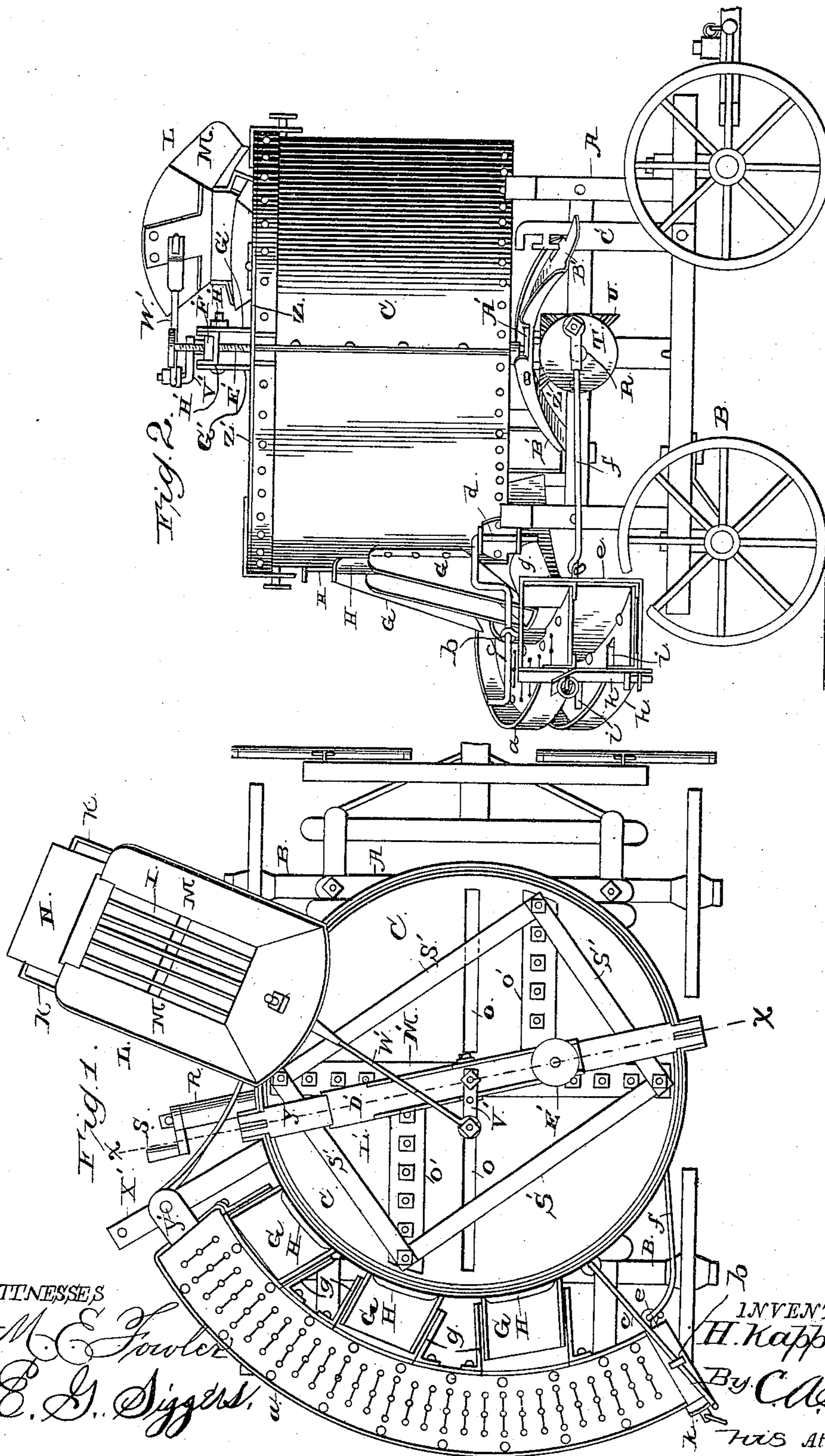
(No Model.)

3 Sheets—Sheet 1.

H. KAPPNER.
DRY ORE AMALGAMATOR.

No. 320,937.

Patented June 30, 1885.



