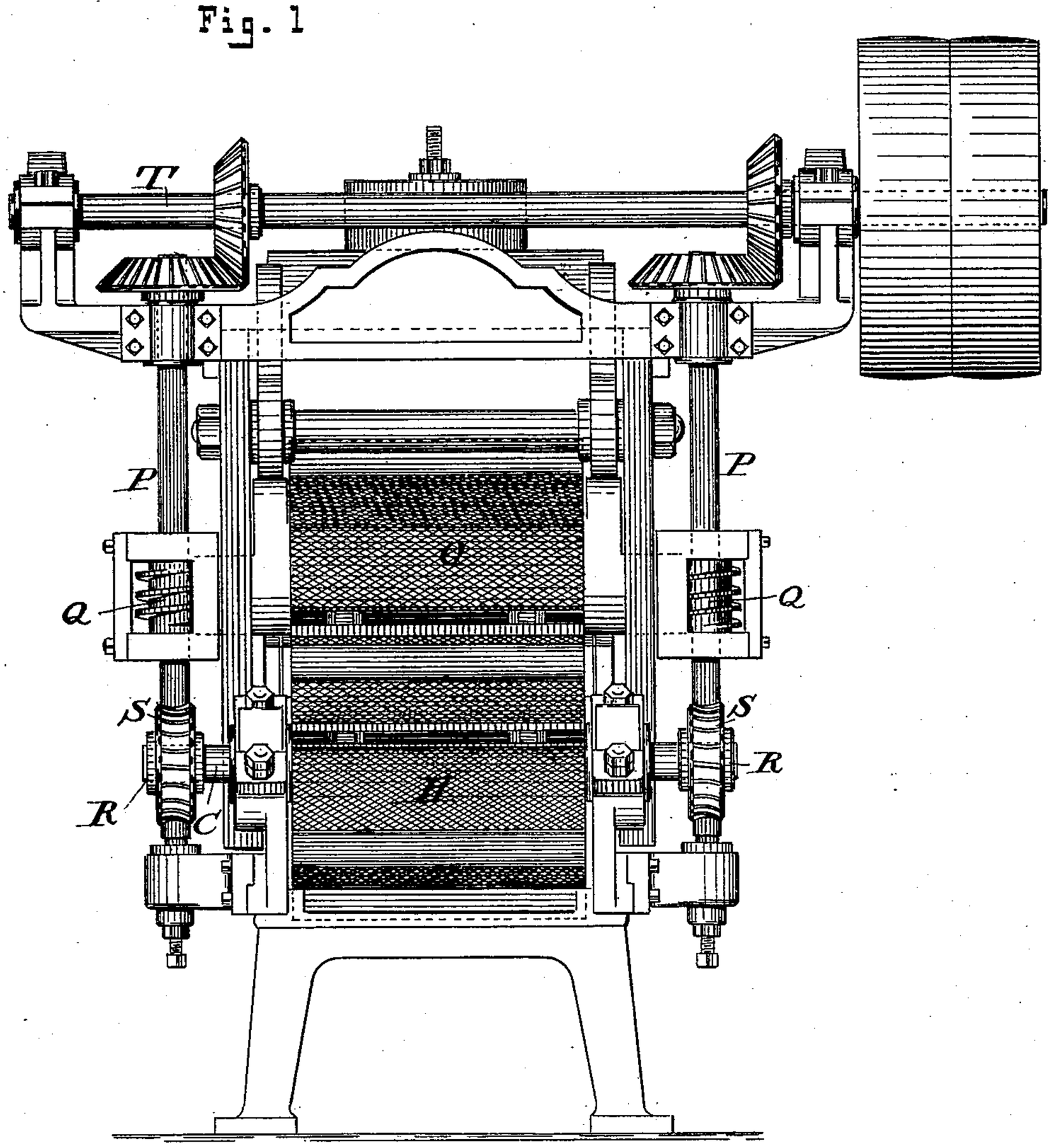
(No Model.) 5 Sheets—Sheet 1.

J. F. GUBBINS.

Press.

No. 243,369. Patented June 28, 1881.

Fig. 1



WITNESSES:

J. C. Wilcke

C. H. Comiskey

INVENTOR:

John F. Gubbins

Dodge & Sons

attys.

(No Model.) 5 Sheets—Sheet 2.

J. F. GUBBINS.

Press.

