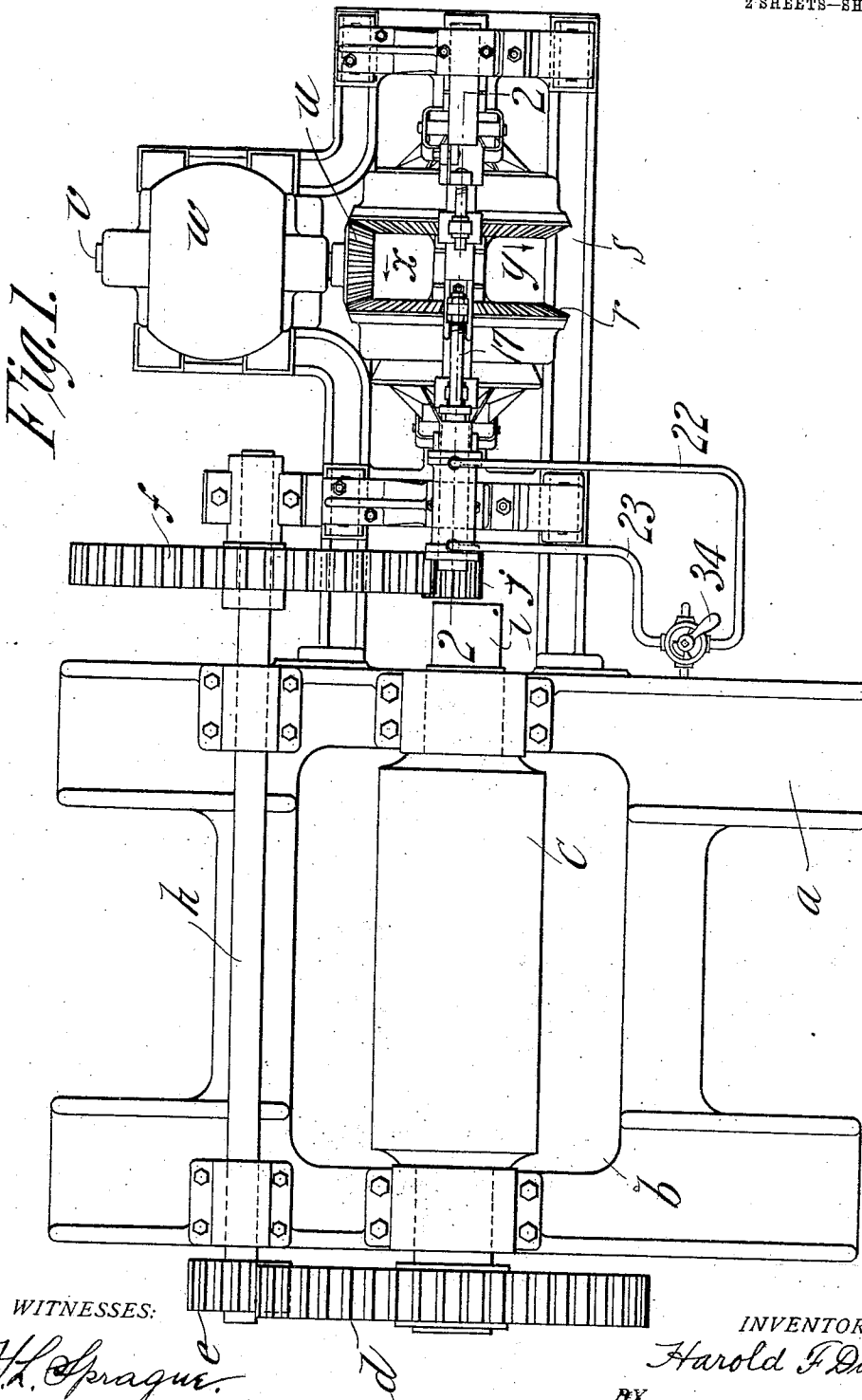


H. F. DUNBAR.
PLATING MACHINE.
APPLICATION FILED FEB. 2, 1909.

939,990.