WITNESSES

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INVENTOR

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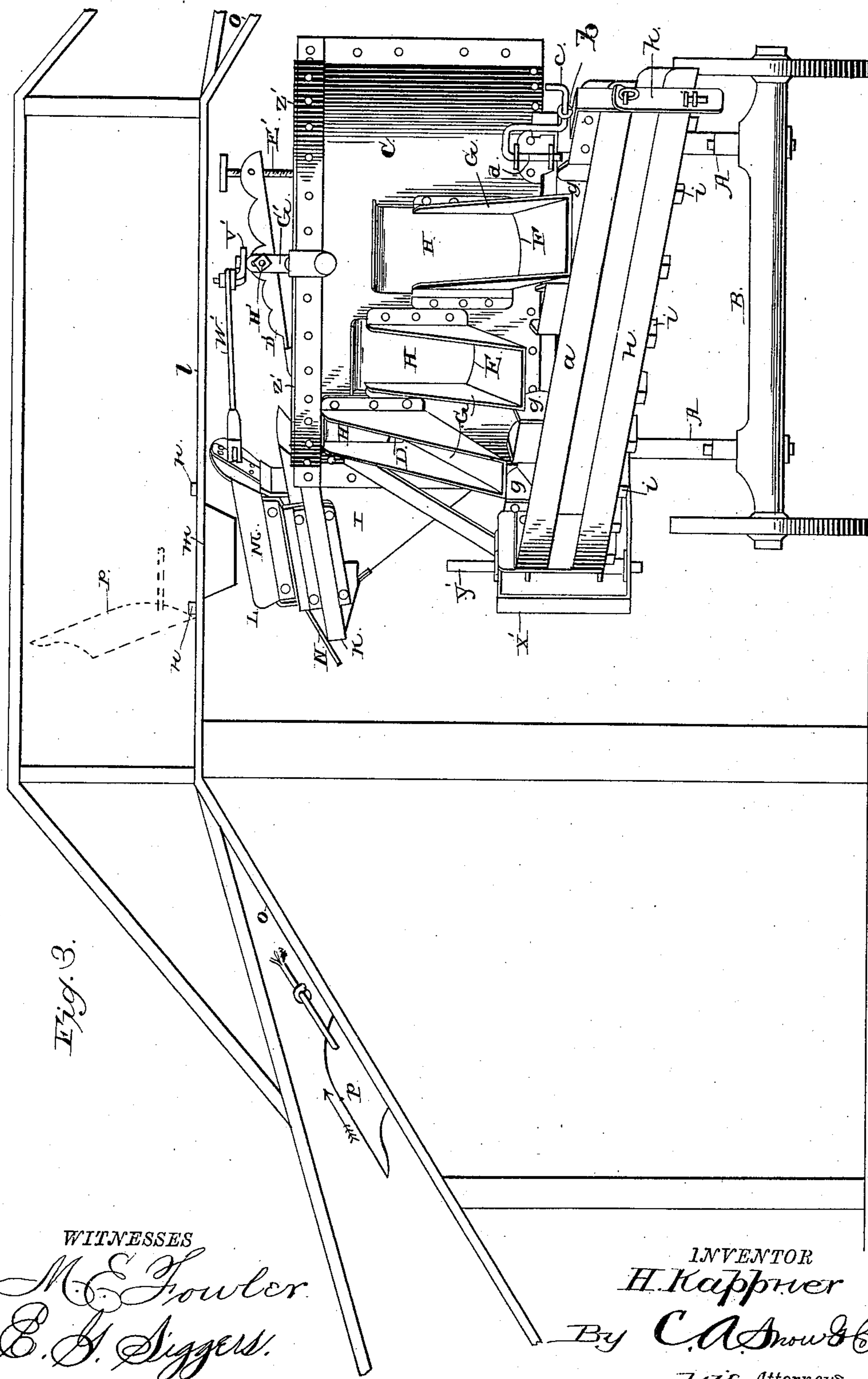
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