No. 243,369. **Patented June 28, 1881.**

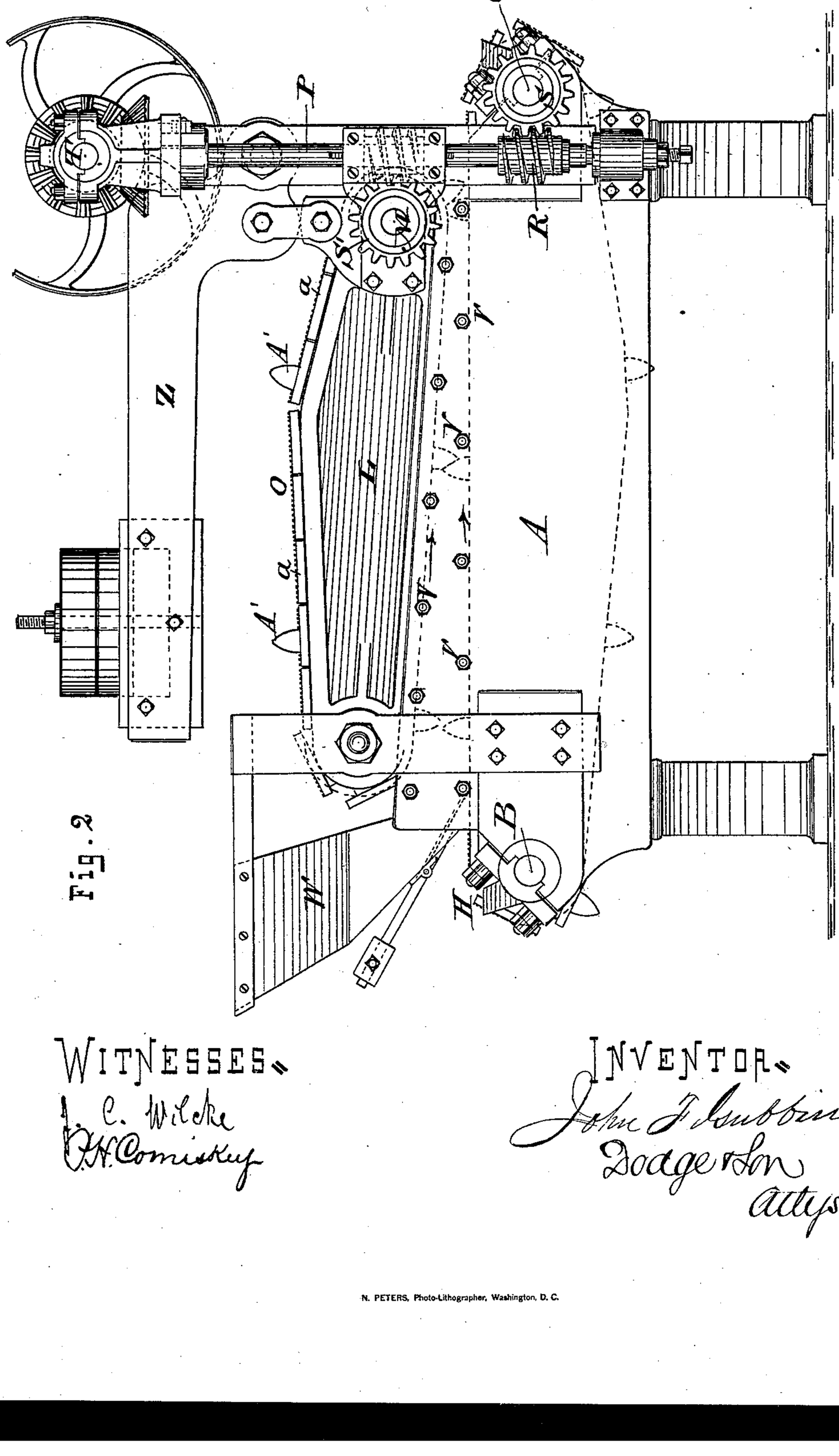


Fig. 2.

WITNESSES.

J. C. Wilcke

B. F. Comiskey

INVENTOR.

John F. Gubbins

Dodger & Son

Attys.

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J. F. GUBBINS.

Press.

No. 243,369. Patented June 28, 1881.

