(Model.)

G. T. CAMPBELL.

BELLOWS.

No. 334,934. Patented Jan. 26, 1886.

Fig. 1.

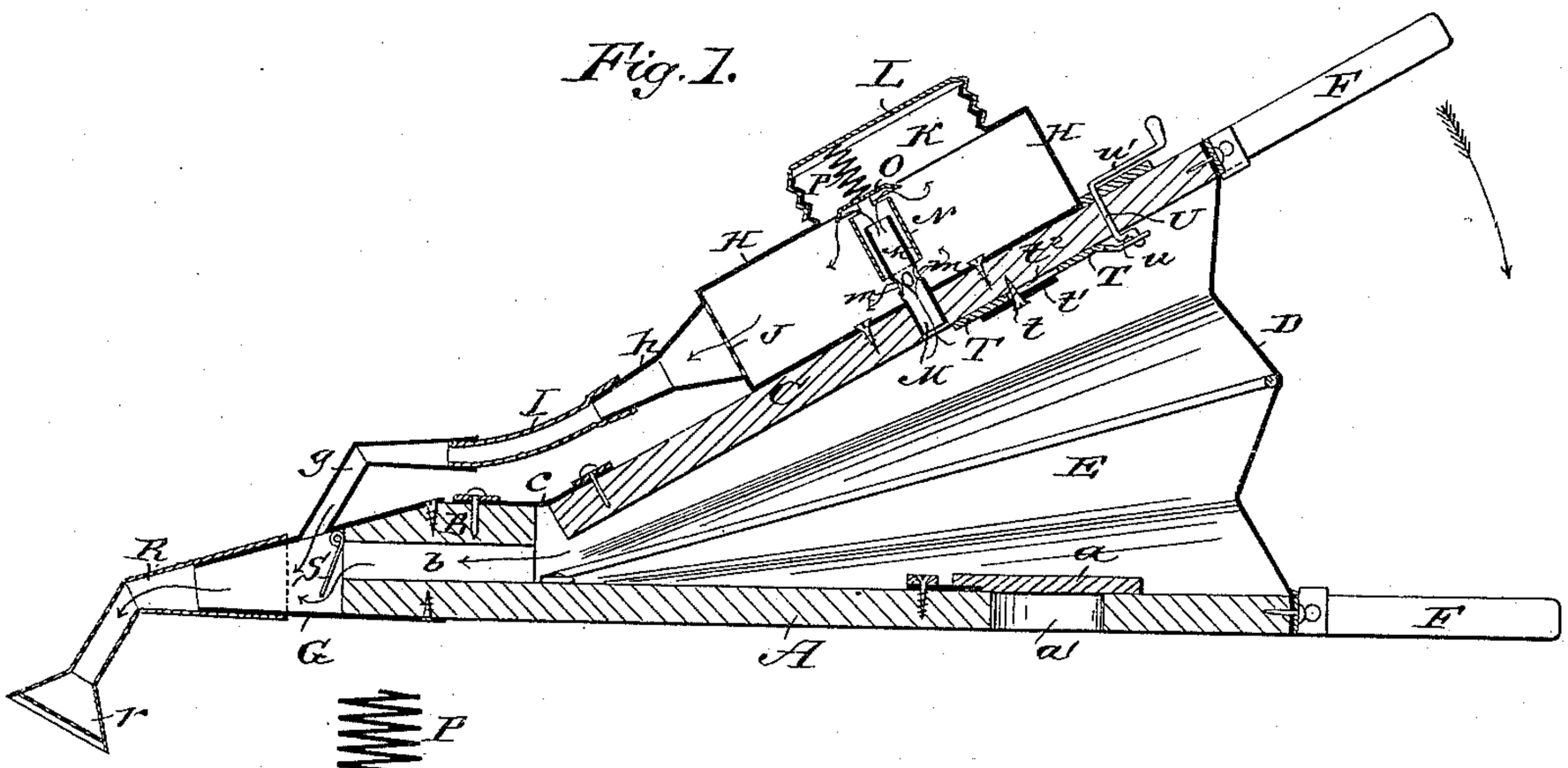


Fig. 3.

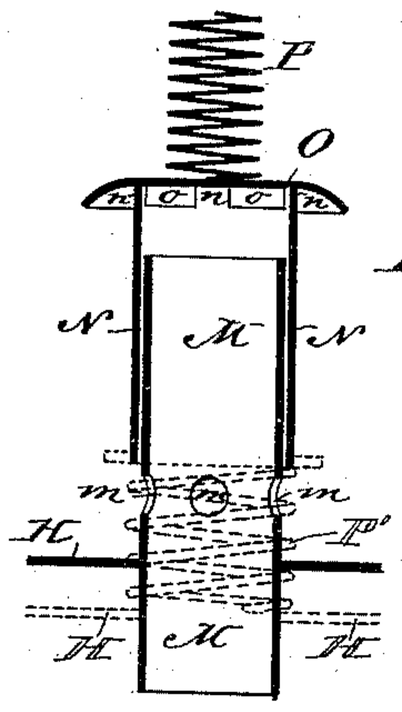


Fig. 2.

