

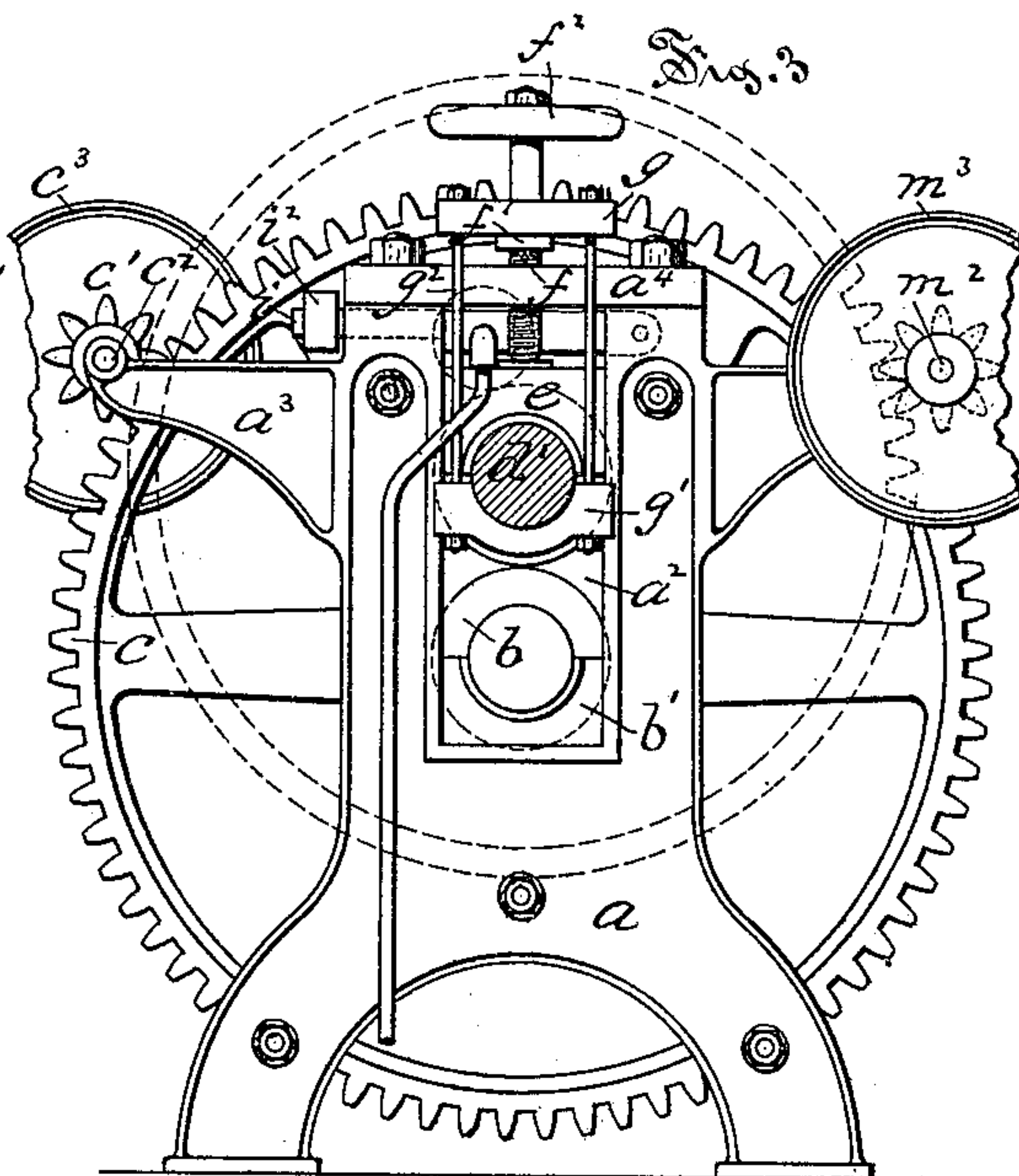
