No. 633,359. Patented Sept. 19, 1899.

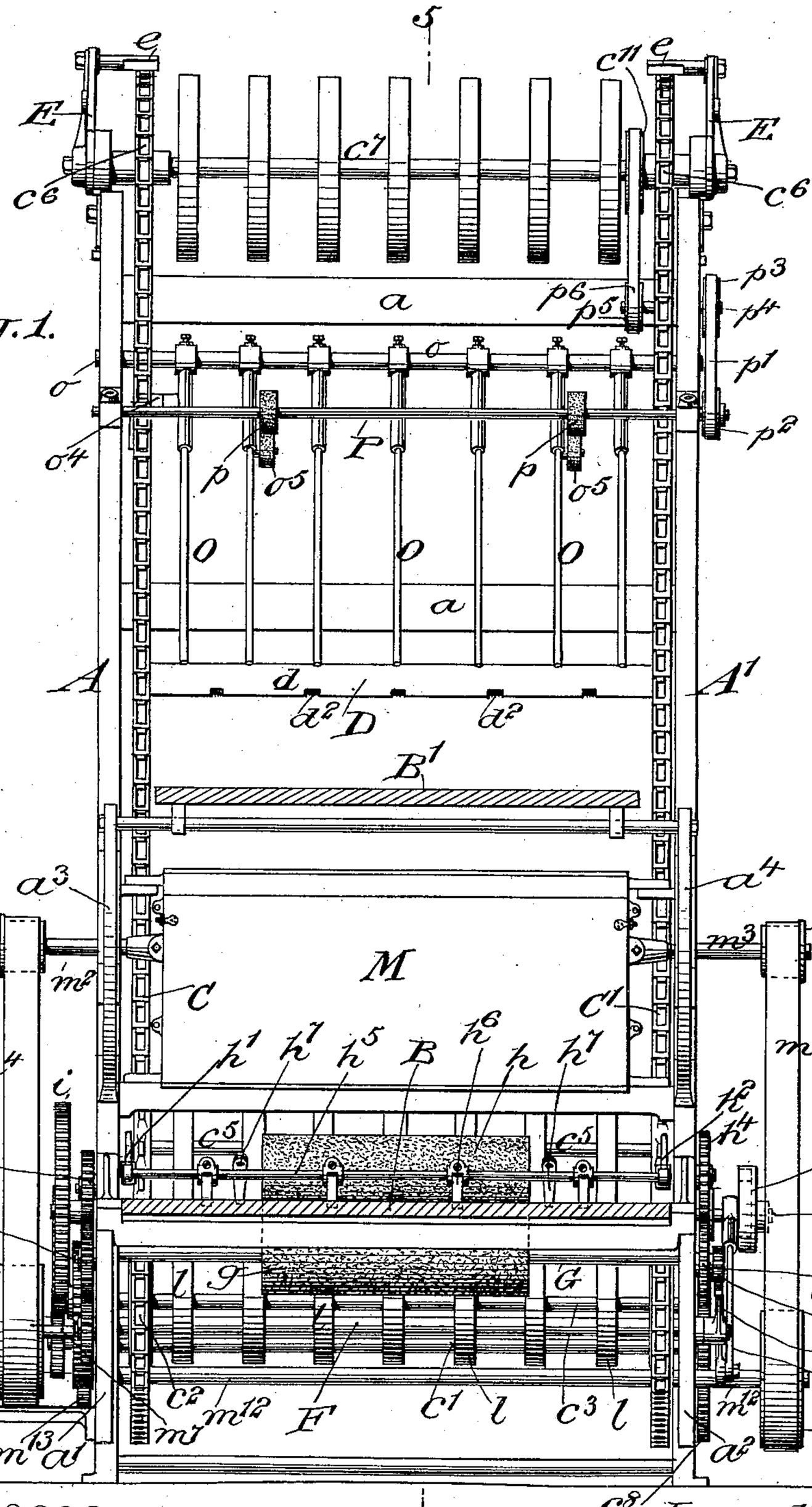
R. F. EMMERICH.

DUSTING MACHINE.

(Application filed Mar. 22, 1899.)

(No Model.) 5 Sheets—Sheet 1.

Fig. 1.



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(No Model.) 5 Sheets—Sheet 2.