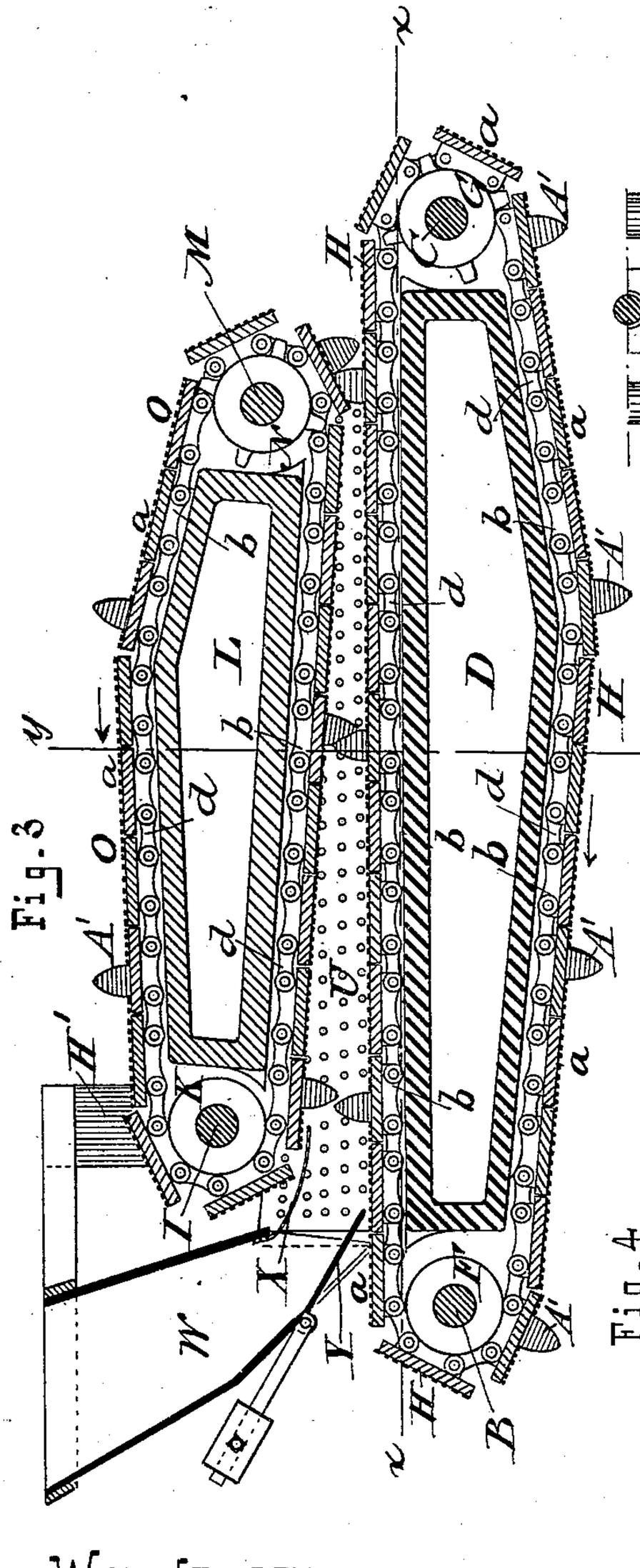


Fig. 3

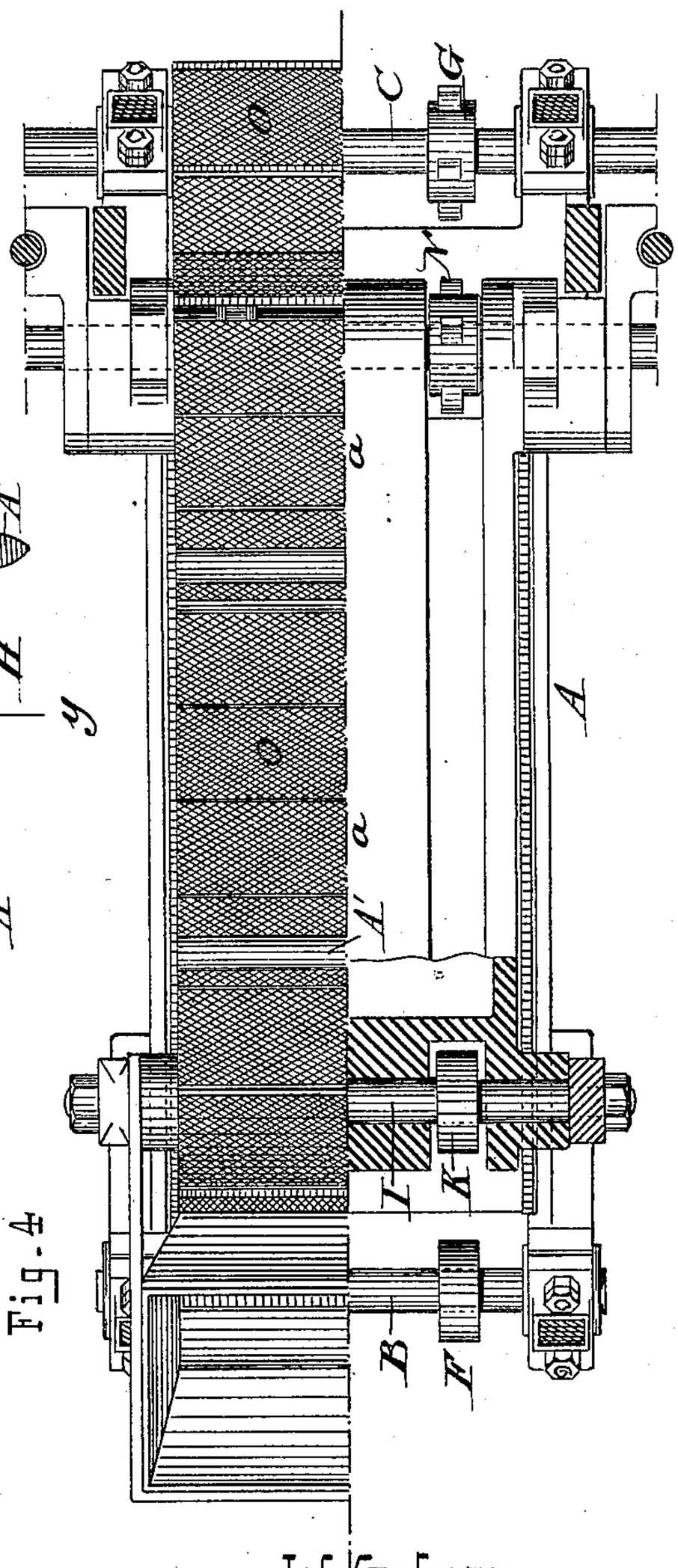


Fig. 4

WITNESSES=

J. C. Wilcke

P. A. Comiskey

INVENTOR=

John F. Gubbins

Dodger & Lan

attys.

(No Model.) 5 Sheets—Sheet 4.

J. F. GUBBINS.

Press.

No. 243,369. Patented June 28, 1881.