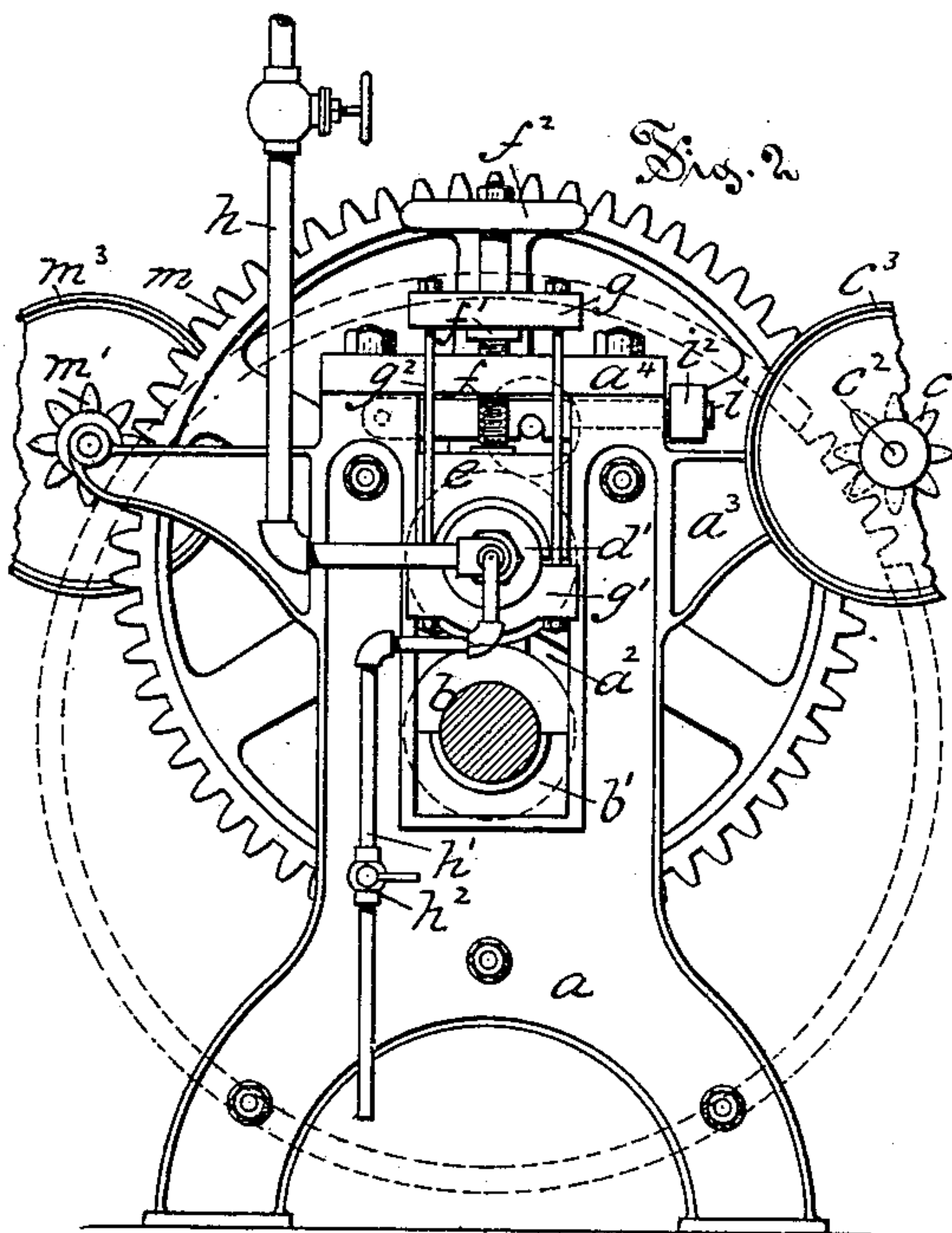