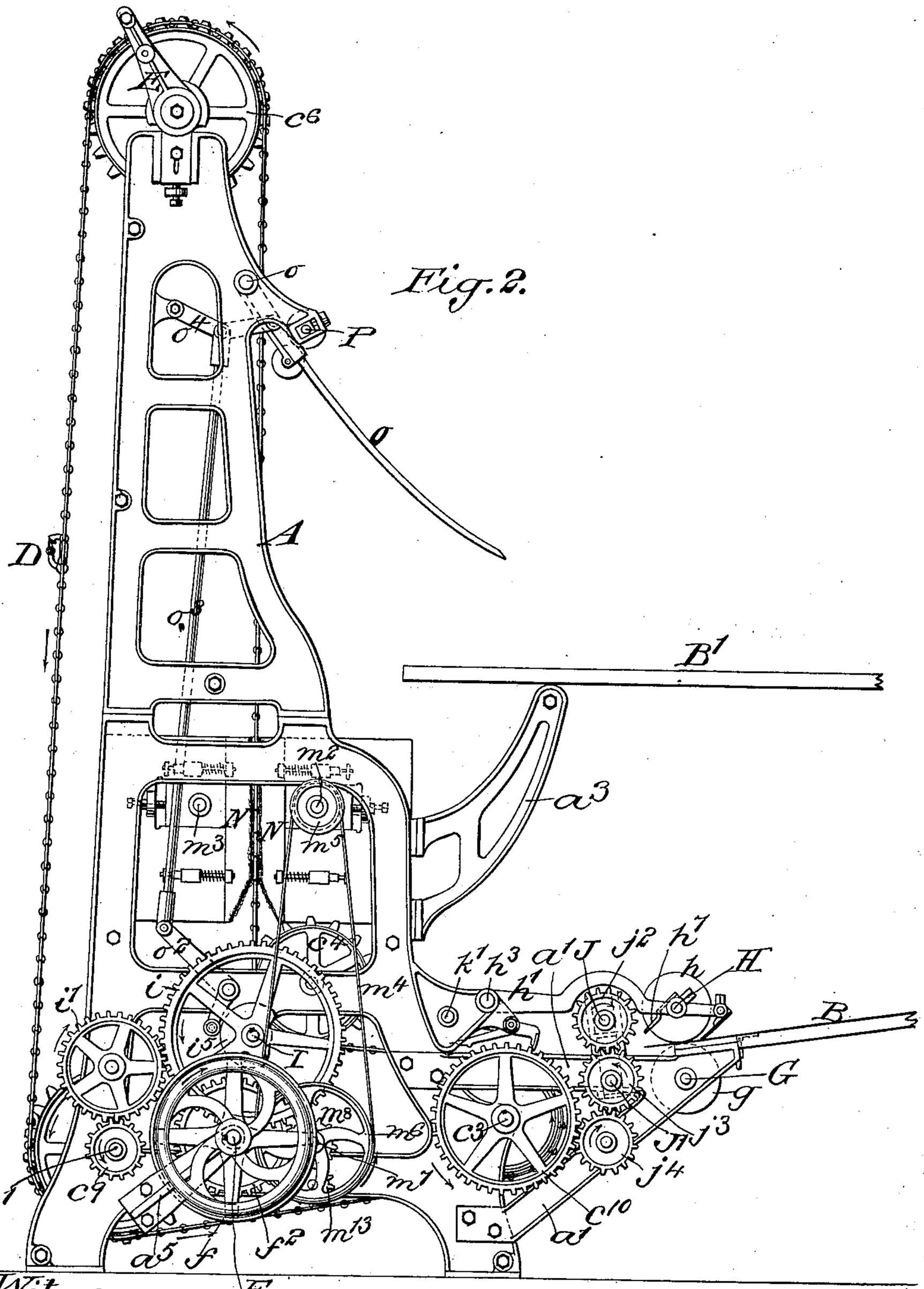

Fig. 2.

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(Application filed Mar. 22, 1899)

(No Model.) 5 Sheets—Sheet 3.

Fig. 4.