Fig. 5

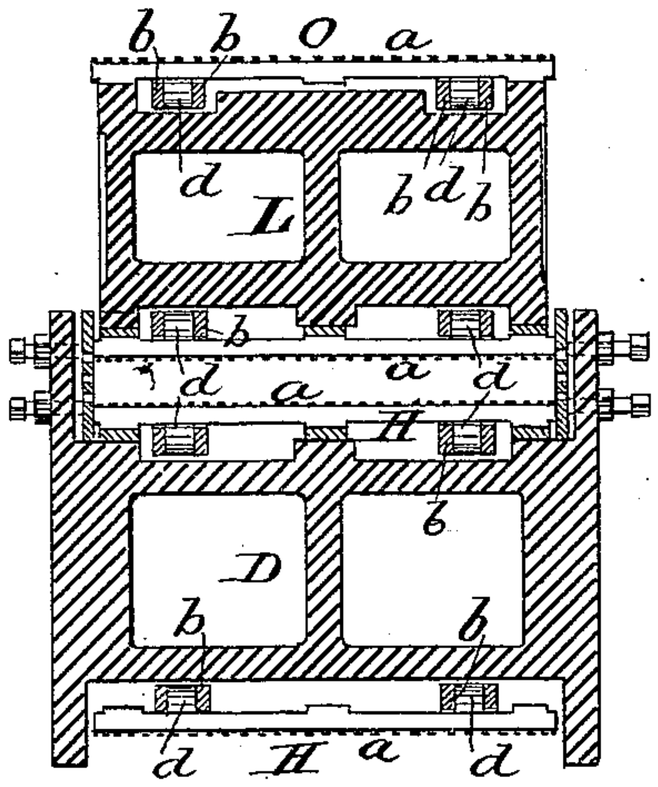


Fig. 6

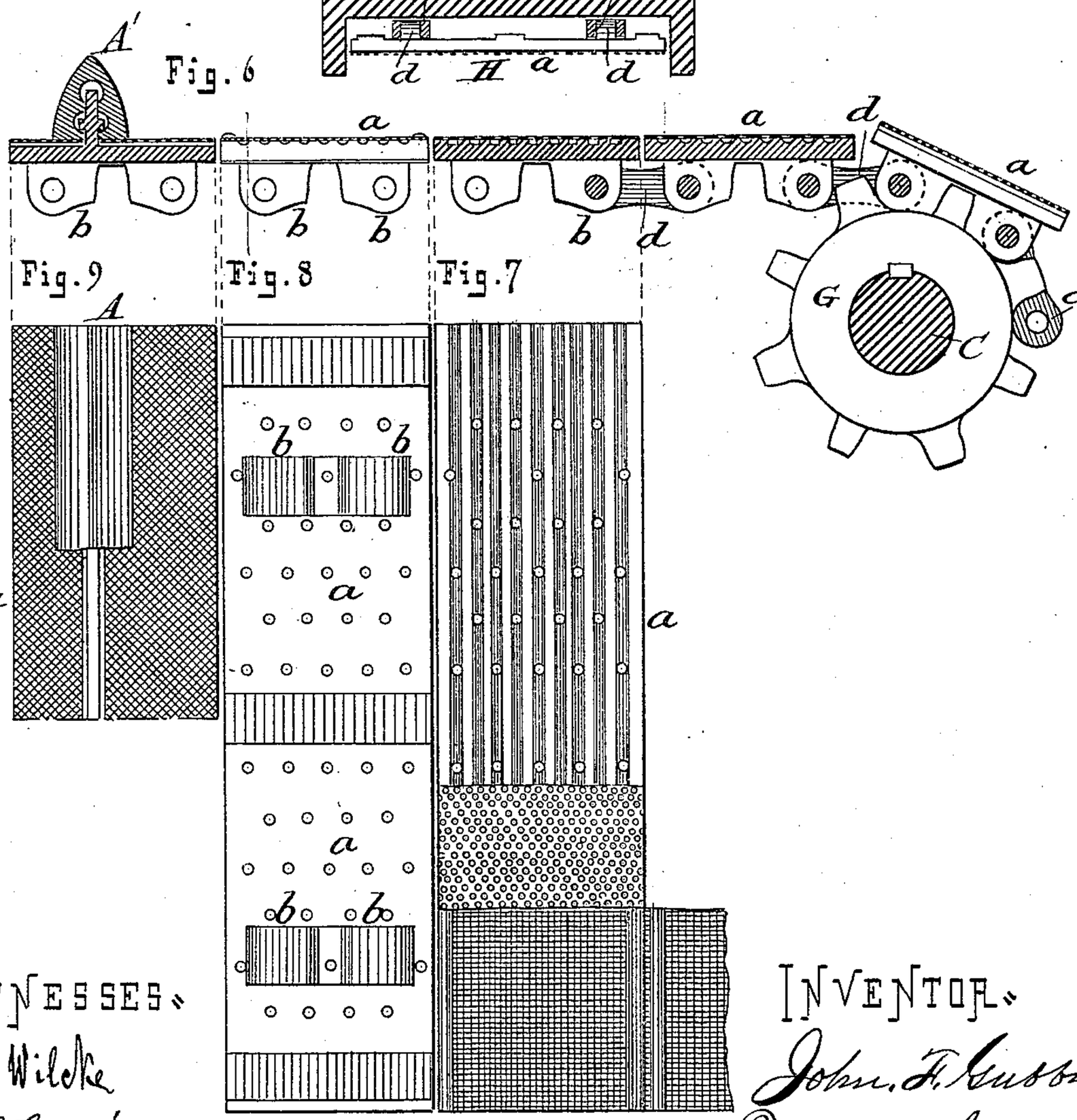


Fig. 9 Fig. 8 Fig. 7

WITNESSES:
J. C. Wilcke
C. H. Comiskey

INVENTOR:
John F. Gubbins,
Dodger & Ln
Attys.