Patented Nov. 16, 1909.
2 SHEETS—SHEET 1.



WITNESSES:

H. L. Sprague.

Harry W. Bowen.

INVENTOR.

Harold F. Dunbar

BY

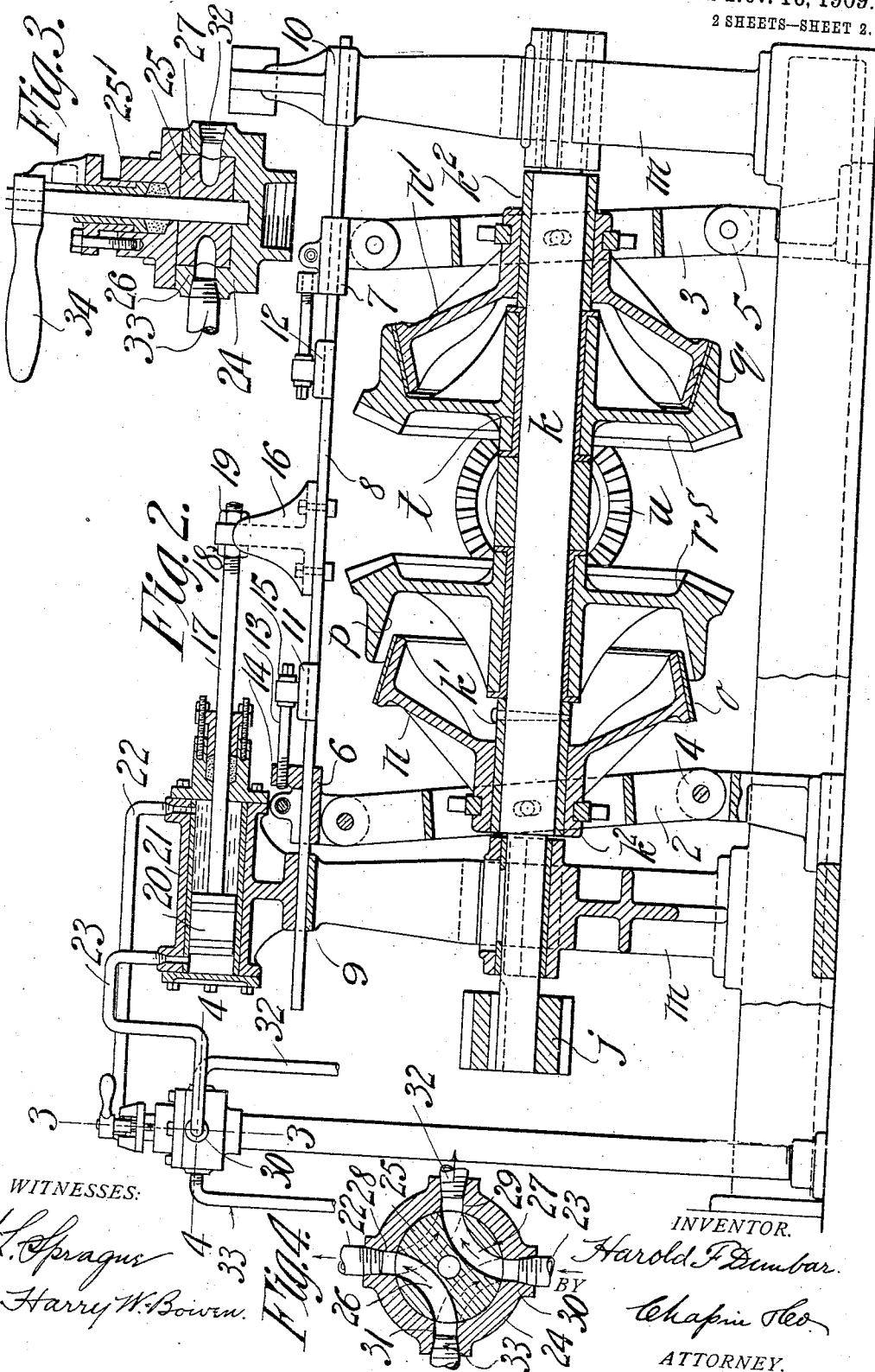
Chapin Geo.

