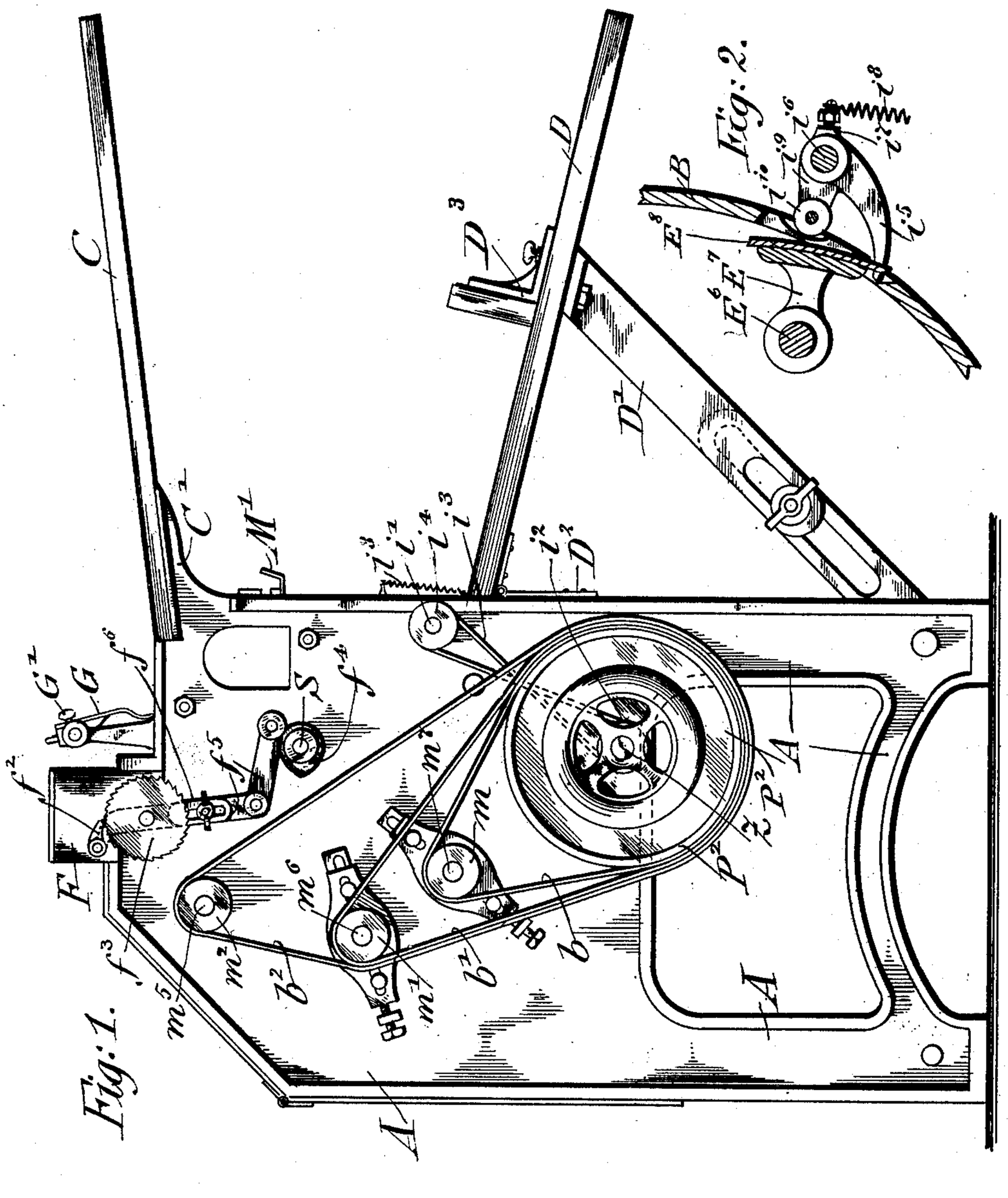
No. 756,786. PATENTED APR. 5, 1904.

M. FRITSCHE.

BRONZING MACHINE.

APPLICATION FILED SEPT. 11, 1903.

NO MODEL. 4 SHEETS—SHEET 1.



WITNESSES

John J. Kittle

C. F. Goepel

BY

INVENTOR

Max Fritsche

Glover Niles

ATTORNEYS.

