

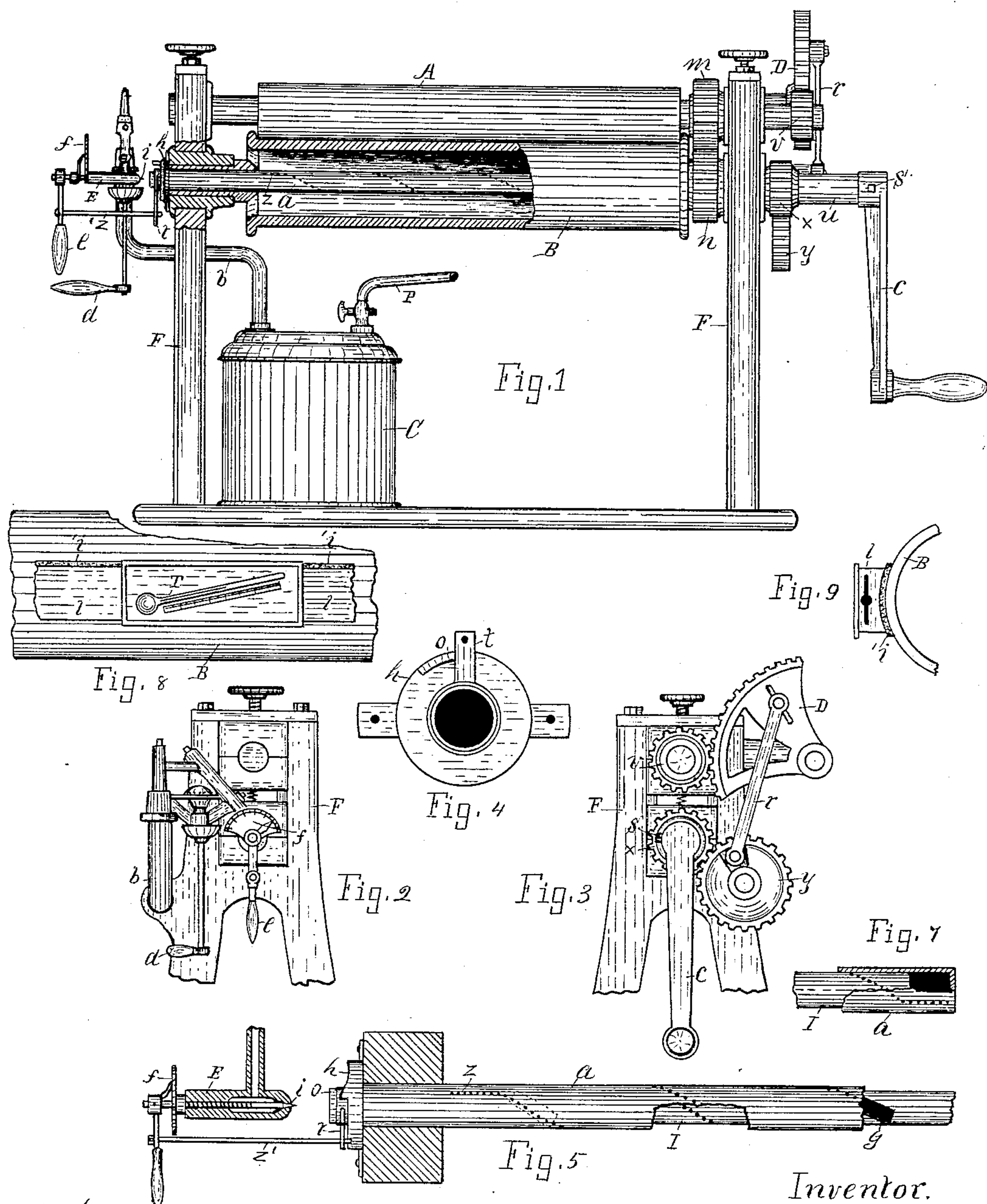
(No Model.)

A. H. HUMPHREY.

PHOTOGRAPHIC BURNISHING MACHINE.

No. 388,681.

Patented Aug. 28, 1888.



Witnesses,
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Atty-

UNITED STATES PATENT OFFICE.

ALFRED H. HUMPHREY, OF MENDON, MICHIGAN.

PHOTOGRAPHIC BURNISHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 388,681, dated August 28, 1888.

Application filed January 30, 1888. Serial No. 262,357. (No model.)

To all whom it may concern:

Be it known that I, ALFRED H. HUMPHREY, a citizen of the United States, residing at Mendon, county of St. Joseph, State of Michigan, have invented a new and useful Photographic Burnishing-Machine, of which the following is a specification.

This invention more particularly relates to burnishing-machines in which are employed 10 revoluble cylinders between which the photograph is passed.