(No Model.)

5 Sheets—Sheet 5.

J. F. GUBBINS.

Press.

No. 243,369. Patented June 28, 1881.

Fig. 12

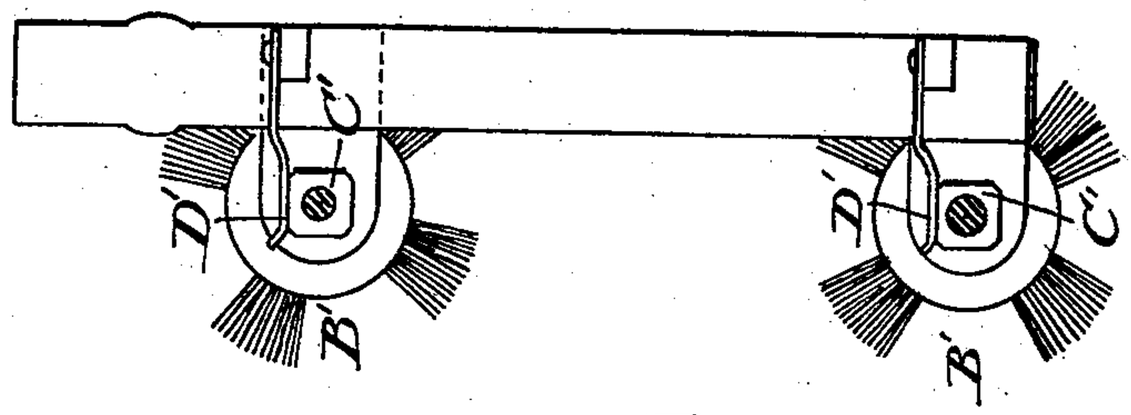


Fig. 11

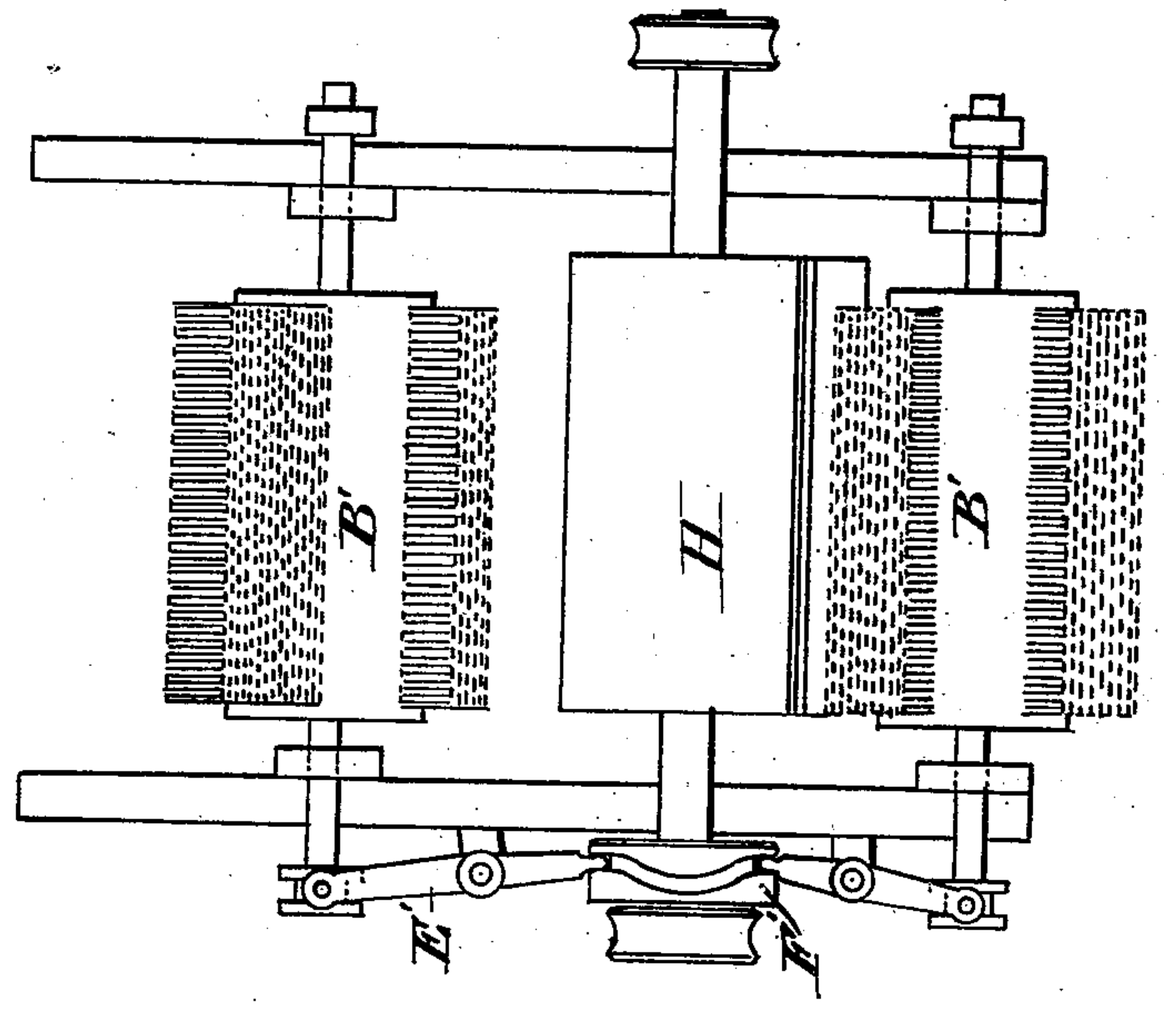
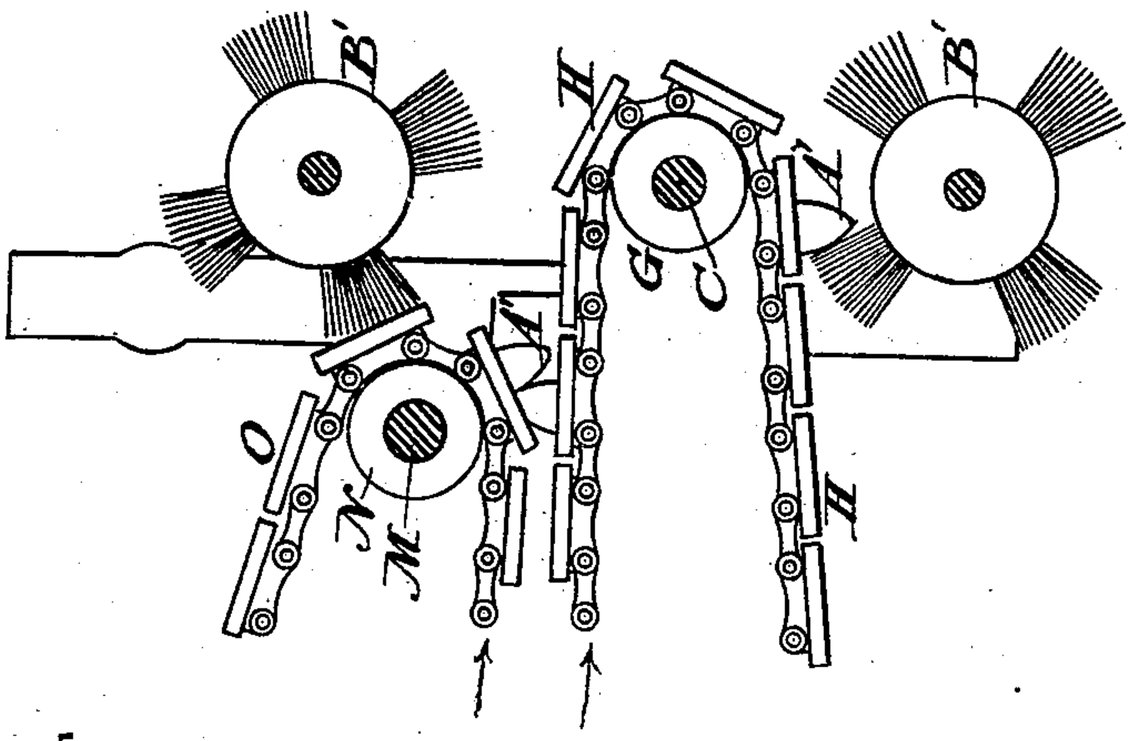


Fig. 10



WITNESSES:

J. C. Wicke

C. N. Comiskey

INVENTOR:

John F. Gubbins.

Dodgerdon Attys

UNITED STATES PATENT OFFICE.

JOHN F. GUBBINS, OF CHICAGO, ILLINOIS.

PRESS.

SPECIFICATION forming part of Letters Patent No. 243,369, dated June 28, 1881.

Application filed February 1, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. GUBBINS, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Presses, of which the following is a specification.

This invention relates to presses adapted for the compression of various materials, but more especially adapted for pressing the watery and greasy substance out of tank-offals, for pressing coagulated blood in the manufacture of fertilizers, &c.

The invention relates to a continuously-acting press composed, essentially, of two endless traveling belts, arranged to present a converging space for the passage of the material between them; and the invention consists in various peculiarities of construction, and, among others, in providing the belts with transverse yielding slats or ledges, which co-operate with the belts and side plates to form closed chambers or spaces to confine the material under pressure; in the peculiar construction and arrangement of a feed-hopper and valve; in the peculiar arrangement of brushes to clear the surfaces of the plates of the belts, and in various details of minor importance, which will be hereinafter described.