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NO MODEL. 4 SHEETS—SHEET 2.

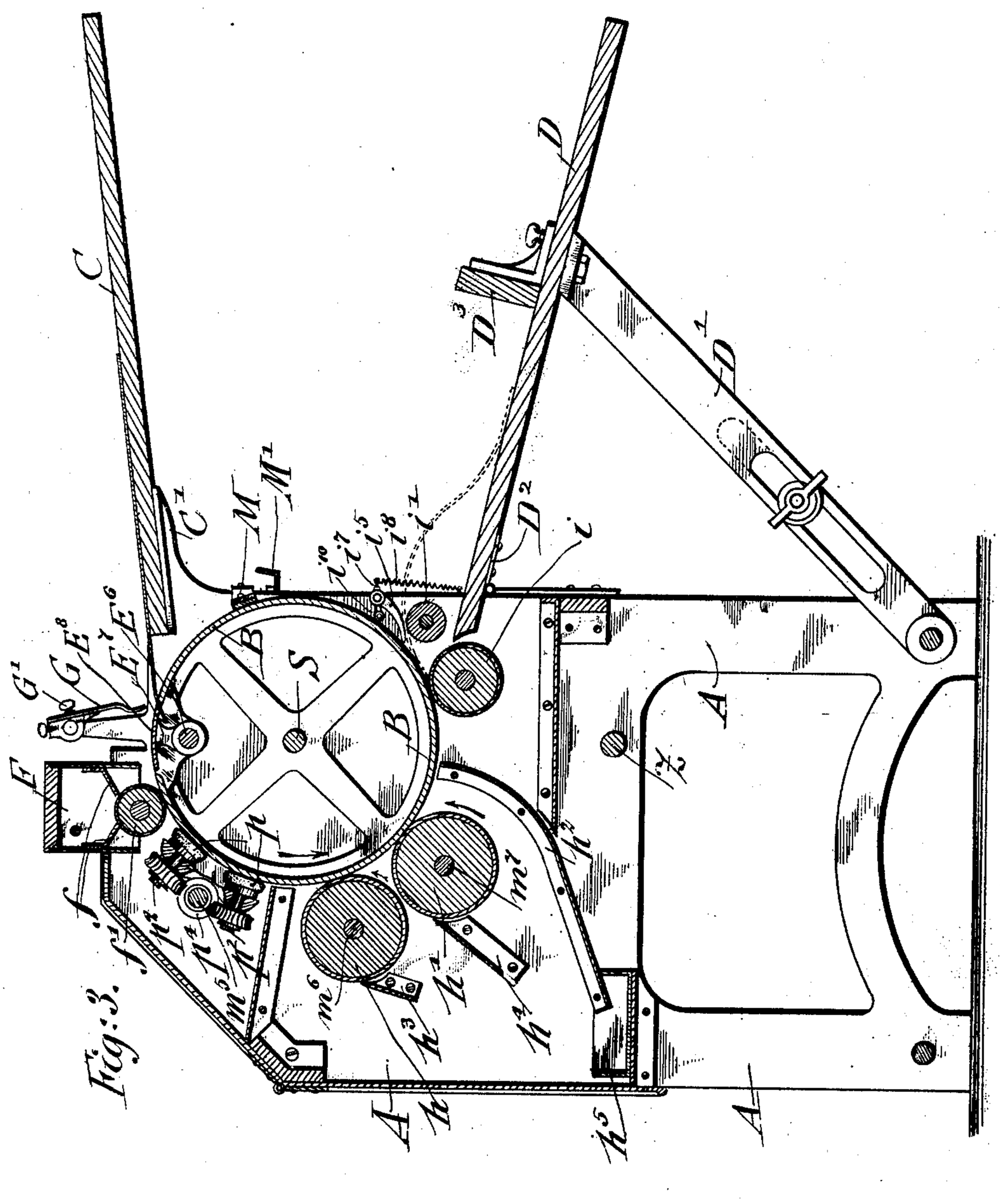

Fig. 3.

WITNESSES

E. Pyrene

John J. Kittle

INVENTOR

Max Fritsche

BY

Gomer Niles

ATTORNEYS

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M. FRITSCHE.