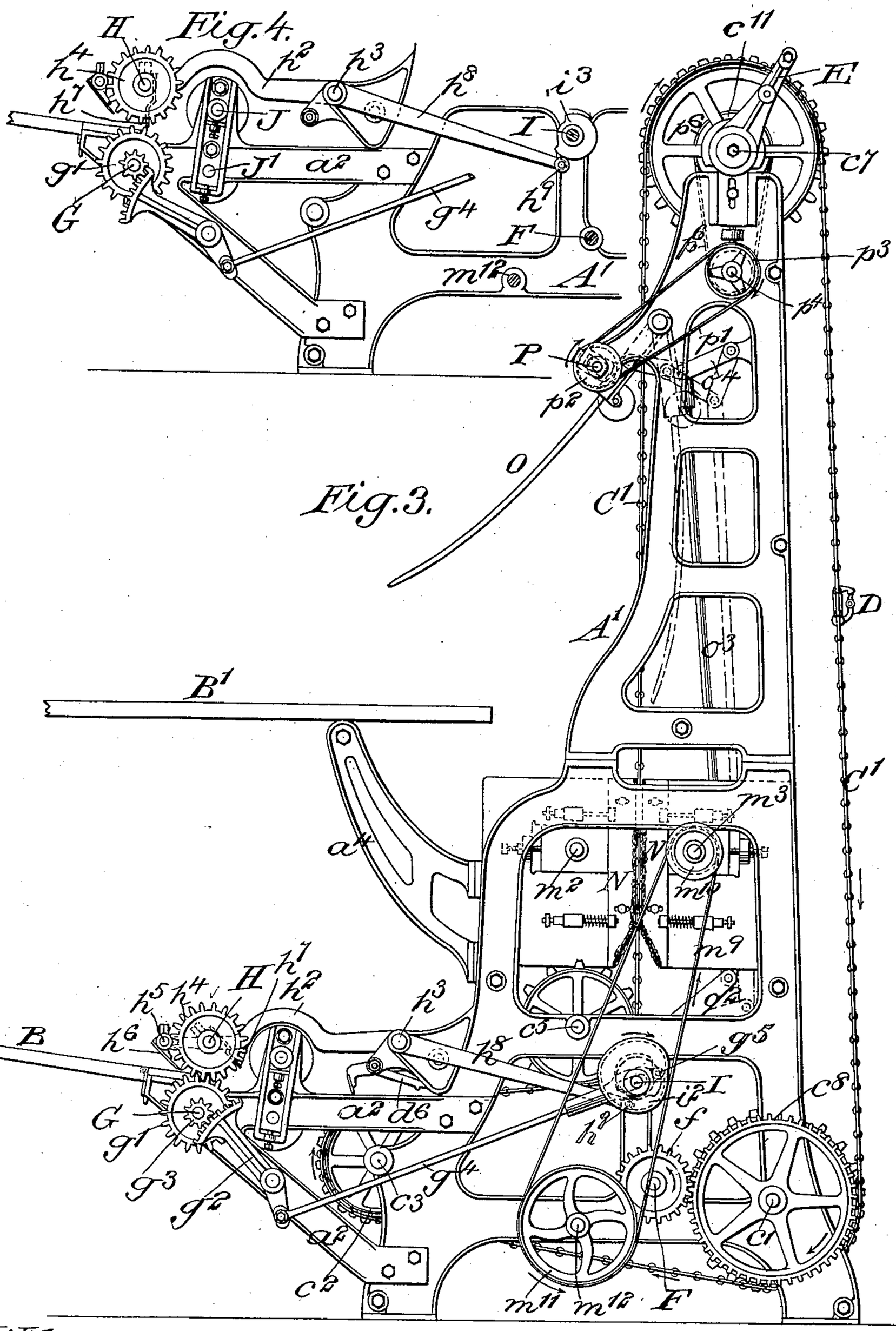

Fig. 3.

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No. 633,359. Patented Sept. 19, 1899.

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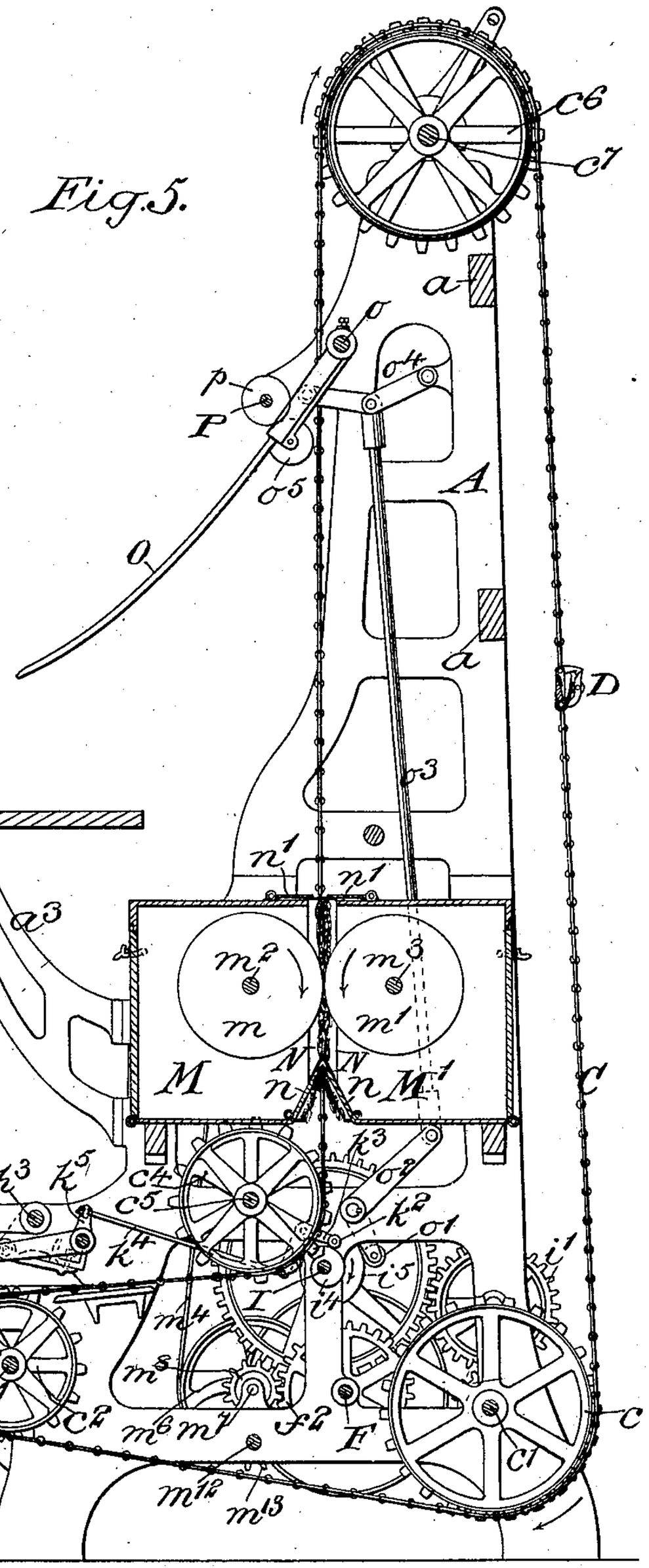
DUSTING MACHINE.