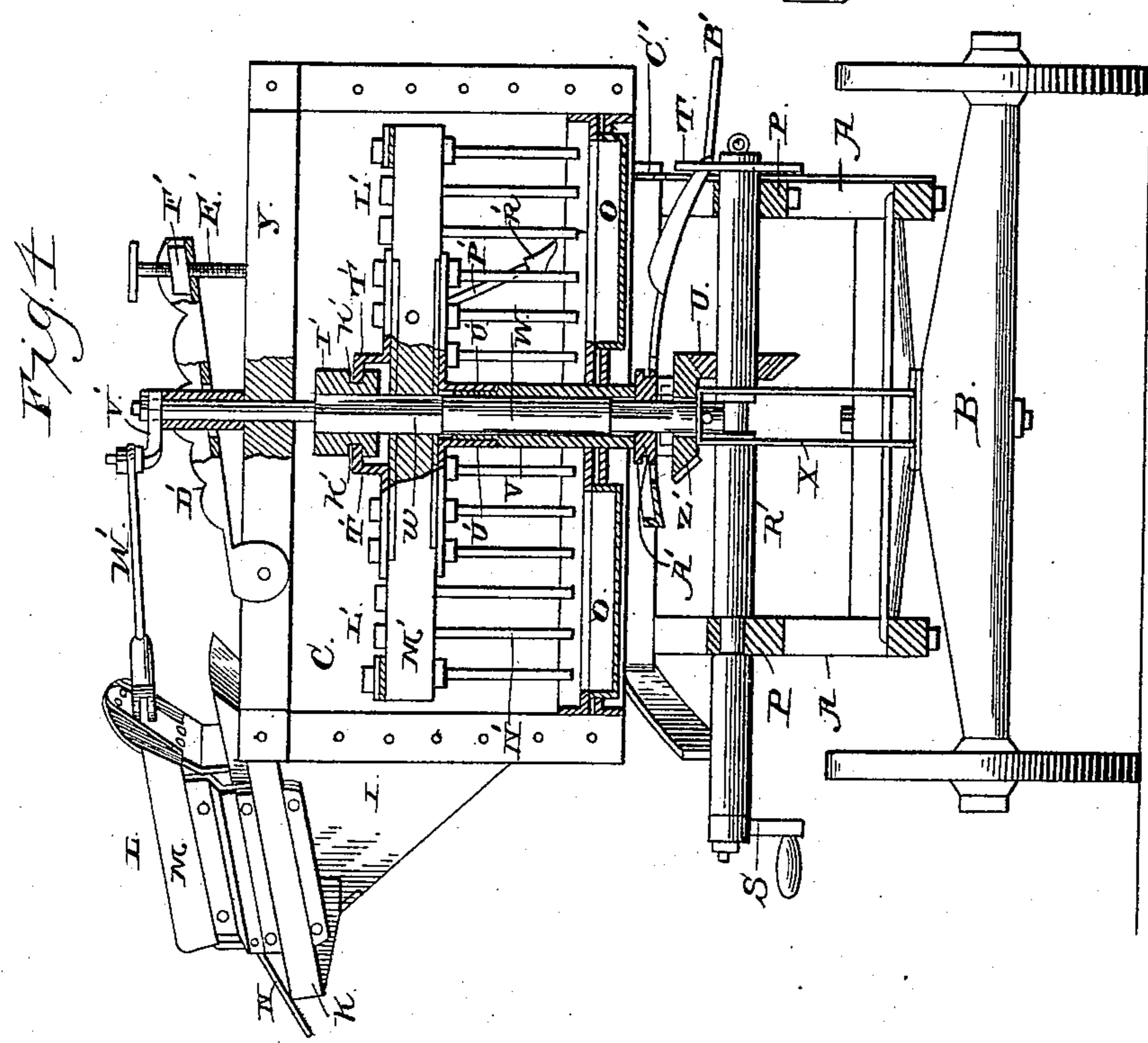
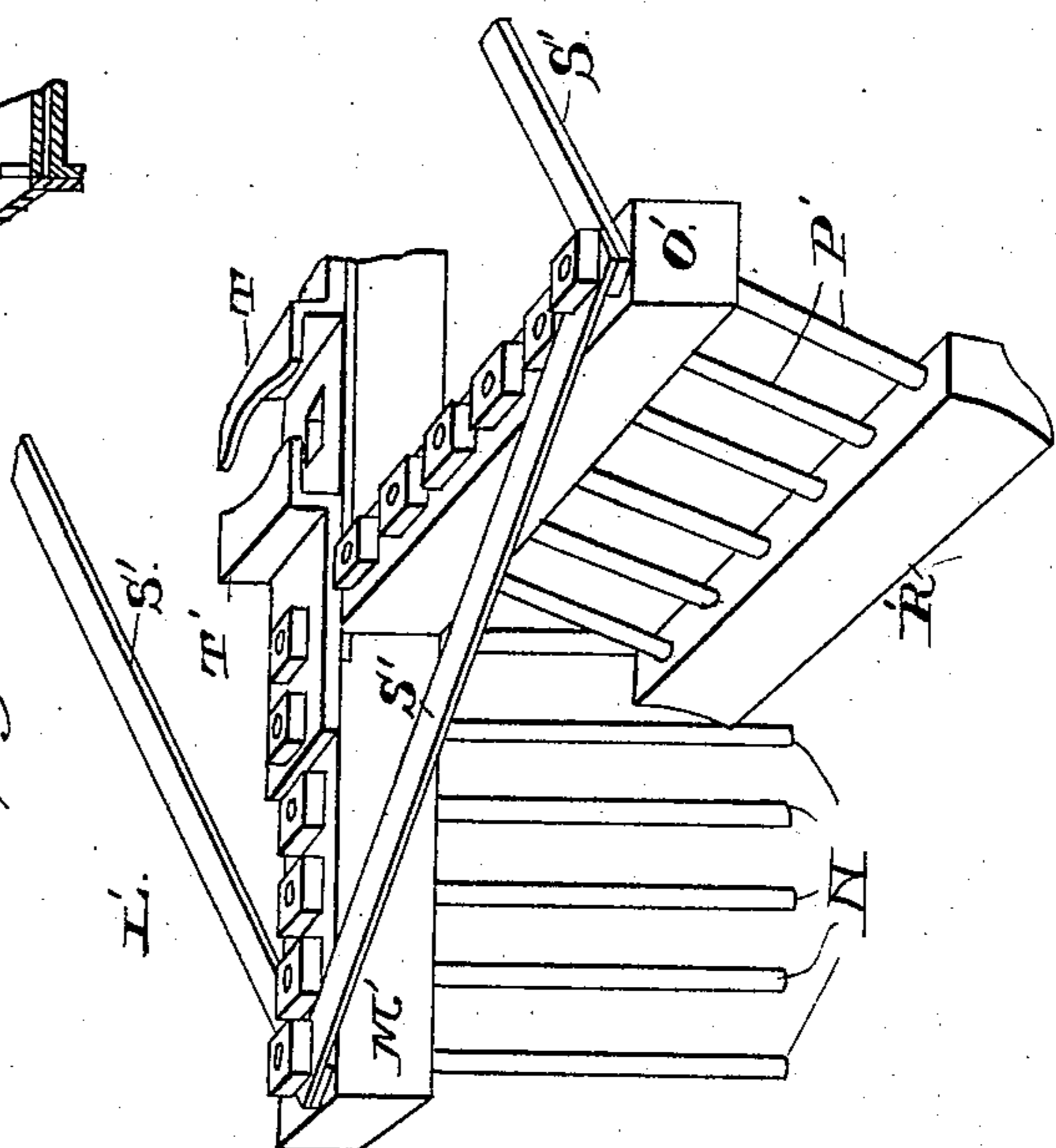