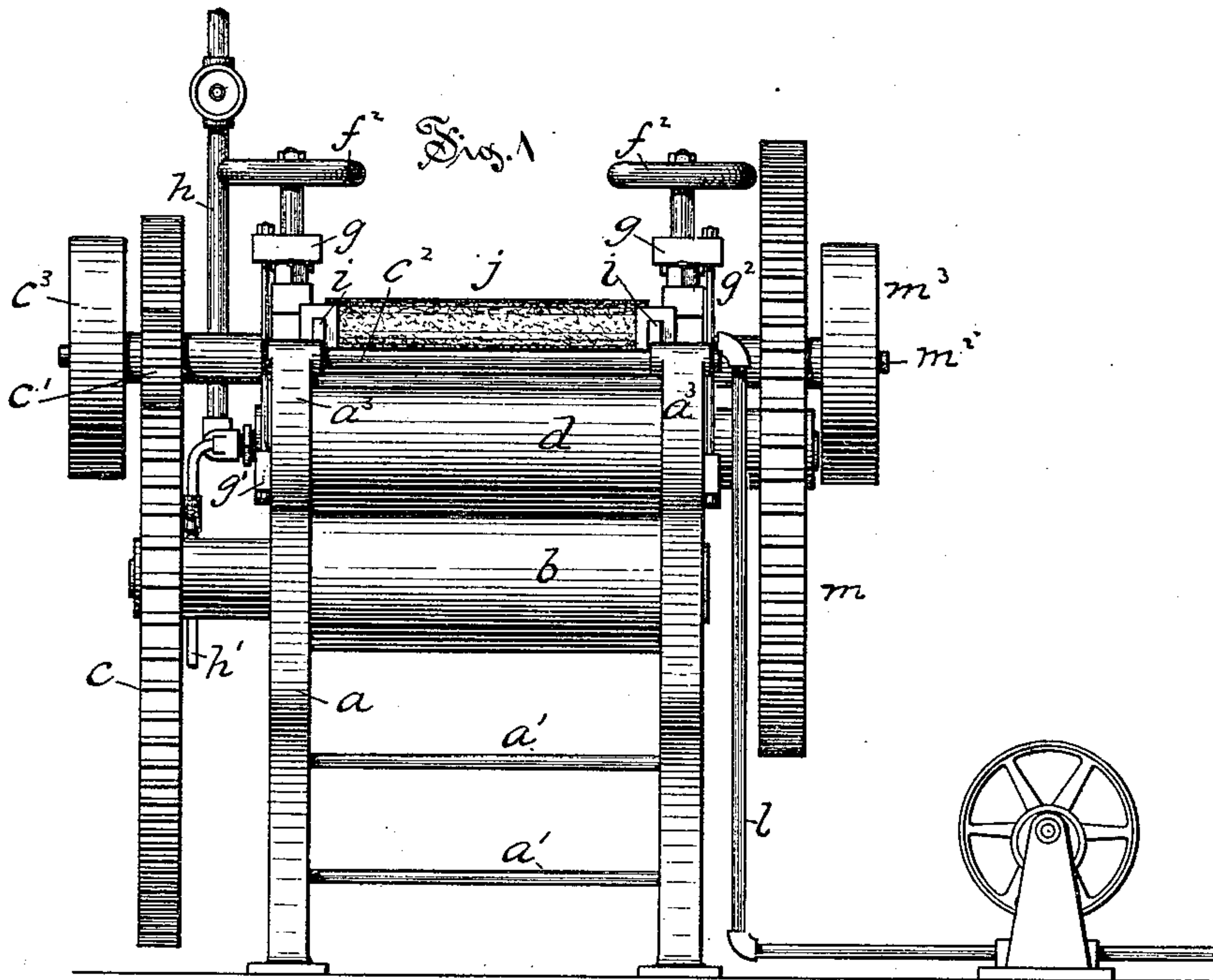
(No Model.)