(Application filed Mar. 22, 1899.)

(No Model.) 5 Sheets—Sheet 4.

Fig. 5.



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No. 633,359. Patented Sept. 19, 1899.

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DUSTING MACHINE.

(Application filed Mar. 22, 1899.)

(No Model.) 5 Sheets—Sheet 5.

Fig. 6.

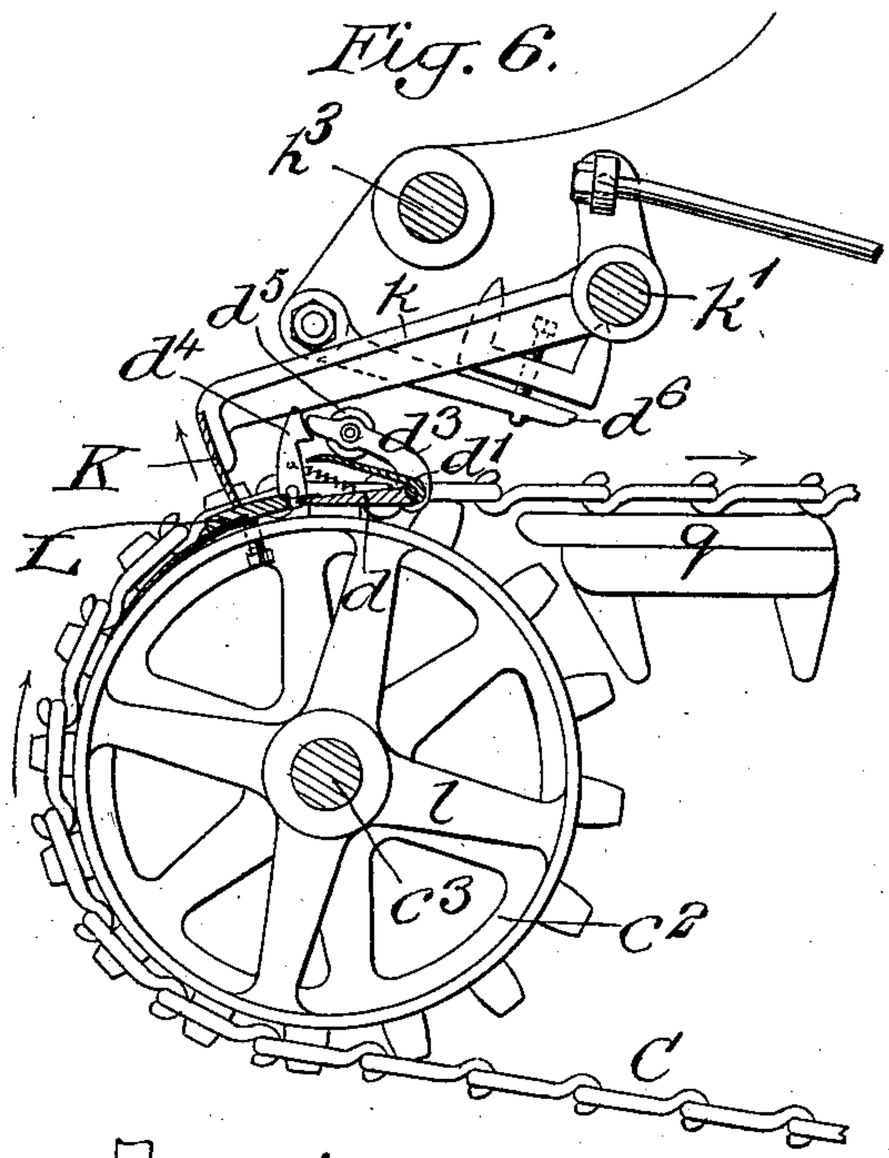


Fig. 7.