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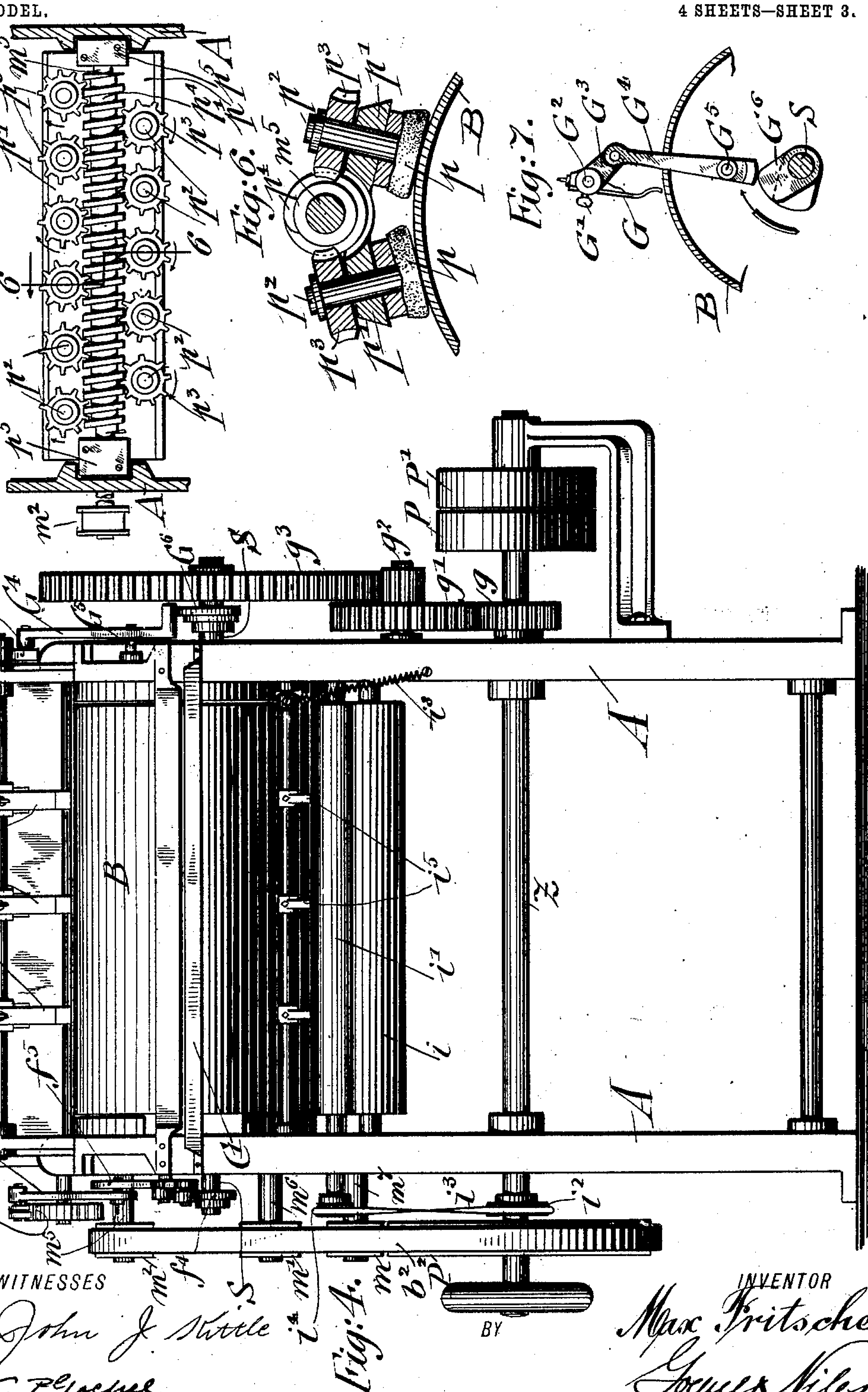

WITNESSES

John J. Kittle

C. P. Goepel

INVENTOR

Max Fritsche

BY

Goepel & Niles

ATTORNEYS

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NO MODEL. 4 SHEETS—SHEET 4.

Fig: 9.