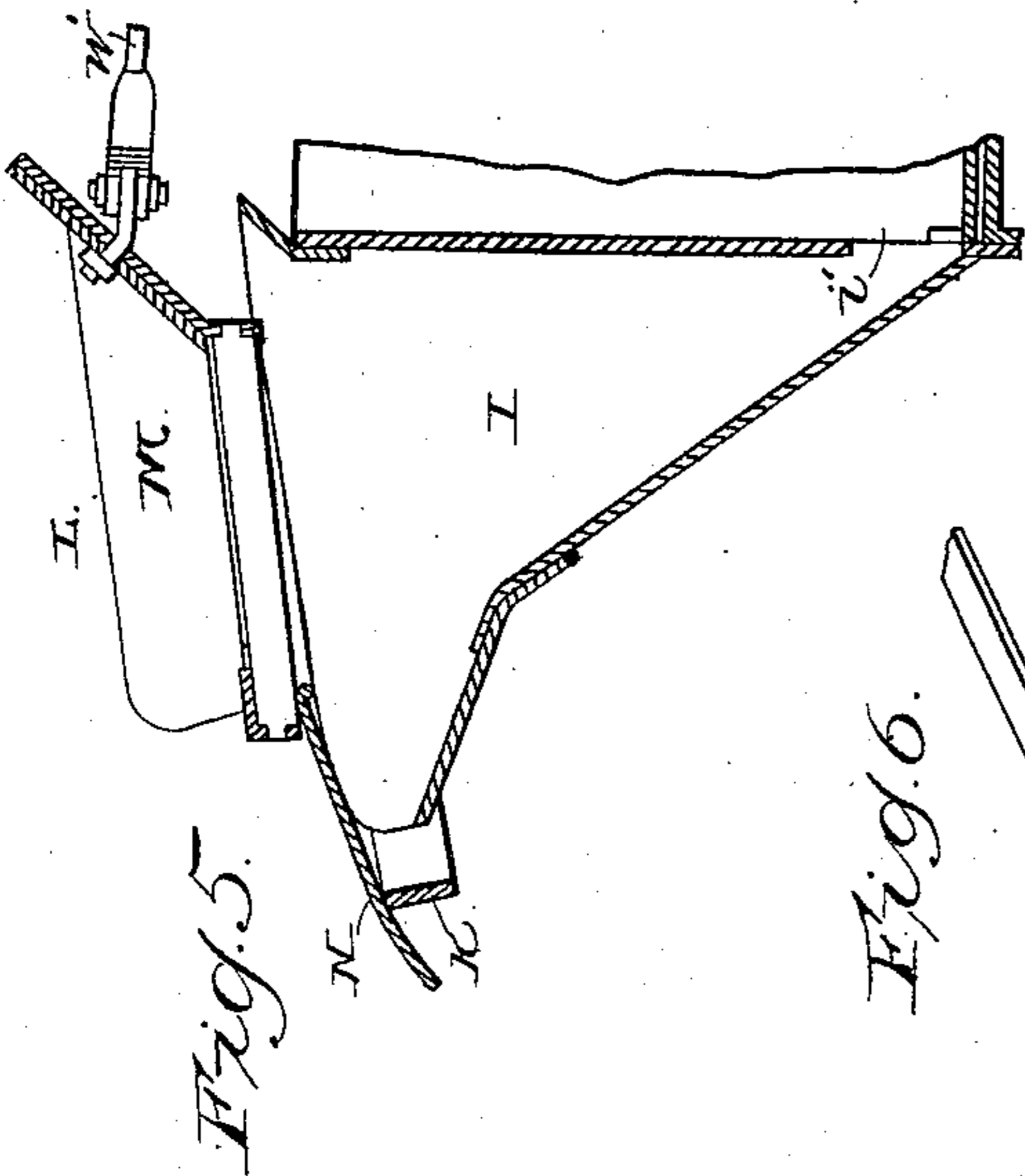
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UNITED STATES PATENT OFFICE.