Referring to the accompanying drawings, Figure 1 represents an elevation of the delivery end of my press. Fig. 2 represents a side elevation of the press; Fig. 3, a longitudinal vertical section through the center of the operative parts; Fig. 4, a top-plan view, with one side shown in section on the line *x x*; Fig. 5, a vertical cross-section on the line *y y*; Figs. 6, 7, 8, and 9, detail views illustrating the construction of the carrying-belt; Fig. 10, a side elevation, illustrating the arrangement of the belts by which the chain surface is cleaned; Fig. 11, a top-plan view of the same; Fig. 12, an elevation from the opposite end of the same.

A represents a rigid base-frame, provided at the two ends with horizontal cross-shafts B and C, mounted in bearings thereon, and also provided at the middle, between the shafts, with a rigid horizontal bed-plate, D, preferably constructed in a hollow form, as shown. The shaft B is provided with smooth rolls F, and the shaft C provided with sprocket-wheels G. Around the pulleys F G, I pass an endless pressing-belt, H, extending over and lying upon the upper surface of the bed D and passing back beneath the same, as shown in the drawings. The endless belt H is composed, as shown in the drawings, of a series of transverse metallic slats or plates, *a*, which are provided on the rear side with ears or lugs *b*, and connected with each other by means of links *d*, pivoted to the lugs. The arrangement is such that the belt may be carried freely over the bed D by the pulleys, and that it may pass freely around the latter. The parts are so constructed that as the plates pass over the bed D they fit closely together at the edges, forming a continuous, unbroken traveling surface, which is sustained and supported firmly by the bed beneath.

At the forward end of the main frame it is provided with rigid uprights H′, which sustain the ends of a transverse shaft, I. This shaft is provided with pulleys K, and sustains one end of a horizontal swinging frame, L, the opposite end of which is provided with a cross-shaft, M, carrying pulleys N. The frame L extends in a substantially horizontal position above the lower belt, H, and is free to rise and fall at its rear end to a limited extent, swinging around shaft I as a center.

Around the pulleys K N of the upper frame I extends an endless belt, O, similar in construction to that of the lower belt, H, before described. This belt O travels upon and is prevented from bending upward by the lower straight face of the frame, or bed of the frame, L.

It will be seen that by depressing the rear end of frame L the upper surface of belt H and the lower surface of belt O may be given a greater or a less convergence toward each other as they approach the rear end of the frame, so that materials entering between the widely-separated beds of the belt at the front of the machine will be subjected to a gradual increasing pressure as they pass backward between the approaching surfaces of the belts.

For the purpose of imparting motion to the belt, I mount at the rear end of the main frame, on opposite sides thereof, two vertical shafts, P, providing the same with worms Q and R, which act upon worm-wheels S and S′, secured to the ends of the belt-driving shafts C and M, respectively. The vertical shafts are pro-

vided at their upper ends with beveled gears, and driven by corresponding gears mounted on the driving-shaft T, which is sustained horizontally in the top of the frame and provided with pulleys to receive a driving-belt.

By means of the worm-gear motion is communicated to the shafts C and M, which, in turn, through their respective sprocket-wheels, impart a positive motion to both belts, moving their adjacent faces backward in the same direction and at the same or substantially the same rate of speed.

In order that the upper belt may rise and fall freely without interference with the action of its driving-gear, the worms Q are mounted in boxes on the sides of the swinging frame L, and are arranged to slide up and down freely on the driving-shafts P, to which they are connected by feathers to prevent them from turning thereon.

For the purpose of preventing the material under treatment from escaping at the sides of the belts, I provide the main frame with vertical side plates, U, which fit closely against the sides or edges of the belts, bridging over the space between them, and which are adjustable by means of set-screws V, as shown in various figures.

For the purpose of delivering the material between the belts, I provide the main frame, at the front end of the machine, with an elevated hopper, W, the mouth of which delivers between the two belts, as shown.

In order that the material may not enter between the edges of the lower plates, the hopper is arranged to deliver thereon at a point at which the plates standing in a horizontal position fit closely against each other; and in order to prevent the material from working between the upper plates the hopper is provided with a deflector or guard-plate, X, curving inward beneath the upper plates, as shown. This guard-plate will be made of elastic material, or hinged, in order that it may be forced downward to permit the passage of certain transverse bars located on the face of the upper belt, as hereinafter described.

For the purpose of permitting the free passage of similar transverse bars on the lower belt, the mouth of the hopper is provided at the under side with a hinged plate or valve, Y, having a weighted counterbalance-arm, as shown, the latter intended to permit the valve to be moved upward readily against the weight of the superincumbent material.

In order to apply the required degree of pressure to the material, and at the same time permit the yielding of the parts in the event of the entrance of solid material between the belts, I connect the upper belt-supporting frame, L, with a weighted lever, Z, secured to the main frame, as shown. This lever bears directly upon the lugs or ears on the frame L, and is connected to the frame by links, as shown. The weight upon the lever is adjustable endwise thereon, in order that the pressure applied may be increased or diminished, as desired.

In treating various materials it is necessary that they should be confined closely in order to prevent their escape. For this reason, when required, I provide the bed-plates at suitable intervals with transverse raised ribs A′, of rubber or equivalent elastic material, which may be constructed and secured in any suitable manner. It is preferred, however, to construct these ribs with a groove or recess in the back, and to seat them over flanges cast upon the plates, as clearly shown in Fig. 6. The ribs of the two plates will be arranged to act upon or against each other, as indicated in Fig. 3, so as to form close partitions between the two belts, and thus divide the space between the belts into tight spaces or chambers, which chambers will be carried forward and gradually reduced in width by the movement of the belts.