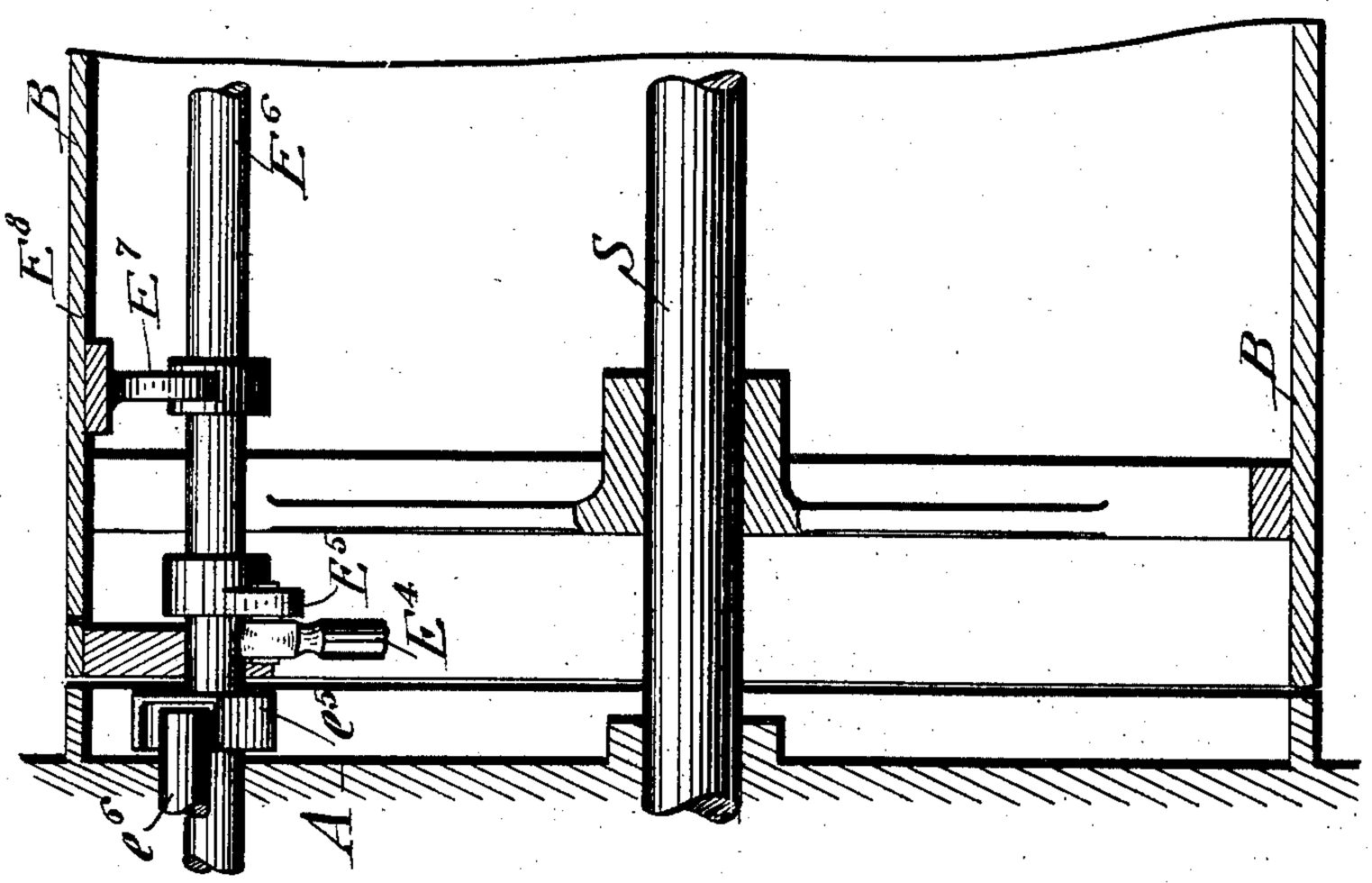