The invention has for its leading object the construction of the below described and claimed apparatus for heating said cylinders. 15 In the drawings forming a part of this specification, Figure 1 is a side elevation, parts being broken away. Fig. 2 is an end elevation looking from a point at the left of Fig. 1; Fig. 3, an end elevation looking from a point at the right of Fig. 1; Fig. 4, a lettered detail in Fig. 1, enlarged, looking from a point at the right hand; Fig. 5, enlarged lettered details from Fig. 1, broken and partly in section; Fig. 6, a broken detail from Fig. 5. Fig. 7 shows 20 broken parts hidden in Fig. 1, and Figs. 8 and 9 are an elevation and end view of parts below described.

Referring to the letters marked on the drawings, F are end standards, which support in a 30 revoluble manner the hollow cylinders A B. The feed-cylinder A is smaller than the burnishing-cylinder B, and for this reason a finer burnish is given the photograph, because the periphery of cylinder B passes over the face 35 of the photograph faster than the card passes between the cylinders. The gear *x* on the collar *u* of crank *c* drives the gear *y*. A connecting-rod, *r*, connects the gear *y* with the segment of a gear of greater diameter than 40 said gear *y*. The segment drives the pinion *v* of the cylinder A, and gear *m*, meshing with gear *n*, revolves the cylinder B. When thus operated, the collar *u* is loose on the axis of the cylinder B. By means of the parts *y* D *r*, 45 as here arranged, the cylinders revolve first in one direction and then in the other, while the crank *c* turns in one direction, because the segment oscillates. Thus the card is fed through and back without changing the motion of the 50 crank. This gear arrangement may be modi-

fied or other devices substituted to accomplish the same result.

When desiring to use the machine in the ordinary way, the gear *v* is removed, it being detachable from its shaft, and the crank *c* is 55 locked with the axle of cylinder B by tightening the set-screw *s*.

In Figs. 5 and 7 is shown the device or apparatus for heating the cylinders. The tubes 60 *a* I are broken, as here shown, and Fig. 7 illustrates the right-hand end, which the cylinder B hides in Fig. 1. These tubes are concentric with each other and are located in the cylinder B, as in Fig. 1. The outer tube, *a*, is fixed stationary in left-hand post F, and the 65 inner tube, I, is adapted to be revolved in the outer one, or, more properly, rotated part way over and back. If preferred, the inner tube may be the fixed one. The tube I is rotated by lever *t*, attached to it at the end. Each 70 tube has a line of perforations, preferably spirally around it, but may be straight and extending from end to end, which perforations register with each other—that is, those of the inner tube with those of the outer tube. The 75 inner tube has slots *g* in the path of the spiral of perforations, Figs. 5 and 6. In lieu of the line of perforations, a continuous slit may be cut in the tubes; but the perforations are preferable, for the reason that with the slit the 80 tubes are not as strong and might be liable to twist; but the line of perforations must be virtually the same as a continuous slit—that is, close enough together so that when the gas or vapor is ignited at *z*, Figs. 1 and 5, the 85 flame will be transmitted along the entire line of the gas or vapor escaping from the inner tube, I, through the registering perforations of both tubes.

On the cap *h*, Figs. 4 and 5, is a stop, *o*, to 90 limit the throw of the lever *t*, as the perforations of the inner tube register with those of the outer tube when said lever is brought into contact with said stop.

I have here shown a gasoline-vapor generator 95 for supplying the inner tube with vapor; but gas or other suitable fluids or vapors may be employed; hence I do not limit myself to the use of gasoline and the particular generator shown.

At C is shown a gasoline-can. 100

P is a pipe for blowing air into the can to force the gasoline through pipe *b* into the burner. This ordinary generator and burner will be readily understood without description here further than the following:

To the lever *e* is attached an arm, *z'*, which arm is brought into contact with the lever *t* of tube I. The pointed spindle *i* is drawn farther out or carried farther in the hole in the end of the tube E, Fig. 5, (said spindle being screw-threaded in said tube E,) by oscillating the lever *e* one way or the other, as desired, to control the amount of vapor or gas which flows out of the end of the tube E around the tapered end of the spindle *i*. This action contacts the arm *z'* with lever *t* and rotates tube I at the same time and by the same action which regulates or entirely shuts off the supply of vapor. If entirely shut off, then the perforations of the inner tube and the slots *g* will not register with the perforations of the outer tube, and the flame is put out and at the same time the supply of vapor is shut off; but the important feature is that the supply of vapor is regulated in accordance with the desired extent of the flame. To illustrate: With the flame the entire length of the line of perforations, the cylinders very quickly become sufficiently hot. Then by turning the inner tube so that none of its perforations will register with the perforations of the outer tube, but so that the slots *g* will thus register, Fig. 5, all the flame goes out except where the slots *g* are, and thus the desired temperature of the cylinders is preserved without overheating, and, as before stated, the flow of vapor into the tube is proportionately decreased. The inner tube may be turned by taking hold of the lever *t*, if preferred, and thus dispense with the arm *z'*; but the flow of gas may be regulated outside of the tube, and only employ one tube, and do very satisfactory work. As I do not wish to confine myself to the tubes, the tube *a* in Fig. 1, in the burnishing-cylinder B, will serve to illustrate a single tube, into the end of which the gas flows or into the inner one of two concentric tubes.