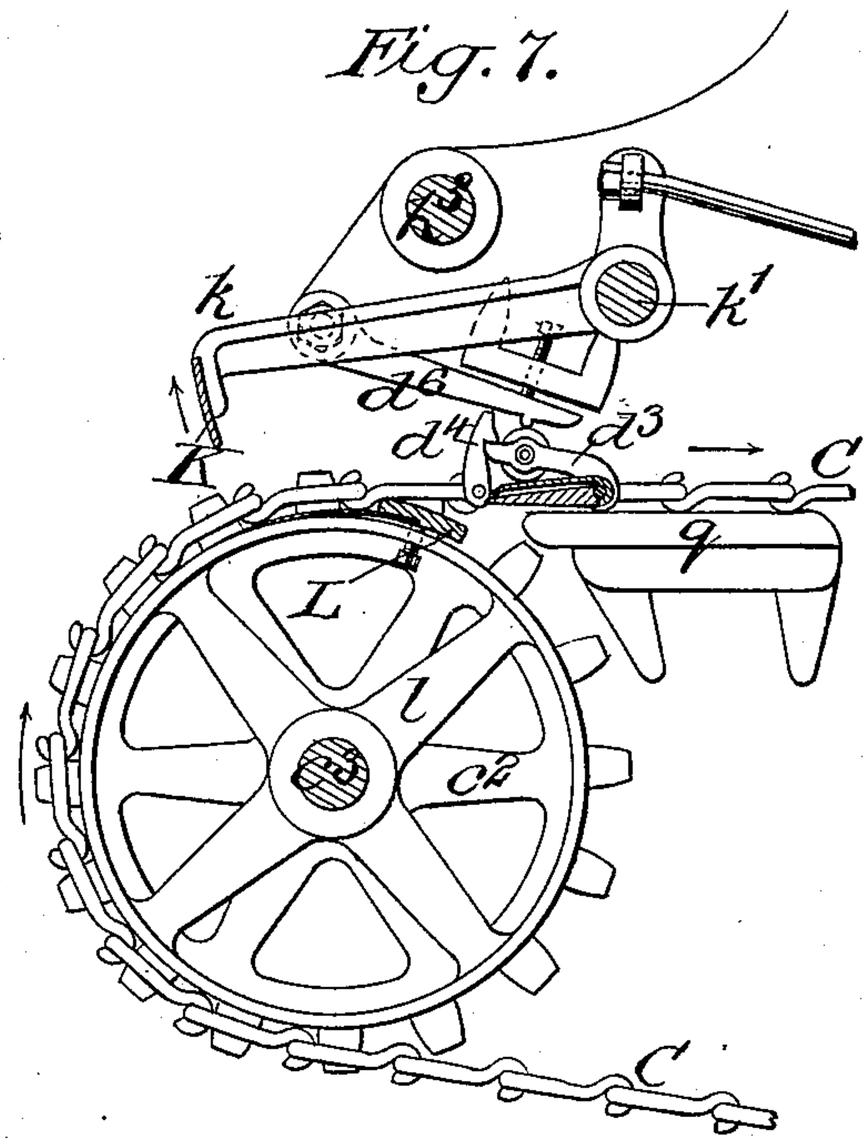


Fig. 8.

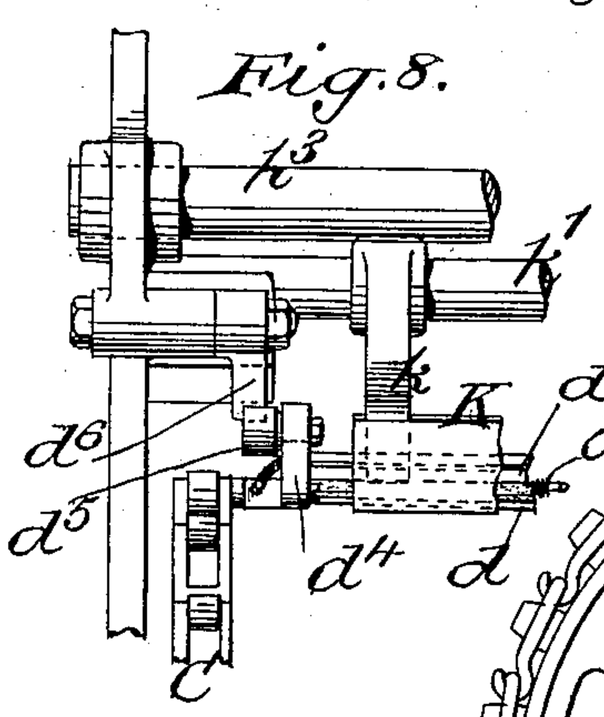
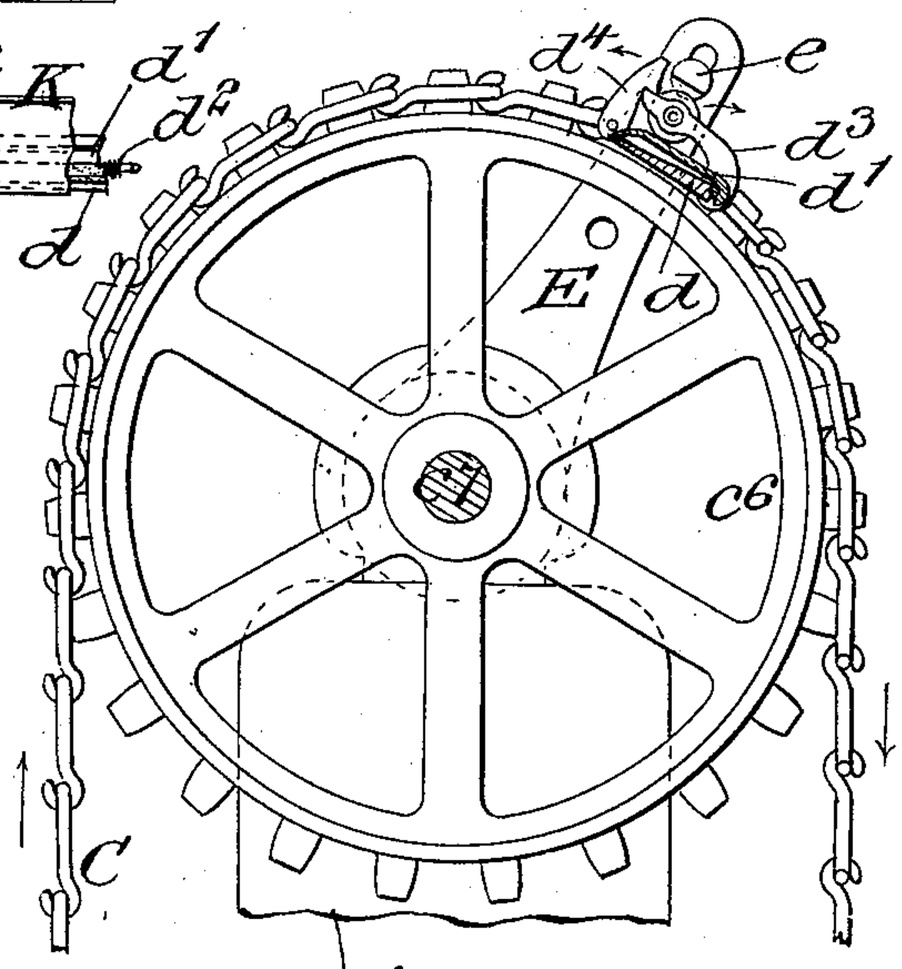