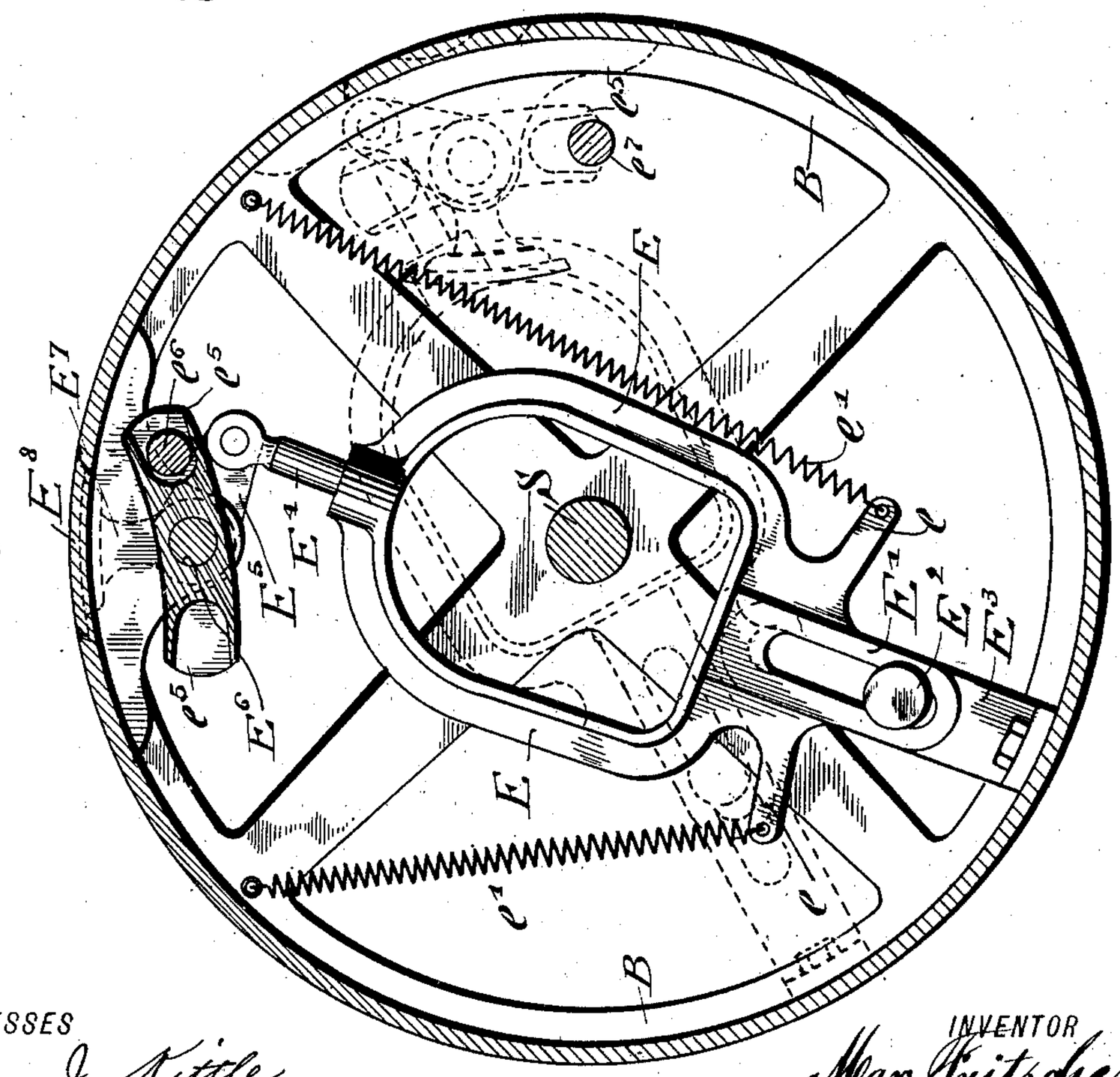