ATTORNEY.

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UNITED STATES PATENT OFFICE.

HAROLD F. DUNBAR, OF TURNERS FALLS, MASSACHUSETTS.

PLATING-MACHINE.

939,990.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed February 2, 1909. Serial No. 475,557.

To all whom it may concern:

Be it known that I, HAROLD F. DUNBAR, a citizen of the United States of America, residing at Turners Falls, in the county of Franklin and State of Massachusetts, have invented new and useful Improvements in Plating-Machines, of which the following is a specification.

This invention relates to improvements in driving mechanism for plating machines as used for calendering or finishing paper.

As is well known in plating machines, sheets of paper are interposed between plates or sheets of zinc so that a pile or stack of alternately arranged sheets of paper and zinc is built up to any desired thickness, the whole mass being then subjected to pressure by passing the same between a pair of rotating pressure rollers in the usual manner which are adapted to be rotated in opposite directions.

Formerly, it has been the practice to operate the rollers by means of gears or cross-belts requiring the attendance of an operative to manually shift the gears or belts in order to change the directions of rotation of the rollers. This operation has been unsatisfactory on account of the belts throwing off small particles of grease or dirt into the machine and at the same time requiring considerable strength of the operator to effect the shifting of the belt.

My improvement relates particularly to improvements in hydraulic clutch-operating mechanism whereby the direction of rotation of the rollers can be readily changed by simply operating the handle of a four-way valve permitting water or other fluid, under pressure, to flow into a cylinder and on opposite sides of a piston located therein, whereby the piston will be moved in either direction according to the movements of the handle and clutch-operating means between the piston and the driving motor. It also includes a continuously driven motor in one direction, preferably an electric motor, on the shaft of which is mounted a beveled gear or pinion that is adapted to mesh with either one of two beveled gears that are secured to a shaft on the end of which is located a pinion for driving the mechanism that operates the pressure rollers of the machine.

In the drawings forming part of this application,—Figure 1 is a plan view showing the general arrangement and location of the

various parts of my improvement. Fig. 2 is a detailed sectional view on the line 2—2 of Fig. 1, clearly illustrating the arrangement of the frictional clutches that are adapted to engage beveled gear-wheels, these gear-wheels being constantly operated from a constantly operating electric motor, so that when either clutch is operated the shaft will be operated in one direction or the other. Fig. 3 is a detailed vertical sectional view of the valve on the line 3—3 of Fig. 2, and Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 2.

Referring to the drawings in detail, *a* designates, in general, the framework of the machine on which is placed a stack or block *b* of paper built up with alternate layers of zinc plates. *c* designates one of the pressure rollers located above the stack and adapted to engage the upper surface of the same. This roller is driven through the spur-gearing *d*, *e*, *f*, and *g*,—the gears *e* and *f* being connected together by means of the shaft *h*, and the gear *d* being secured to the shaft *i* of the roller *c*.

Meshing with the gearing *f* is a pinion or gear *j* that is located on the end of a countershaft *k* which is supported in suitable bearings *m* on the bed of the machine. The countershaft *k* has secured thereto by a spline and groove or other connection *k*¹ on the sleeve *k*², two frictional cone-members *n* and *n*¹ that are provided with a facing *o* of leather, or other suitable material. This facing element of the cone-members *n* and *n*¹ is adapted to engage the conical or beveled surfaces *p* and *q* on the rear part of the beveled gears *r* and *s* which are mounted in bearings *t* on a shaft *h*. These beveled gears mesh with the beveled gear or pinion *u* that is secured to the armature shaft *v* of the electric motor *w* which is constantly driven; and as the pinion *u* meshes with the bevel gears *r* and *s*, these gears are constantly rotated and in opposite directions, as shown by the arrows *x*, *y*, and *z* in Fig. 1.