Fig. 9.



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UNITED STATES PATENT OFFICE.

RUDOLPH F. EMMERICH, OF NEW YORK, N. Y.

DUSTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 633,359, dated September 19, 1899.

Application filed March 22, 1899. Serial No. 710,052. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH F. EMMERICH, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented a new and useful Improvement in Dusting-Machines, of which the following is a specification.

This invention relates to certain improvements in dusting-machines in which the bronzed sheets after they have been fed into the machine are gripped by an endless carrier and drawn upwardly through a tight box or casing, where they are engaged by superfluous-bronze-removing rolls.

My invention contemplates means for alining the advance edge of the paper, means for rapidly advancing it to an endless carrier, means for causing the advance edge of the sheet to be accurately and smoothly grasped by clamps carried by the endless carrier, adjustable means for releasing the sheet after it has passed through the dusting-box, and means for positively and rapidly delivering the sheet from the machine after the sheet has been released.

My invention further contemplates the use of cutting mechanism located between the sheet-feeding mechanism and the endless carrier for severing the sheet into a plurality of smaller sheets.

My invention further contemplates means for rendering the dusting-box tight, so as to prevent the escape of the bronze therefrom.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a front view of the machine, a portion of the feeding and delivery tables being cut away. Fig. 2 is a view of the left side of the machine. Fig. 3 is a view of the right side of the machine. Fig. 4 is a detail view of a portion of the right side of the machine with the operating parts in a different position. Fig. 5 is a vertical section from front to rear through the machine, taken in the plane of the line 5 5 of Fig. 1, looking toward the left side of the machine. Fig. 6 is an enlarged detail view of an endless carrier and its adjacent parts, the sheet-clamp being represented as open and the bar for depressing and guiding the advance edge of the sheet into the clamp being shown in its lowered position. Fig. 7 is a similar view with the clamp represented as locked in its closed position and the sheet guide-bar in its raised position. Fig. 8 is a partial front view of the parts in the position shown in Fig. 6; and Fig. 9 is an enlarged detailed view of another portion of the endless carrier and its adjacent parts, showing the adjustable means for opening the clamp to release the sheet.

The side frames of the machine are denoted by A A′, which frames are rigidly spaced apart by means of suitable cross-beams *a*. The side frames are provided at their bases with forwardly-extended brackets a' a^2, to the free end of which is secured the feed-table B. The side frames are further provided at points above the brackets a' a^2 with brackets a^3 a^4, which support one end of the delivery-table B′.

An endless carrier for the sheets to be dusted is located between the side frames, and in the present instance consists of a pair of chains C C′, each of which chains passes around a drive-sprocket *c*, mounted on a cross-shaft c' at the base of the machine near its back, an idler-sprocket c^2, mounted on a cross-shaft c^3 at the front of the frame near its base, an idler-sprocket c^4, mounted on a cross-shaft c^5 a short distance to the rear above the shaft c^3, and a sprocket-wheel c^6, mounted on a cross-shaft c^7, located at the top of the machine. The endless carrier is provided with one or more clamps D for grasping the advance edge of the sheet to be dusted, each of which clamps comprises a stationary jaw *d*, which extends across the machine between the side chains C C′, and a spring-actuated hinged jaw d', which also extends across the machine between the said chains. The spring d^2 exerts its force in a direction to normally hold the jaws apart. Each end of the clamp is provided with means for locking the jaws in their closed position, which means comprises a swinging latch d^3 and a spring-actuated dog d^4, arranged in position to slip by the end of the latch d^3 when the said latch is depressed. The latch d^3 may be provided with a suitable roller d^5. This roller is depressed by an adjustable arm d^6, hinged to the side frame at a point just above the shaft c^3, the said arm being extended rearwardly, so that the clamp is caused to close as it leaves the