Fig: 8.



WITNESSES

John J. Kittle

C. Hoeve

INVENTOR

Max Fritsche

BY

Howson & Sons

ATTORNEYS

No. 756,786. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

MAX FRITSCHE, OF CARLSTADT, NEW JERSEY, ASSIGNOR TO JOSEPH A. KAPP, OF NEW YORK, N. Y., AND LOUIS HENGSTLER, OF WEEHAWKEN, NEW JERSEY, COMPOSING THE FIRM OF ROBERT MAYER & CO., OF NEW YORK, N. Y.

BRONZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 756,786, dated April 5, 1904.

Application filed September 11, 1903. Serial No. 172,832. (No model.)

To all whom it may concern:

Be it known that I, MAX FRITSCHE, a citizen of the United States, residing in Carlstadt, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Bronzing-Machines, of which the following is a specification.

This invention relates to certain improvements in bronzing-machines which are intended to produce the bronzing of paper or other material in an effective and uniform manner, to collect and return the excessive bronze-powder for later use, and to produce the reliable stripping of the paper from the cylindrical sheet-carrier after the bronzing is completed; and the invention consists of a bronzing-machine which comprises the combination, with a sheet-carrier and delivery-roll, of stripping-fingers arranged at the outgoing end of the delivery-roll and operated at the proper time so as to produce the stripping of the sheet from the sheet-carrier and delivery of the same to the delivery-board; and the invention consists, lastly, of certain additional details of construction and combinations of parts, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of my improved bronzing-machine. Fig. 2 is a detail section, drawn on a larger scale, of the mechanism for stripping the sheet and delivering it from the cylindrical sheet-carrier. Fig. 3 is a vertical longitudinal section of the bronzing-machine. Fig. 4 is a front elevation of the same with the feed-table and delivery-board removed, so as to show the parts behind the same. Fig. 5 is a detail side view of the mechanism for imparting independent rotary motion to the bronzing-pads. Fig. 6 is a vertical transverse section on line 6 6, Fig. 5, drawn on a larger scale. Fig. 7 is a detail side view of the guide-fingers which serve for preventing more than one sheet to pass to the sheet-carrying roll. Fig. 8 is a vertical transverse section through the cylindrical sheet-carrier, showing the gripper mechanism; and Fig. 9 is a vertical longitudinal section of a portion of the mechanism shown in Fig. 8.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A represent the side frames or standards of my improved bronzing-machine. In suitable bearings at the upper part of the standards A A is supported the shaft S of a rotating sheet-carrying cylinder B. A slightly-inclined feed-table C is mounted upon forwardly-extending brackets C′ of the side standards A A, its edge being in close proximity to the sheet-carrying cylinder B. This feed-table is adapted to support the sheets of paper or other material which is intended to be bronzed in the machine.

Motion is transmitted to the different operative parts of the machine from a driving-shaft Z, which is journaled in bearings of the side frame A and which is provided with fast and loose pulleys P P′ at the outer end of the shaft, exterior to the standards A of the machine. The driving-shaft Z transmits motion by several belts b b' b^2, which are stretched over a pulley P^2 on the same, to smaller pulleys m, m', and m^2 at the ends of the shafts of the different operative parts of the machine. Continuous rotary motion is transmitted from the driving-shaft Z by intermediate gear-wheels g g' g^2 g^3 to the shaft S of the sheet-carrying cylinder B, as shown in Fig. 4.

The sheet-carrying cylinder B is provided with a paper-gripping mechanism for engaging the end of the sheet to be bronzed when passing it from the feed-table C onto the surface of the sheet-carrying cylinder for holding it thereon. This paper-gripping device consists of the rock-shaft E, which is located at the interior of the cylinder B, on which rock-shaft are arranged a number of outwardly-extending arms e to which springs e' are attached, which in turn are secured to the sheet-carrying cylinder B. One end of the rock-shaft E is provided with a slotted arm E′, which is guided by a lug E^2 of a piece E^3, secured to the cylinder B. To the other end of the rock-shaft E is applied a rod E^4, attached to a crank-arm E^5, which is in turn secured to a shaft E^6. Connected to the shaft E^6 is an

arm E^7, to which a gripper-plate E^8 is secured, which plate forms a part of the circumference of the cylinder B. The shaft E^6 is further provided with an inclined cam e^5, which is adapted to engage studs e^6 e^7 upon the side standard A as the cylinder is rotated, whereby the gripper or gripper-plate E^8 is positively opened against the tension of the spring-actuated rock-shaft E for permitting the gripper to receive the edge of the paper as it is fed forward from the feed-table C. The studs e^6 e^7 are secured to the standard A at a point in position to be engaged by the cam e^5 on the shaft of the gripper for opening the gripper at the proper time to permit the sheet to be discharged and for closing the gripper at the proper time for holding the paper to be bronzed.