2 Sheets—Sheet 1.

H. F. & F. L. CASE.
PAPER FINISHING MACHINE.

No. 335,562.

Patented Feb. 9, 1886.



Witnesses

W. M. Sporkman.

A. R. Williams.

Inventors

Henry F. Case and

Frederick L. Case

by Simonds & Burdett,
Attys

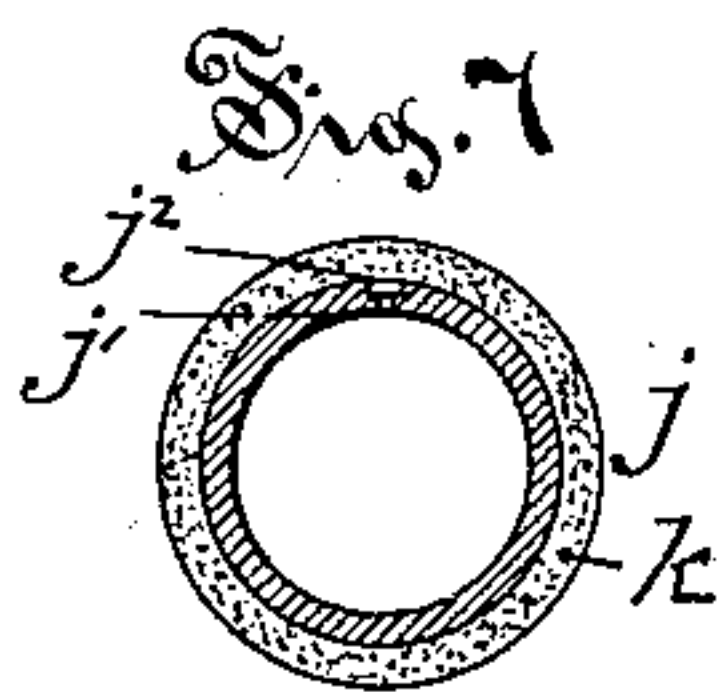
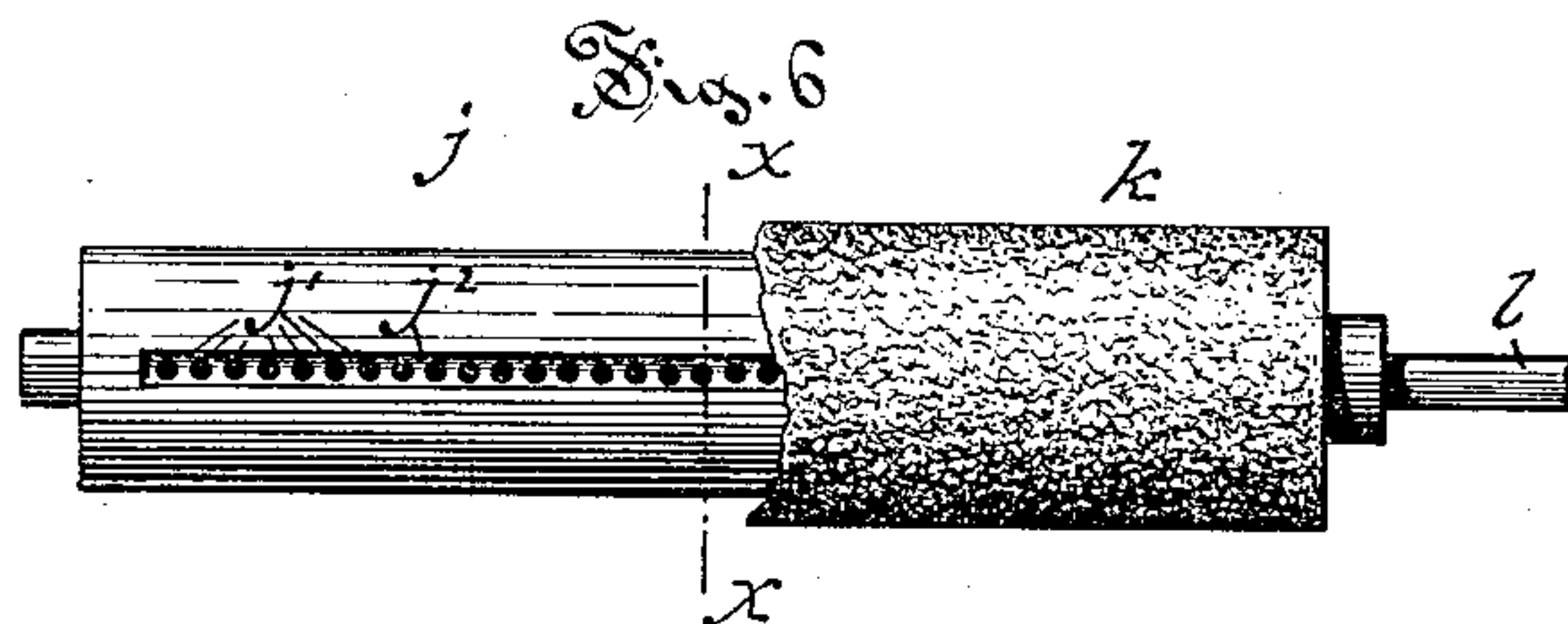