In order to shift the frictional cone members *n* and *n*¹ in opposite directions and into engagement with the beveled surfaces *p* and *q* of one of the gears *r* and *s*, links or levers 2 and 3 are pivotally secured at 4 and 5 to the base of the machine and to the blocks 6 and 7 at their upper ends. These blocks are mounted on the bar 8 which is adapted for reciprocation in the bearings *m*, as shown at 9 and 10. The blocks 6 and 7 are secured

to the bar 8 by means of the members 11 and 12, and the rods 13, which are secured to the blocks 6 and 7 by the threaded end 14 and the nuts 15. This construction permits
 5 accurate adjustment of the levers 2 and 3 which operate the frictional cone-members n, n' .

Attached to the bar 8 is a post 16 to which is secured a piston rod 17 by means of the
 10 nuts 18 and 19. The piston 20 and cylinder 21 are mounted on the upper end of the bearings m as shown, and leading into the opposite ends of the cylinder 21 are pipes 22 and 23 which lead to a four-way valve-chamber 24. Mounted within this chamber
 15 is a rotatable plug 25 having curved passages 26, 27, formed therein. The valve-chamber 24 is provided with four openings, designated at 28, 29, 30, and 31. The pipe
 20 22 connects with the opening 28, and the pipe 23 connects with the opening 30, while leading from the openings 29 and 31 are pipes 32 and 33.

In the position of the parts shown, water
 25 under pressure is being admitted through the pipe 33 into the casing 24 through the opening 26 in the plug 25, and pipe 22, to the right-hand end of the cylinder 21, as shown in Fig. 2. This water pressure will
 30 move the piston 20 toward the left and through the piston-rod 17, post 16, and the bar 8, the lever 3, to which is attached the frictional cone n^1 into engagement with the surface q of the beveled gear s , whereby the
 35 shaft k will be operated in the direction shown by the arrow y , and the roller c driven in one direction and its companion roller (not shown) in the opposite direction. At the same time the frictional cone n on the
 40 opposite end of the shaft k will be thrown out of contact with the beveled surface p of the gear r , permitting this gear to run idle.

After the rollers have traversed the length
 45 of the stack b the operator throws the valve-handle 34 toward the left through an arc of nearly 90° , which operates the plug 25 by means of the stem 25¹ so as to allow water

under pressure to enter the cylinder 21 by the pipe 23, and flow to the opposite side of the piston 20 at the same time the water on
 50 the opposite side of the piston will be allowed to escape through the pipe 22 and the waste-pipe 32, as readily understood. The position of the plug 25 after movement is
 55 shown by the dotted lines in Fig. 4. It will therefore be seen that I have provided sufficient and rapid means by which the operator can readily change, by simply operating the valve-handle 34, the direction of rotation of the rollers.

What I claim, is:—

1. A paper-plating machine having in combination with a continuously operating motor, a cylinder, means for rotating the cylinder in opposite directions, said means
 65 including a shaft and connecting means between said shaft and the cylinder, a pair of frictional cone-members connected to said shaft, means to move the cone members in opposite directions for engaging oppositely
 70 rotating members that are driven from the motor, said means including a reciprocable bar, a cylinder having a piston therein, the piston being secured to the bar, and valve construction for permitting a fluid under
 75 pressure to be admitted to the opposite sides of the piston, whereby when the valve is operated the cone-members will be moved alternately in opposite directions, and the cylinder operated in reverse rotation, as described.

2. A plating machine having in combination, a shaft, a pair of frictional cone members thereon, means for rotating the same in opposite directions, a cylinder, a piston
 85 therein, connecting means between said cone members and said cylinder, a four-way valve for admitting and releasing a fluid under pressure, whereby the movements of the piston are controlled, substantially as described.

HAROLD F. DUNBAR.

Witnesses:

K. I. CLEMONS,

H. W. BOWEN.