At the ingoing end of the feed-table C are arranged guide-fingers G, which serve for the purpose of preventing more than one sheet to pass onto the sheet-carrying cylinder. The guide-fingers G are adjustably supported by screws G′ on a rod G^2, to one end of which a crank G^3 is secured, on the free end of which a rod G^4, pivoted at G^5 and actuated by a cam G^6, secured to the shaft S, acts. Adjacent to the guide-fingers G is arranged a bronze-fountain F, which is closed at the top and provided with a hopper-shaped bottom f, that serves to feed the bronze onto a roller f', that is covered with felt or other suitable material, so as to take up the bronze-powder onto said roller and deliver it to the sheet fed by the sheet-carrying cylinder B below the same. Intermittent rotary motion is imparted to the bronze-supplying roller f' by a pawl f^2 and ratchet f^3 on the shaft of the roller, which are operated by a cam f^4 on the shaft S of the sheet-carrying cylinder. The cam f^4 acts on a fulcrumed elbow-lever f^5, adjustably connected with a slotted rod f^6, loosely mounted on the shaft of the roller and provided with the pivoted pawl f^2 at the upper end of the same, by means of which the ratchet f^3 and the bronze-roller below the bronzing-fountain are rotated.

Adjacent to the bronze-supplying roller f' are arranged two series of bronzing-pads p, the shafts of which are supported in longitudinal supporting bars or carriages p', that are suitably supported, as shown in Figs. 5 and 6. The pads p are divided into two series, of which one is arranged alternating or staggering with the other series. To each shaft p^2 of the pads is keyed at its upper end a worm-gear p^3, which meshes with a longitudinal worm p^4, the shaft m^5 of which is supported in adjustable bearings p^5 in the side standards. The shaft m^5 is extended at one end beyond the casing of the machine and rotated by a belt b^2 and pulley transmission from the driving-shaft Z, so as to impart rotary motion to both series of pads, one set being rotated in opposite direction to the other. The faces of the pads are made of felt, fur, or other suitable material, the shape of the pad being so arranged that the widest portion is at the end, from which the pad is tapering toward the opposite end. By the rotation of the pads in opposite direction to each other the uniform distribution and polishing of the bronze upon the surface of the paper or other material to be bronzed is insured.

For removing the superfluous bronze-powder from the sheet after it has passed below the bronzing-pads p two dusting-rollers h h' are used, which extend parallel with and along the full width of the sheet-carrying cylinder B and are rotated in contact therewith. The shafts m^6 m^7 of the dusting-rolls h h' are supported in bearings of the side standards and also rotated by belts b b' and pulley transmission from the driving-shaft Z, as shown in Fig. 1. The dusting-rolls h h' are made of a series of disks of muslin or cardboard, which are held tightly on their shafts by end disks. They are rotated in the opposite direction to the sheet-carrying cylinder B and driven at considerable speed, so as to remove the surplus bronze from the bronzed sheet and drop the same onto an inclined transmitting-chute h^2, that is arranged between the side walls of the casing below the dusting-rolls h h', as shown in Fig. 3. In connection with the rotary dusting-rolls h h' are arranged stationary scrapers h^3 h^4, which are placed at an inclination to the vertical plane of the bronzing-rolls h h', so as to remove any adhering bronze from the surface of the dusting-rolls h h' and drop the same on the delivery-chute h^2, from which the bronze is delivered onto a collecting-box h^5, that is supported on the side standards A of the frame, as shown in Fig. 3. The dusting-rolls h h' are preferably surrounded by a layer of yielding material, so as to rotate in contact with the sheet-carrying cylinder and produce a slight frictional action on the bronze-covered sheet for effectively removing the surplus bronze from the same.