HENRY KAPPNER, OF ELIZABETH, COLORADO.

DRY-ORE AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 320,937, dated June 30, 1885.

Application filed April 18, 1885. (No model.)

To all whom it may concern:

Be it known that I, HENRY KAPPNER, a citizen of the United States, residing at Elizabeth, in the county of Elbert and State of Colorado, have invented a new and useful Improvement in Dry-Ore Amalgamators, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improvement in dry-ore amalgamators; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of a machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a rear elevation. Fig. 4 is a vertical sectional view taken on the line *xx* of Fig. 1. Figs. 5 and 6 are detailed views.

A represents a rectangular frame, which is here shown as mounted upon a truck, B, to facilitate transportation of the machine from place to place.

On the frame A is bolted a cylindrical vessel or tub, C, which is provided on its rear side with the openings D E F, having spouts G and vertically-sliding doors H, by means of which the openings may be closed. The opening F is on a level with the bottom of the tub, and the openings D E are arranged on an ascending plane therefrom, the opening D being the highest.

On one side of the tub is secured a hopper, I, that communicates with the lower side of the tub through an opening, *i*'.

On the sides of the mouth of the hopper are secured inclined tracks or ways K, on which slides a reciprocating screen or sieve, L, which has an outwardly-flaring flange, M, and a hinged guard-plate, N, on its lower side. The function of the guard-plate is to prevent stones and screenings from falling over the lower side of the sieve and into the hopper and finding their way into the tub.

In the bottom of the tub are formed a number of riffles, O, which are filled with quick-silver, and the bottom of the tub may be made of magnetized metal or loadstone or silver-plated.

Journaled in blocks P on the frame A is a

transverse shaft, R, which is below the center of the tub.

To one end of the shaft is fixed a crank, S, if the machine is to be operated by hand, or a pulley if the machine is to be driven by steam, horse, or water power.

A crank-wheel, T, is fixed to the opposite end of the shaft, and near the center of the shaft is fixed a miter-gear wheel, U.

In the center of the tub is fixed a vertical hollow sleeve, V, through which passes a vertical shaft, W, the lower end of which has its bearing in a bracket, X, and the upper end of which is journaled in a cross-beam, Y, that is secured to the upper sides of the tub. That portion of the shaft W above the sleeve V is square, as at *w*.

On the lower end of the shaft W is loosely mounted a miter-gear wheel, Z', that meshes with the gear-wheel U.

A sliding clutch, A', is feathered on the lower end of the shaft W above the gear-wheel Z', and this clutch is engaged by a lever, B', that is hinged at one end to the frame A, and has its free end engaging with a vertical rack, C', that is secured to the opposite side of the frame. By means of the feathered clutch and the lever the gear-wheel Z' may be made fast with the shaft W, or it may be permitted to revolve loosely on said shaft, as will be very readily understood. When the wheel Z' is fast to the shaft, said shaft revolves.

Hinged on the cross-beam Y of the tub is a lever, D', the free end of which has a vertical screw, E', that passes through a nut, F', journaled in the lever, and that has its lower end swiveled in the beam Y.

Vertical straps or hangers G' are suspended from trunnions or bolts H' that project from the sides of the lever above the center of the tub, and to the lower ends of the hangers is suspended a hollow cylindrical collar, I', having a horizontal annular groove, K', near its lower end, in its outer side.

I' represents a revolving rake or stirrer, which is composed of the beam M', having, depending stirrer-teeth N', beams O', secured at right angles to the beam M' out of line with the center thereof, stirrer-teeth P', that depend from the beams O', sweeps R', secured to the lower ends of the teeth P', and brace-rods S',

that connect the outer ends of the beams M' and O'. The stirrer L' is swiveled to the collar I' by means of plates T', that are bolted to the upper side of the beam M' and enter the groove K'.

A square opening is made in the center of the beam M' to receive the square portion of the shaft W, and from the lower side of the beam M', at the center thereof, depends a vertical sleeve, U', that fits over the reduced upper portion of the sleeve V.

To the upper end of the shaft W is secured a crank, V', that is connected by a rod, W', with the reciprocating sieve L.

When the machine is operated, the sand or powdered ore, in which is the gold, is fed to the reciprocating sieve L, through the hopper I, into the tub, where it is thoroughly stirred by the revolving stirrer L', which causes the particles of gold to descend to the bottom of the tub, and as they are swept over the quicksilver in the riffles they are caught by the quicksilver and held.

From one side of the tub projects a bracket, X', in which is secured a vertical rod, Y'.

a represents an inclined segment-shaped screen, that is hinged to the rod Y', and has its free end provided with a swiveled eye, *b*, that slides on a horizontal rod, *c*, that is hinged to the side of the tub, as shown at *d*. A keeper, *e*, depends from the lower free end of the screen *a*, and is connected by a connecting-rod, *f*, to the crank-wheel T of the shaft R. The screen *a* has troughs *g* projecting from its inner side, which troughs are below the spouts G of the tub.