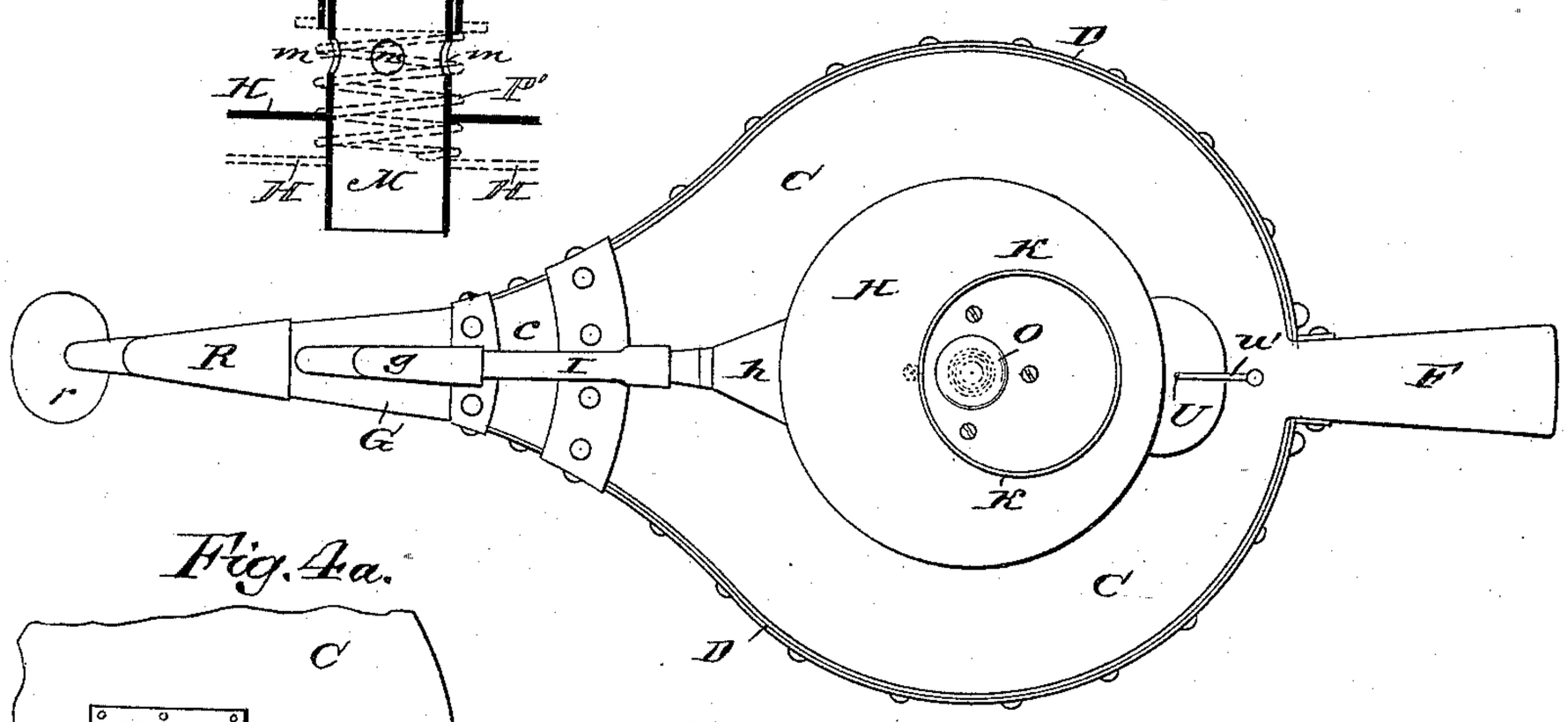


Fig. 4a.