At *f* is an indicator, to the scale on the face of which a finger on the spindle *i* points to indicate the desired throw of the lever *e*. The ends of both tubes are open except the inner end of the outer tube, Fig. 7, and of course both ends of the burnishing-cylinder B are open, and the ends of the hollow feed-cylinder A are open as well to allow a circulation of air through it and prevent it from sweating. In some instances the slots *g* may be dispensed with, and, if preferred, both tubes may rotate when two are employed.

In Fig. 8, *l* is a plate broken at the ends, but in use is attached at each end to the standards F. This plate has a slot in the center covered with a glass, beneath or back of which is a thermometer, T. Back of the thermometer is a felt packing, *i'*, near to or in contact with the cylinder B. (See end view in Fig. 9.) Of course the use of this thermometer will read-

ily be understood to ascertain when the cylinders are at a proper temperature and enable the operator to keep them so by examining said thermometer.

Having thus described my invention, what I claim is—

1. The combination of the revoluble cylinders, gear-connected, one provided with a pinion, the other with a connected pinion and crank revoluble on its axle, a gear with which the crank-pinion meshes, a segmental gear meshing with one of the cylinder-pinions, and a connecting-rod between the segmental gear and the gear which meshes with the crank-pinion, whereby the cylinders rotate first one way and then the other while the crank is turned in one direction, substantially as set forth.
2. The combination of the gear-connected cylinders, one having a detachable pinion, the other having a connected crank and pinion rigidly attached to its axis by a set-screw, a gear meshing with the crank-pinion, a segmental gear meshing with the detachable pinion, and a connecting-rod between the segmental gear and the gear which meshes with the crank-pinion, substantially as set forth.
3. A gas or vapor burner for heating purposes comprising two concentric tubes, revoluble one in the other, and each provided with lines of perforations adapted to register with each other, in combination with the feed and burnishing cylinders, substantially as set forth.
4. A gas or vapor burner for heating purposes comprising the concentric tubes, one of which is adapted to rotate, and each provided with the lines of perforations, and one having the slots in its said line of perforations, in combination with the feed and burnishing cylinders, substantially as set forth.
5. A gas or vapor burner comprising the concentric tubes adapted to be rotated one within the other, or vice versa, each having the lines of perforations, and the inner one having the slots, and provided with a lever, a stop to limit the play or throw of said lever, and a supporting-frame, all combined with the cylinders between which the photograph passes, substantially as set forth.
6. In combination, the revoluble hollow cylinders between which the photograph is to be passed, means for rotating said cylinders, the concentric tubes in the burnishing-cylinder, each having the line of perforations, and one revoluble in the other, and provided with a lever to rotate it and a stop to limit the throw of said lever, substantially as set forth.
7. In combination, two revoluble hollow cylinders, means to rotate them, the concentric tubes having the spiral lines of perforations, the inner one provided with the slots in the line of its perforations, said tubes being in the burnishing-cylinder, and means to supply gas or vapor within the inner tube, substantially as set forth.
8. In combination, the revoluble hollow

cylinders, the concentric tubes in the burnish-
ing-cylinder having the spiral lines of perfora-
tions registering with each other, the inner
tube revoluble in the latter and provided
5 with a lever to rotate it by, a vapor-generator,
the handle of which operates the spindle to
control the flow of vapor, having an arm
adapted to contact with the lever of the inner
tube, and the supporting standards or frame,
10 substantially as set forth.

9. In combination, the hollow cylinders be-
tween which the photograph is passed, the
tubes therein having the lines of perforations,
one revoluble within the other, the revolu-
15 ble one having a lever, a vapor-generator hav-
ing an indicator denoting the throw of the
lever which controls the flow of vapor, and an

arm attached to said lever and adapted to con-
tact the lever of the revoluble tube, substan-
tially as set forth.

10. The combination of two hollow cylinders 20
between which the photograph is passed, a
tube in one of said cylinders having the line
of perforations, and a gas or vapor apparatus
for blowing the gas or vapor into said tube, 25
substantially as set forth.

In testimony of the foregoing I have here-
unto subscribed my name in presence of two
witnesses.

ALFRED H. HUMPHREY.

Witnesses:

GERSHORN P. DOAN,
GEORGE HUMPHREY.