sprocket-wheels c^2. The clamp is positively opened to release the advance edge of the machine after the sheet has been dusted in the following manner: An arm E is mounted on the shaft c^7, the free end of the said arm projecting slightly beyond the periphery of the sprocket-wheel c^6 and being there provided with an inwardly-extended pin e. This arm can be clamped in any desired rotary adjustment. This pin e is fitted to engage the top of the spring-actuated dog d^4 and swing it back sufficiently to release the latch d^3, and thereby the swinging jaw d'.

The main drive-shaft F of the machine is mounted in suitable bearings in the side frames A A' and also in the end of a bracket a^5, extended outwardly from the side frame A. This shaft is provided with a suitable drive-pulley f, which may be driven from a source of power. (Not shown.) The drive-shaft F is provided with a gear-wheel f' on its end exterior to the side frame A', which meshes with a gear-wheel c^8, fixed on the sprocket-shaft c', so as to impart a rotary movement to the sprockets c for driving the endless carrier. A rotary friction driving-roll g is fixed to a shaft G, mounted in stationary bearings in the brackets a' a^2 at the end of the feed-table B. A second friction driving-roll h is fixed to a shaft H, mounted in the outer ends of a pair of swinging arms h' h^2, which arms are fixed to a rock-shaft h^3, mounted in the side frames A A'. The friction driving-roll h is thus mounted so as to be swung toward and away from the roll g. The rotary movement of the roll g is imparted to the roll h in a direction to feed the paper from the feed-table into the machine when the roll h is in its lowered position by means of gears g' h^4. The arms h' h^2 are extended forwardly a slight distance beyond the roll h and are there provided with a cross-bar h^5, on which are mounted a plurality of inclined guiding-fingers h^6 for directing the advance edge of the sheet to be dusted between the rolls. The means which I employ for alining the advance edge of the sheet while the roll h is raised consists of a plurality of stops h^7, fixed to the shaft H and projecting a slight distance beyond the periphery of the roll h, the said stops being so arranged that when the roll is raised the said stops will be swung down into a position to be engaged by the advance edge of the sheet as it is slid forward by the operator into position between the two feeding-rolls. A rotary cam-shaft I is mounted in the side frames A A'. A rotary movement is imparted to the said cam-shaft I by means of a gear c^9, mounted on the drive sprocket-shaft c', a gear i, fixed on the shaft I, and an intermediate gear i', which intermeshes with the gears c^9 and i. The means which I employ for producing an alternate forward and backward rotary movement to the roll g consists of a rocking sector-rack g^2, mounted on the bracket a^2, which sector-rack intermeshes with a pinion g^3, fixed to the shaft G of the said roll. The sector-rack g^2 is provided with a connecting-rod g^4, which is provided with a stud or roller g^5, which is engaged by a cam i^2, fixed on the cam-shaft I. The means which I employ for rocking the shaft h^3, and thereby raising and lowering the friction-roll h, comprises a rearwardly-extended arm h^8, fixed to the rock-shaft h^3 and provided with a stud or roller h^9, engaged by a cam i^3, fixed to the cam-shaft I.

A cutting mechanism is mounted to the rear of the sheet-advancing rolls for use in severing the sheet into a plurality of smaller sheets. This cutting mechanism comprises upper and lower rotary shafts J J', mounted in adjustable bearings in the brackets a' a^2, so that they may be adjusted bodily up and down and also toward and away from each other. These shafts are provided with one or more pairs of cutting-disks j j' in engagement with each other. The rotary shafts J J' are provided with intermeshing gears j^2 j^3. A rotary movement is imparted to the gear j^3 by means of an intermediate gear j^4, which intermeshes with the gear j^3 and also with a gear-wheel c^{10}, fixed on the sprocket-shaft c^3.

The operation of the several parts is so timed that a clamp D comes into the position shown in Fig. 6 as the sheet is fed forward by the sheet-advancing rolls. To insure the even and positive grasping of the entire advance edge of the sheet by the clamp, I provide a guide-plate K, which extends across the machine above the sprockets c^2, which guide-plate is mounted in the free ends of swinging arms k, fixed to a rock-shaft k', mounted in the side frames A A'. This plate is arranged to coact with a cross-plate L, which extends across the machine between the sprockets c^2, which plate L is adjustably secured to the peripheries of a plurality of intermediate wheels l, fixed to the shaft c^3.