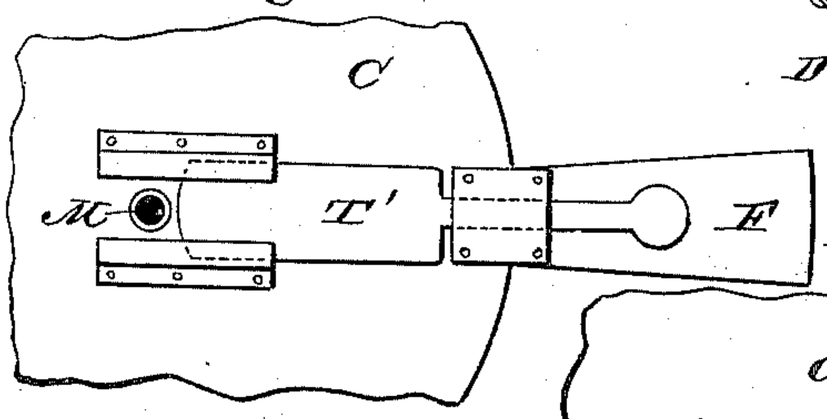
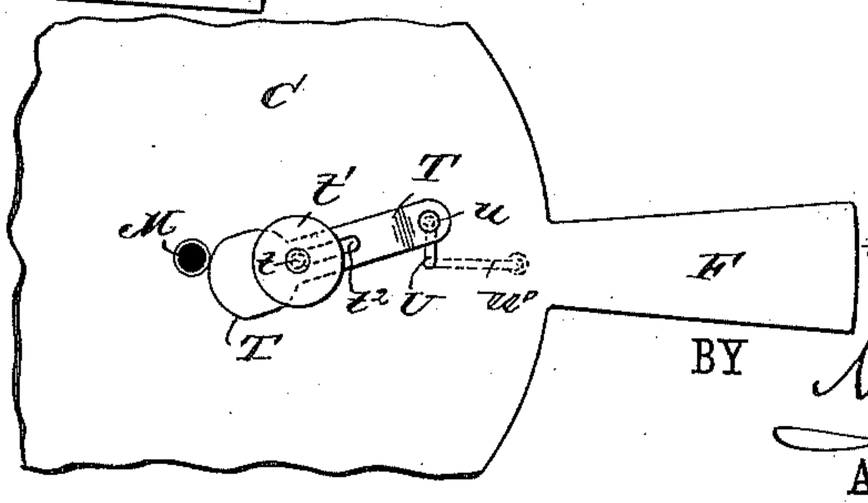


Fig. 4.



WITNESSES:

H. W. Beyer

C. Sedgwick

INVENTOR:

G. T. Campbell

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE T. CAMPBELL, OF SAN FRANCISCO, CALIFORNIA.

BELLOWS.

SPECIFICATION forming part of Letters Patent No. 334,934, dated January 26, 1886.

Application filed July 9, 1885. Serial No. 171,152. (Model.)

To all whom it may concern:

Be it known that I, GEORGE T. CAMPBELL, of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Bellows, of which the following is a full, clear, and exact description.

My invention relates to bellows adapted particularly for discharging sulphur, paris-green, or insect-powder onto trees or plants or about furniture, and also for blowing the loose sand from molds used in casting metals, and for distributing facings over the faces of the molds, the bellows being simple, inexpensive, and durable, and readily adjustable and controllable for the various uses above specified.

The invention consists in certain novel features of construction and combinations of parts of the bellows, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved bellows. Fig. 2 is a plan view thereof, with the cap or cover of the powder-box removed. Fig. 3 is an enlarged sectional side elevation of the check-valve and air-tube of the powder-box, and Fig. 4 is an under side view of part of the top board of the bellows and the air cut-off valve; and Fig. 4ª shows a plain slide-valve.

The letter A indicates the bottom or base-board of the bellows, which has fixed to its forward end the block B, through which is formed the air-outlet passage *b*. To the block B is hinged, by a flexible strip, *c*, the top board, C, to the edges of which and the base-board A is attached the flexible side wall, D, of the air-reservoir E of the bellows.

Inside the base-board A is hinged the flap-valve *a*, over an opening, *a'*, through which the air enters the reservoir E, as the handles F F of the bellows are separated, the air being forced through the passage *b* and metallic nose-piece G, at the forward end of the bellows when the handles are brought toward each other.

The letter H indicates a box or chamber, which is secured to the board C, and is of a size suitable for holding powdered sulphur, paris-green, foundry-facings or other pulverized substance it is desired to scatter or distribute by the force of the volume of air discharged from the bellows-reservoir E at the nose G, the box H being connected with the nose by a flexible tube, I, fitted at one end to a nozzle, *h*, of the box and at the other end to a bent tube, *g*, which opens into the nose G, as clearly shown in Fig. 1. A perforated or wire-gauze partition or plate, J, is fitted at the inner end of the box-nozzle *h*, to prevent choking up of the powder-passages between the box H and nose G by lumps or foreign substances which may by chance be filled into the box with the fine powder through an opening bordered by the screw-neck K, onto which a screw cap or cover, L, is placed to close the box when filled.

To admit the air from the bellows-reservoir E to the powder-box H, I employ a check-valve comprising a tube, M, which is open at both ends, and has side openings or air-passages, *m*, which stand a little above the bottom of the box H, the tube M preferably being fitted at one end into a hole made through the board C of the bellows, as shown.