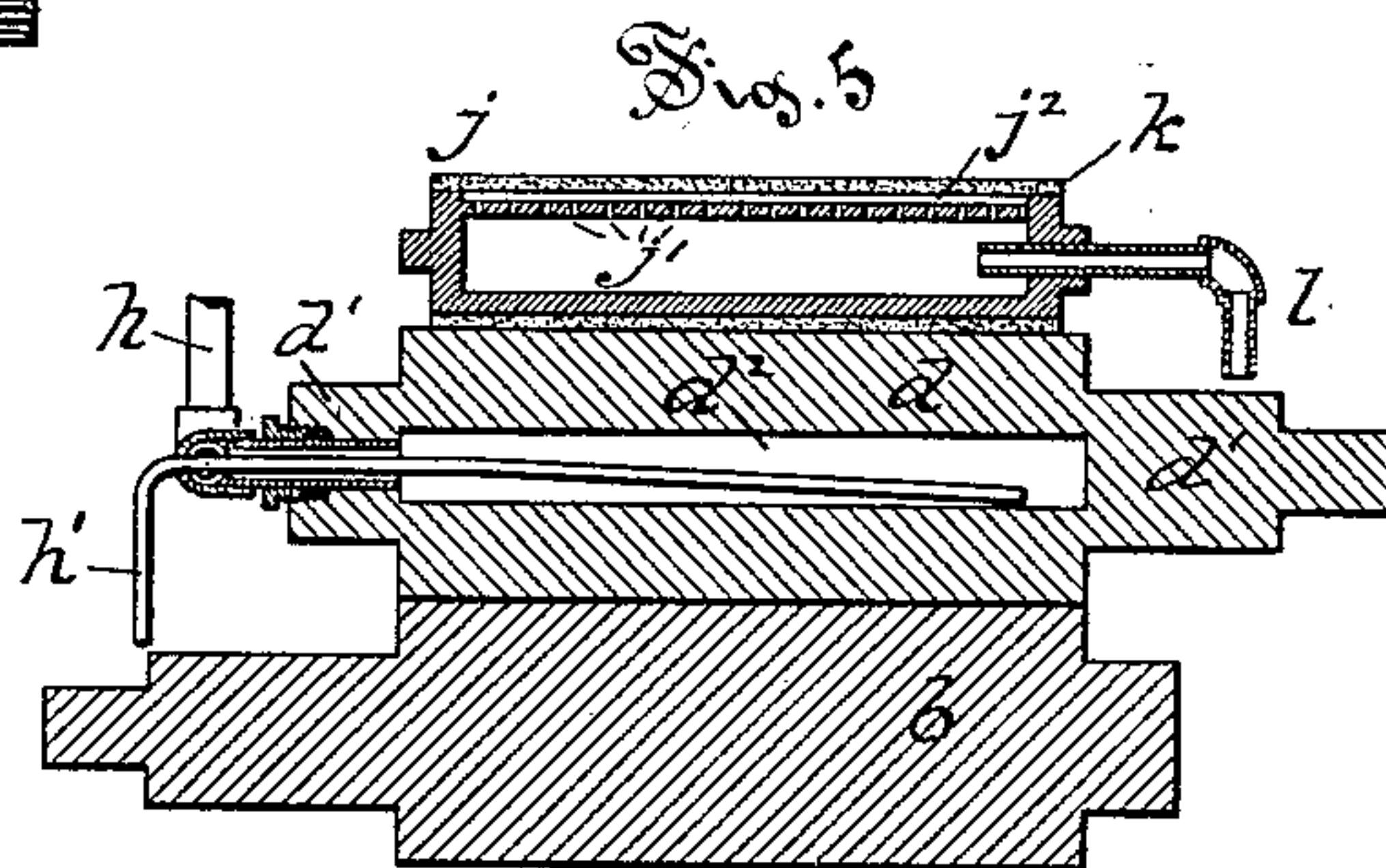
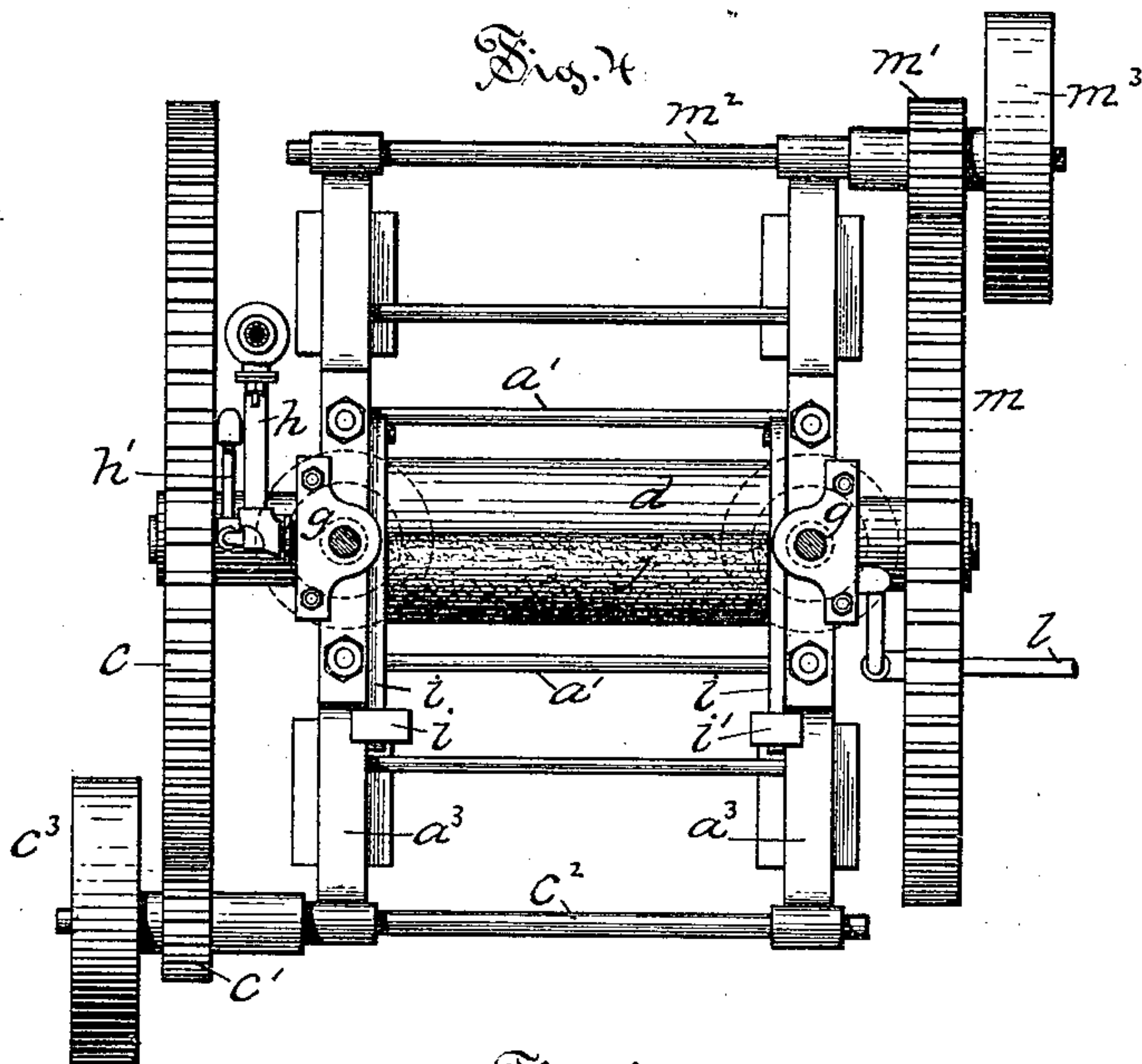
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UNITED STATES PATENT OFFICE.