A pair of superfluous-bronze-removing rolls m m' are fixed to rotary shafts m^2 m^3 in position to engage the faces of the sheet as it is drawn through the dusting-box. These shafts m^2 m^3 are suitably mounted in adjustable bearings carried by the dusting-box. The front shaft m^2 is driven by means of a belt m^4, leading from a pulley m^5, fixed to the shaft m^2, to a pulley m^6, fixed to a shaft m^7, which shaft m^7 is geared to the main drive-shaft F by means of a pinion m^8, which intermeshes with a gear f^2. The rear shaft m^3 is driven in the reverse direction to the shaft m^2 by means of a belt m^9, which leads from a pulley m^{10}, fixed to the shaft m^3, to the pulley m^{11}, fixed to a shaft m^{12}. This shaft m^{12} is driven by means of a pinion m^{13}, which intermeshes with a pinion m^8 on the shaft m^7.

The dusting-box is rendered tight to prevent the escape of the bronze as it is being dusted from the sheet by spacing the adjacent edges of the sections M M' apart, providing spring-actuated sliding shutters N along the side edges of the box and hinged

doors n n' along the bottom and top edges of the box. The bottom doors n extend upwardly into the interior of the box and are provided with flexible meeting edges and depend upon gravity or springs for keeping them normally closed. The upper pair of doors n' are also provided with flexible meeting edges and are arranged so that they normally close by gravity or springs. The edges of the spring-actuated shutters are provided with some yielding material—such, for instance, as fur—to still further insure the retention of the bronze-dust within the box.

A plurality of swinging delivery-arms O are fixed to a cross rock-shaft o, mounted in the side frames A A' at points just inside the front portion of the carrier-chains and at a considerable distance above the dusting box

tively feed the sheet through the cutting mechanism into position to be engaged by one of the clamps D on the endless carrier. The movement of the swinging guide-plate K is so timed that as the advance edge of the sheet approaches the open clamp the said plate is swung downwardly, thereby engaging the face of the sheet near its advance edge and accurately guiding it into its position between the jaws of the clamp. As the endless carrier moves along, the swinging jaws will be caused to close to firmly grip the advance edge of the sheet by means of the engagement of the arm d^6 with the roller d^5 on the latch d^3, carried by the swinging jaw. As the sheet is drawn along by the endless carrier it is drawn vertically through the dusting-box, where both

swinging support therefor, paper-alining stops carried by the last-named roll, means for swinging one of the rolls away from the other and means for swinging the stops down into the plane of the space between the rolls, substantially as set forth.

3. A dusting-machine comprising a suitable frame, a pair of paper-advancing rolls, a stationary support for one of the rolls, a swinging support for the other of the rolls, a rotary cam-shaft mounted in the frame for imparting to the rolls an alternate forward and backward rotary movement and for swinging one of the rolls into and out of geared engagement with the other roll, substantially as set forth.

4. In a dusting-machine, a suitable frame, an endless carrier mounted to travel therein, clamps carried by the carrier, means for feeding a sheet to the clamp and means for positively directing the advance edge of the sheet into engagement with one of the clamps comprising a swinging plate arranged to engage the face of the sheet and guide the said advance edge into the clamp, substantially as set forth.

5. In a dusting-machine, a suitable frame, an endless carrier mounted to travel therein, clamps carried by the said carrier, means carried by the frame for closing the jaws of the clamp, a catch carried by the clamp in position to lock the jaws in their closed position and means carried by the frame in position to trip the catch to permit the jaws of the clamp to open, substantially as set forth.

6. In a dusting-machine, a suitable frame, a dusting-box carried thereby comprising two sections, an endless carrier arranged to draw the sheet to be dusted between the said sections of the box, the said box being provided with means for closing the top, bottom and sides thereof for preventing the escape of the bronze, substantially as set forth.

7. A dusting-box comprising two sections having swinging doors arranged to close the top and bottom of the box and sliding shutters arranged to close the sides of the box, substantially as set forth.

8. In a dusting-machine a suitable frame, a sheet-delivering device comprising one or more rotary friction delivery-rolls, mounted in the frame, a plurality of swinging delivery-arms hinged to the frame, one or more idle friction-rolls carried by the said arms opposite the one or more of the first-named friction delivery-rolls, whereby, as the delivery-arms are swung forward the said rolls are caused to rotate in unison, substantially as set forth.

9. In a dusting-machine, a suitable frame, an endless carrier, a sheet-advancing mechanism, mechanism for causing the advance edge of the sheet to be engaged by the endless carrier, a sheet-delivery mechanism and a rotary shaft arranged to control the movements of the sheet-advancing mechanism, the mechanism for causing the advance edge of the sheet to be engaged by the endless carrier and the sheet-delivery mechanism, substantially as set forth.

10. In a dusting-machine, a suitable frame, an endless carrier mounted therein, a dusting-box, a sheet-grasping clamp carried by the endless carrier and an adjustable clamp-releasing means whereby the sheet may be released at greater or less distances from the dusting-box, substantially as set forth.

11. In a dusting-machine, a suitable frame, an endless carrier arranged to engage the advance end of a sheet to draw the sheet through the machine, means for releasing the advance end of the sheet at a predetermined point and means arranged to engage the rear portion of the sheet for positively delivering the sheet from the machine as its advance end is released from the endless carrier, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed by name, in presence of two witnesses, this 17th day of March, 1899.

RUDOLPH F. EMMERICH.

Witnesses:
FREDK. HAYNES,
EDWARD VIESER.