Hinged to the rod Y', below the screen *a*, is an inclined segment-shaped chute, *h*, which is provided at its bottom with transverse riffles *i*, that are filled with quicksilver. The free end of the chute *h* is secured in the keeper *e* below the free end of the screen *a*, and can be released from said keeper and swung around independently of the screen *a* by a hasp, *k*, with which the keeper is provided.

When the amalgamator is in motion, the openings F and E of the tub are closed, and only the opening D left open. The sand and ore in the tub is forced out of this opening onto the screen *a*, and in descending the screen the particles of gold fall into the chute *h*, and are caught by the quicksilver in the riffles thereof. When the ore and sand have been discharged from the tub, so as to reduce the quantity below the level of the opening D, the slide controlling the opening E is then raised, and when it is desired to remove all the sand and ore from the tub after it has been sufficiently stirred the opening F is employed. By suspending the stirrer from the hinged lever, and by means of the screw that supports the free end of the lever, the stirrer can be raised or lowered to any desired extent in the tub.

The function of the sleeves V and U' is to prevent sand and gold from working out of the

tub through the opening in the bottom of the tub through which the shaft passes.

In order to prevent any of the fine particles of gold from being carried by the wind away from the tub, I provide covers Z for the tub, as shown.

An amalgamator thus constructed is thoroughly efficient, is easily operated, and performs the operation of separating the gold from the sand or ore by a dry process and without the use of water.

In Fig. 3 I illustrate a platform which is erected over the amalgamator when the separator is to be employed for some time in one place. This platform *l* has an opening, *m*, and a discharge-chute leading from the lower side of this opening to the reciprocating sieve. Cleats *n* are secured on the platform on both sides of the opening *m*. Inclines *o* lead to the platform, one on each end thereof. Horses are attached to dump-scoops *p*, which scrape up the sand, and as the scoop is being drawn over the platform it catches against one of the cleats and is tilted and discharges its contents into the opening *m*.

I am aware that amalgamators have been heretofore constructed with riffles in the bottoms and openings in the sides of the tubs, and with revolving stirrers having stirring-teeth and sweeps, and with stirrers that are vertically adjustable in the tubs; and these features, broadly, I disclaim.

Having thus described my invention, I claim—

1. The combination of the tub having the riffles in its bottom and openings (one or more) in its side with the rotating stirrer located in the tub, the screen for receiving the sand or ore as it is discharged from the tub, and the chute having the riffles located below the screen, substantially as described.

2. The combination of the tub having the openings (one or more) in its side with the rotating stirrer located in the tub, the hinged screen for receiving the sand or ore as it is discharged from the tub, and the hinged chute having the riffles and located below the screen, and means for reciprocating the free ends of the screen and chute, substantially as described.

3. The combination of the tub having the riffles in its bottom and the openings in its side arranged on an ascending plane and slides or doors for the openings with the vertical rotating shaft in the tub, the lever hinged to a beam in the upper side of the tub, the screw for raising or lowering the free end of the lever, and the stirrer swiveled to a collar that depends from the hinged lever, whereby the stirrer may be raised or lowered in the tub, substantially as described.

4. The combination of the tub having the riffles in its bottom and the openings in its side arranged on an ascending plane and slides or doors for the openings and the vertical sleeve in the center of the tub with the rotating shaft that passes through the vertical sleeve,

the lever hinged to a beam in the upper side of the tub, the screw for raising or lowering the free end of the lever, and the stirrer sliding on the squared or splined portion of the
5 rotating shaft, and the collar depending from the hinged lever, the stirrer being swiveled to said collar, substantially as described.

10 5. The separator embodying the following elements: the tub having the riffles in its bottom, the openings in its side arranged on an ascending plane, slides or doors for the openings, the hopper communicating with the tub, the rotating stirrer located in the tub, the screw and lever for raising and lowering the

stirrer, the reciprocating screen or sieve operating over the mouth of the hopper, and the hinged reciprocating screen for receiving the sand and ore as it is discharged from the tub, and the hinged reciprocating chute under the screen having the riffles in its bottom, substantially as described. 15 20

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

HENRY KAPPNER.

Witnesses:

FRANK JOSEPH SPINDTER,
JOSEPH H. CRAIG.