HENRY F. CASE AND FREDERICK L. CASE, OF SOUTH MANCHESTER, CONN.

PAPER-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 335,562, dated February 9, 1886.

Application filed October 28, 1885. Serial No. 181,120. (No model.)

To all whom it may concern:

Be it known that we, HENRY F. CASE and FREDERICK L. CASE, of South Manchester, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Finishing Machines, of which the following is a description, reference being had to the accompanying drawings, where—

Figure 1 is a front view of our improved machine. Fig. 2 is a side view of the same looking from the left of Fig. 1. Fig. 3 is a side view of the same looking from the right of Fig. 1. Fig. 4 is a top view of the machine. Fig. 5 is a detail view in vertical longitudinal section through the several rollers. Fig. 6 is a detail view on enlarged scale of the felt-covered roller, with parts broken away to show construction. Fig. 7 is a detail view in cross-section of this roller on plane denoted by line *x x* of Fig. 6.

The object of our invention is to provide a machine that is capable of finishing paper by means of rollers, the paper being rendered firm and compact and its tensile strength increased by the operation of the machine at the same time that one of its surfaces is highly polished.

Our invention consists in the combination of two rollers, one of which is heated and has its surface coated or covered with a composition, of which oil or the like fatty matter forms an important ingredient, and in the combination of these rollers with the device for supplying and distributing the lubricator, and in details of the construction and combination of the parts, as more particularly hereinafter described.

In the accompanying drawings, the letter *a* denotes the frame of the machine, which as a whole resembles a stack of calender-rolls, the upright sides of the frame having feet or standards, upon which it is supported, and being bolted together by suitable cross-ties and rods, *a'*.

The roller *b* extends between the inner faces of the frame, with journals that turn in suitable bearings in boxes *b'*, that are held in the vertical mortise *a''* in the sides of the frame. One of the journals of this roller extends beyond the side of the frame, and bears a cog-wheel, *c*, which, in order to obtain the neces-

sary power, is of a diameter several times as large as the roller, and this wheel *c* is in mesh with a smaller cog-wheel, *c'*, fast to the shaft *c''*, that is supported in suitable bearings on the brackets *a''*, and also bears the pulley *c''*. This pulley is driven by a belt from a counter-shaft, which, by means of the intermeshing cog-wheels, serves to rotate the roller *b* in the direction indicated by the overlying arrow in Fig. 2.

The roller *d* is arranged across the frame directly over and parallel to the lower roller, *b*, and it has journals, *d'*, that turn in bearings in the vertically-movable blocks *e*. The roller-bearing in each of these blocks is on its under side and of a depth that permits it to extend but part way around the journal of the roller, and it has a flange, *e'*, that lies between the end of the roller and the inner side of the frame, and prevents endwise play of the roller, and also the block from being pushed out of the mortise *a''*.

The vertical spindle *f* is threaded for a part of its length, and is movable in a threaded socket in the cross-bar *a'* on the side of the frame, and is so placed that its lower end bears directly upon the upper side of the block *e*. A collar, *f'*, is secured to this spindle *f* at a point above the top of the frame, and above this collar there is arranged about the stem a cross-piece, *g*, from which rods extend downward and are secured as by the nut to the cap *g'*. The object of this construction is to enable the roller *d* to be lifted by the rotation of the spindle *f*, as by means of the handle *f''*, the cap, cross-piece, and tie-bolts, making up what may be termed a "yoke," *g''*. By means of this same screw-spindle *f* the roller *d* may be forced downward, so as to increase the pressure between the two rollers in the ordinary manner. One of these rollers—preferably the upper one, *d*—has a central opening, *d''*, closed at one end, and into this the end of a steam-pipe, *h*, opens after passing through packing-boxes of the ordinary construction, and a smaller outlet-pipe, *h'*, leads from this chamber *d''* through the sides of the pipe *h* and down to an outlet-valve, *h''*. By means of this device steam may be circulated through the chamber and used to heat the roller *d*.