When treating those materials which require close confinement—such as beet-root, which in other presses is ordinarily confined in sacks—I propose to cover the belt-plates with cloth, canvas, wire-gauze, finely-perforated sheet metal, or equivalent material, the plates being preferably grooved longitudinally beneath said material and perforated to permit the escape of the fluids.

For the purpose of removing adhering matter from the belts at the rear end of the machine, I provide for each belt a transversely-reciprocating brush, arranged to have an intermittent rotary motion for the purpose of permitting the passage of the transverse ribs A′.

As shown in Figs. 10, 11, and 12, the brushes B′ are mounted on transverse shafts at the rear end of the frame, and each consists of a cylinder provided with four longitudinal lines of bristles or equivalent material, with intervening spaces between. These lines of bristles are designed to act successively, one at a time, and the spaces between are designed to permit the passage of the slats A′, which, striking against one line of bristles, pass through the vacant space behind the same, and in this manner pass the brush, at the same time giving the brush a quarter-revolution and bringing the next line of bristles into an operative position. In order to hold the brush after each turn, it is provided at one end with a square hub, C′, upon which a spring, D′, acts, as shown. The cleansing action of the brushes is rendered effective by reciprocating them endwise, this being done through the medium of levers E′, which act upon collars on the ends of the brush-shafts, and which receive a vibratory motion from a slotted cam-wheel, F′, as shown.

The operation of the machine is as follows: The converging belts are carried continuously and positively in the direction indicated by the arrows. The material, being placed in the hopper W, passes downward between the belts and is carried forward between their converging surfaces, being thereby subjected to a grad-

ually increasing pressure, and being finally delivered at the rear end of the machine. The transverse strips A′ serve to retain the material and carry the same forward between the belts in a positive manner, and, acting in connection with the side plates, U, they form, in effect, close compression-chambers, in which the material is confined. The weighted connection of the upper belt-carrying frame causes a yielding pressure to be applied and admits of the belts separating in the event of their being subjected to an excessive strain.

While it is preferred to construct the machine in its details in the manner hereinbefore described, it is manifest that the details may be modified and altered in many respects which will readily suggest themselves to the skilled mechanic without departing from the limits of my invention. The form of the parts and the arrangement of the various details—such, for example, as the driving-gear—are matters of secondary importance.

It is obvious that the upper frame may be fixed rigidly in position in cases in which there is no danger of solid matter entering the press.

It is also obvious that the endless belts may be constructed of canvas, wood, or other suitable material whenever the nature of the material to be treated will admit thereof.

Having thus described my invention, what I claim is—

1. The combination, in a press, of two converging endless belts and sustaining-frames having flat continuous faces adapted and arranged to give each belt a direct support beneath its entire working-surface.

2. The combination, in a press, of two converging endless belts and two stationary side plates, arranged to cover or bridge over the space between the belts and fit snugly against the edges of the same, to prevent the lateral escape of the material between the belts.

3. The stationary frame D, having a flat continuous upper surface, and the sectional endless belt H, arranged to travel around said frame and upon its upper surface, in combination with the upper frame, L, having the continuous under surface, and the sectional belt O, arranged to travel around the same and against its under surface at an angle or inclination to the upper surface of the lower belt.

4. In combination with the two converging traveling belts, the elastic ribs or bars extending transversely across their faces.

5. The combination of the converging endless belts, the side plates, and the elastic ribs secured upon the faces of the belts, and arranged to co-operate with each other, as shown.

6. In a press, two converging endless belts, each having a straight surface from end to end, in combination with frames supporting the back of said belts and maintaining them in their straight forms when in action.

7. In combination with the belts having transverse ribs thereon, the hopper provided with a yielding mouth piece or pieces to permit the passage of the ribs, substantially as described and shown.

8. In combination with the ribbed belt and the hopper, the yielding valve Y.

9. In combination with the lower belt, the pivoted belt-carrying frame L and the weighted lever Z, acting thereon, as shown.

10. In combination with the fixed and the movable belt-frame provided with worm-wheels, the vertical shafts provided with the fixed and the movable worms, substantially as shown.

11. In combination with the belt-plates having raised metal flanges thereon, the rubber ribs or flanges fitting over and held by said flanges.

12. In combination with the endless belts having ribs thereon, the rotary brush, constructed substantially as shown, and adapted to be turned at intervals by said ribs.

13. In combination with the belt-plates, the longitudinally-reciprocating brushes, substantia'ly as shown.

14. In combination with the endless belt provided with ribs, the longitudinally-reciprocating and intermittently-rotating brushes, substantially as described.

15. In combination with the belt and the brushes having bristles and vacant spaces, alternated as shown, the levers E′, cams F′, and spring D′.

16. In combination with the endless belt having transverse ribs thereon, a rotary brush, constructed with longitudinal series of bristles and intermediate vacant spaces to permit the passage of the ribs, substantially as shown.

JOHN F. GUBBINS.

Witnesses:
FRED. BURKHART,
GERALD BARRY.