A delivery-roll i is rotated in contact with the sheet-carrying cylinder B near the inner end of the delivery-board D, which is supported below the feed-table by means of suitable adjustable bracket-straps D′ and hinges D^2, as shown in Figs. 1 and 3. The delivery-board is provided with an adjustable stay D^3 for receiving the bronzed sheets of paper. In proximity to the delivery-roll i is a second delivery-roll i', to which rotary motion is imparted by means of a belt-and-pulley transmission i^2 i^3 i^4 from the driving-shaft Z, as shown in Fig. 1. The object of the delivery-roll i is to feed the bronzed sheet forward on the second delivery-roll i' after the strippers have released their hold on the forward edge of the sheet from contact with the sheet-carrying cylinder. For this purpose a number of stripping-fingers i^5 are arranged on a rock-shaft i^6, which is located near the delivery end

of the machine and which is provided with a crank-arm i^7, that is connected by a helical spring i^8 with one of the side standards of the machine, as shown in Figs. 2, 3, and 4. The stripping-fingers i^5 are curved toward the sheet-carrying cylinder B, so as to move in contact with the surface of the same under the tension of the spring i^8. At both ends of the rock-shaft i^6 of the stripping-fingers i^5 are arranged inwardly-extending arms i^9, provided with antifriction-rollers i^{10}, that move in contact with the circumference of the ends of the sheet-carrying cylinder. The antifriction-rollers i^{10}, as well as the ends of the stripping-fingers, move uniformly over the surface of the sheet-carrying cylinder until they arrive at a part in proximity to the gripper-plate E^8 of the cylinder, where depressions are arranged in the ends of the cylinder, so as to cause the antifriction-rollers i^{10} to drop in said depressions and permit thereby the ends of the fingers to enter into a recess of the cylinder that has before been closed by the gripper-plate. Simultaneously with the entrance of the antifriction-rollers i^{10} into the depressions the gripper-plate E^8 is released from the ends of the sheet, so as to permit the same to be engaged by the stripping-fingers i^5, whereby the end of the sheet after being released by the gripper-plate E^8 and deflected by the ends of the stripping-fingers i^5 over the delivery-roller i is fed forward between it and the convex surface of the curved fingers to the delivery-roller i' onto the delivery-board, as shown in dotted lines in Fig. 3, and removed from contact with the sheet-carrying cylinder. The gradual wear of the ends of the stripping-fingers by contact with the sheet-carrying cylinder B is compensated by the antifriction-rollers, while the spring acting on the rock-shaft always holds the fingers in reliable contact with the cylinder B. To insure a still more efficient removal of the bronze from the cylinder B, a scraper M is provided, which contacts with the cylinder and removes thereby all bronze adhering to the surface thereof and causes the same to fall into a receptacle M'.

The operation of my improved machine is the same as the other well-known bronzing-machines heretofore in use, and is briefly as follows: A sheet of paper to be bronzed is fed from the feed-table C past the guide-fingers G onto the gripper E^8 on the cylinder B, and after the gripper has engaged the front edge of the sheet the sheet is drawn first past the bronze-supplying roll f', from which it is passed beneath the bronzing-pads p, so that the bronze supplied to the sheet is evenly distributed over the same. The sheet is next acted upon by the dusting-rolls h h', which remove any superfluous bronze and deliver the same to suitable collecting mechanism h^5. The sheet is then conducted over the delivery-roll i to the stripping-fingers i^5 and by the same delivered onto the second delivery-roll i' and to the delivery-board D. The bronze which is collected is removed from time to time from the machine and then sifted for being used over again.

I claim as new and desire to secure by Letters Patent—

1. In a bronzing-machine, the combination, with a sheet-carrying cylinder, provided with a sheet-gripping mechanism for engaging and releasing the front edge of the sheet, of a delivery-roll rotated in contact with the sheet-carrying cylinder, a second roll in proximity thereto, a delivery-table, oscillating and spring-actuated stripping-fingers, and means for moving the stripping-fingers in the path of the sheet as soon as the same passes the delivery-roll and is released by the gripping mechanism of the cylinder for delivering the sheet onto the second delivery-roll and delivery-table, substantially as set forth.

2. In a bronzing-machine, the combination, with a sheet-carrying cylinder and sheet-gripping mechanism thereon for engaging and releasing the front edge of the sheet, of a delivery-roll rotated in contact with the sheet-carrying cylinder, a second delivery-roll, a delivery-table, a rock-shaft, oscillating and spring-actuated stripping-fingers on said rock-shaft, arms carrying antifriction-rollers on said rock-shaft adapted to engage depressions in the end of the shaft of the sheet-carrying cylinder for delivering the sheet onto the second delivery-roll and delivery-table, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

MAX FRITSCHE.

Witnesses:
PAUL GOEPEL,
JOSEPH A. KAPP.