To the inner sides of the upright frame, and

at points opposite each other, are pivoted the levers i , that extend horizontally toward the front of the frame across the roller d and bear sockets i' on their lower edge, that more or less inclose the journals of a roller, j , and the outer ends of these levers support movable weights i^2 , by means of which the degree of downward pressure upon the roller j may be adjusted. This roller j is hollow with comparatively-thin walls, and has along one side a row of holes, j' , and the outer ends of these holes are joined by the groove j^2 , that extends along the outer surface of the roller. Upon the outside of this roller there is fastened a jacket or cover, k , of porous material, as felt, and a pipe, l , is led into the center of this roller through openings in the end wall and the journal, which opening is suitably packed to prevent leakage. The other end of this pipe is connected to a pump or like device for filling this roller with a lubricating material under pressure.

One of the journals of the upper roller, d , extends through the frame and bears a cog-wheel, m , that is in mesh with a smaller cog, m' , fast to the shaft m^2 , that is supported in bearings in brackets on the frame and bears the pulley m^3 , by means of which the roller is driven by means of a belt from a counter-shaft.

The upper and heated roller in the machine is rotated faster than the lower roller, and a sheet of paper or paper-board introduced between the rollers, which turn toward each other, is drawn between them, heated and compacted, and has the surface toward the heated roller highly polished in its progress between the rollers. This, however, is only true when the surface of the upper roller is covered or coated with a film of material, of which oil or the like fatty substance forms an important ingredient. Without this lubricating material it is practically impossible to operate the machine to produce the desired effect upon the paper; but with its use highly beneficial results are obtained.

By means of this machine we can provide with a highly-polished surface paper or paper-board adapted for use as press-boards and like purposes, which cannot be finished and polished by machines of the prior art now in use for such purposes.

We do not limit ourselves to the precise construction and arrangement of the rollers, the important feature being the use of a cold and a heated roller driven at different rates of speed, and the use of a lubricating material applied to the heated roller so as to form a film or coating over its surface, and the particular means of supplying this lubricating material is not important so long as it is distributed

in a comparatively uniform coat over the heated roller.

Our improved machine may be used to finish single sheets of paper or like material, or an endless sheet or web of the same, but in the latter case care should be taken to prevent the contact of the cold and heated rollers when the paper is not passing between them, as in case of any break in the web or continuous sheet the lubricating material would be transferred to the lower roller and cause delay in cleaning.

We claim as our invention—

1. In a machine for finishing paper or like material in combination, a pair of rollers with driving mechanism, one roller being driven at a higher speed than the other and having its surface coated with a film or cover of lubricating material, all substantially as described.

2. In combination, a lower roller and its driving mechanism, the upper heated roller and its driving mechanism, and a reservoir from which a lubricating material is distributed upon the heated roller, all substantially as described, and for the purpose set forth.

3. In combination with a lower roller, b , and its driving mechanism, the roller d , with central chamber, d^2 , the steam-supply pipe h and outlet-pipe h' , the screw-spindle f , borne in the frame, the yoke g^2 , connecting the spindle with the cap g' below the journal of the roller d , and the bearing-blocks e , located between the bottom of the screw-spindle and the top of the journals of the roller d , all substantially as described.

4. In combination with the roller b and its driving mechanism, the hollow roller d , with its driving mechanism, and the steam-supply pipe h and outlet-pipe h' , the screw-spindle f , the yoke g^2 , the bearing-blocks e , and the hollow roller j , with supply-pipe and holes through which lubricating material is supplied to the porous cover k of the roller, the latter roller being supported in contact with the roller d , all substantially as described.

5. In combination with the lower roller, b , and its driving mechanism, the upper roller, d , with its driving mechanism, a central chamber, d^2 , the steam-supply pipe h and outlet-pipe h' , the roller j , with holes j' in its shell united by the groove j^2 , and having the porous cover k , the levers i , pivoted to the frame with roller-sockets i' , and adjustable weights, all substantially as described.

HENRY F. CASE.

FREDERICK L. CASE.

Witnesses.

CHAS. L. BURDETT,
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