Around the tube M is fitted loosely an outer tube, N, which has a cap-plate, O, supported at its top by short connecting strips or bars *n*, so as to leave an air-passage, *o*, between the inner face of the imperforate cap-plate O and the top of tube N. A spring, P, held preferably to the cap-plate O, acts between said plate and the applied cover L to force the tube N down to the bottom of the box H, and also force the cap-plate O down on the top of the tube M, so as to prevent passage of the powder from box H into the bellows-reservoir E. Onto the outer end or nose, G, is fitted a spout or nozzle, R, which, preferably, has a rose-head, *r*, through which the powder from box H is discharged.

At S is shown a flap-valve fitted over the air-passage *b*, to prevent the powder from being drawn back into bellows-reservoir E from the nose G, as the reservoir is filled with air.

As thus far described, the bellows is complete as a powder-distributer or insecticide, and its operation is as follows: The powder having been placed in the box H, and the

cover L put on, as the handles F are operated to force the air from the passage *b*, and through the nose G, some of the air will pass into the tube M, and will lift the cap O and tube N against the tension of the spring P, so as to allow the air to enter the box H through the lower passages, *m*, in tube M, and through the upper passage, *o*, thus admitting the air at two levels or places next opposite faces of the box H, and insuring thorough agitation of the powder in the box, and a more effective discharge of the powder therefrom through the tubes I and *g* into the nose G, where the powder is met or overtaken by the main air-blast through the passage *b*, and ejected thereby forcibly from the nozzle R; or it may be directly from the nose G when nozzle R is not used.

When the bellows is intended more particularly for use in distributing foundry-facings upon molds for castings, I will apply a valve, T, at the inner face of the board C, or so it may be operated to close the air-passage M, when the facings, which are placed in box H, are not to be blown upon the molds—as, for instance, when the bellows is to be used for blowing the loose sand from the molds preparatory to discharging the facings upon them.

The valve T may be applied in various ways to effect its purpose. I show it held by a screw, *t*, which passes through an outer supporting-washer, *t'*, and a slot, t^2, of the valve, and I show the back end of the valve connected to one arm, *u*, of a crank-lever, U, which is pivoted in the board C, and has an upper arm, *u'*, above the board, which arm *u'* may be turned to throw the valve T over and close the passage M, when the loose sand is to be blown from the molds, and to open the passage M more or less when the facings are to be discharged from the box upon the molds. The valve T may be used to regulate the blast through the box H when discharging any powdered substance.

The powder-box H may be attached to the base-board A, instead of to the hinged board, and in that case the box may be connected with the nose G by a flexible or rigid tube, as will readily be understood.

I show the nozzle R *r* made in a form allowing it to be placed in the powder-box H when out of use; but the nozzle may have any desired form for any special purpose.

If desired, the spring P may be substituted by a coiled spring, P', which is drawn open and attached at opposite ends to the lower end of the tube N and the bottom of the powder-box, as shown in dotted lines in Fig. 3; and the valve controlling the air-communication between the reservoir E and powder-box H may be a plain slide-valve, as at T' in Fig. 4ª, with an end part projecting outside the reservoir, under the upper handle F, by which it may be pushed in or drawn out to cover the passage M or uncover it more or less as required.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A bellows comprising a collapsible air-reservoir, a powder-box held thereto and communicating therewith, a passage from the powder-box to the air-discharge end or nose of the bellows, a check-valve controlling the direct-air passage from the reservoir to the powder-box, and a spring acting normally to close said valve, substantially as herein set forth.

2. The combination, in a bellows, of the collapsible air-reservoir, outlet *b*, powder-box H, a check-valve fitted thereto and comprising a tube, M, apertured at *m*, a tubular cap, and a spring, P, and a passage from box H to outlet *b* or its nose G, substantially as herein set forth.

3. The combination, in a bellows, of the collapsible air-reservoir, outlet *b*, powder-box H, a check-valve fitted thereto, and comprising a tube, M, open at both ends and apertured at *m*, a tubular cap, N O, provided with passage *o* under plate O, and a spring, P, and a passage from box H to the outlet passage G, substantially as herein set forth.

4. The combination, in a bellows, of the collapsible air-reservoir, outlet *b*, powder-box H, check-valve M N O P, a flexible tube, I, connecting box H with the nose G or a tubular offshoot therefrom, a check-valve, S, and a valve, T, substantially as herein set forth.

5. A bellows comprising a collapsible air-reservoir, a powder-box held thereto and communicating therewith, a passage from the powder-box to the air-discharge end or nose of the bellows, and a valve, as at T, substantially as herein set forth.

6. The combination, in a bellows, with the collapsible air-reservoir, powder-box H, and a passage from said box to the air-discharge end or nose of the bellows, of a valve, T, slotted at t^2 and pivoted at *t*, and a double-armed crank-lever U *u u'*, substantially as herein set forth.

GEORGE T. CAMPBELL.

Witnesses:
E. H. THARP,
W. S. FOSTER.