Sheet 1. 2 Sheets.

C. Danforth.

Drawing Head for Spinning.

No. 6,014.

Patented Jan. 9, 1849.

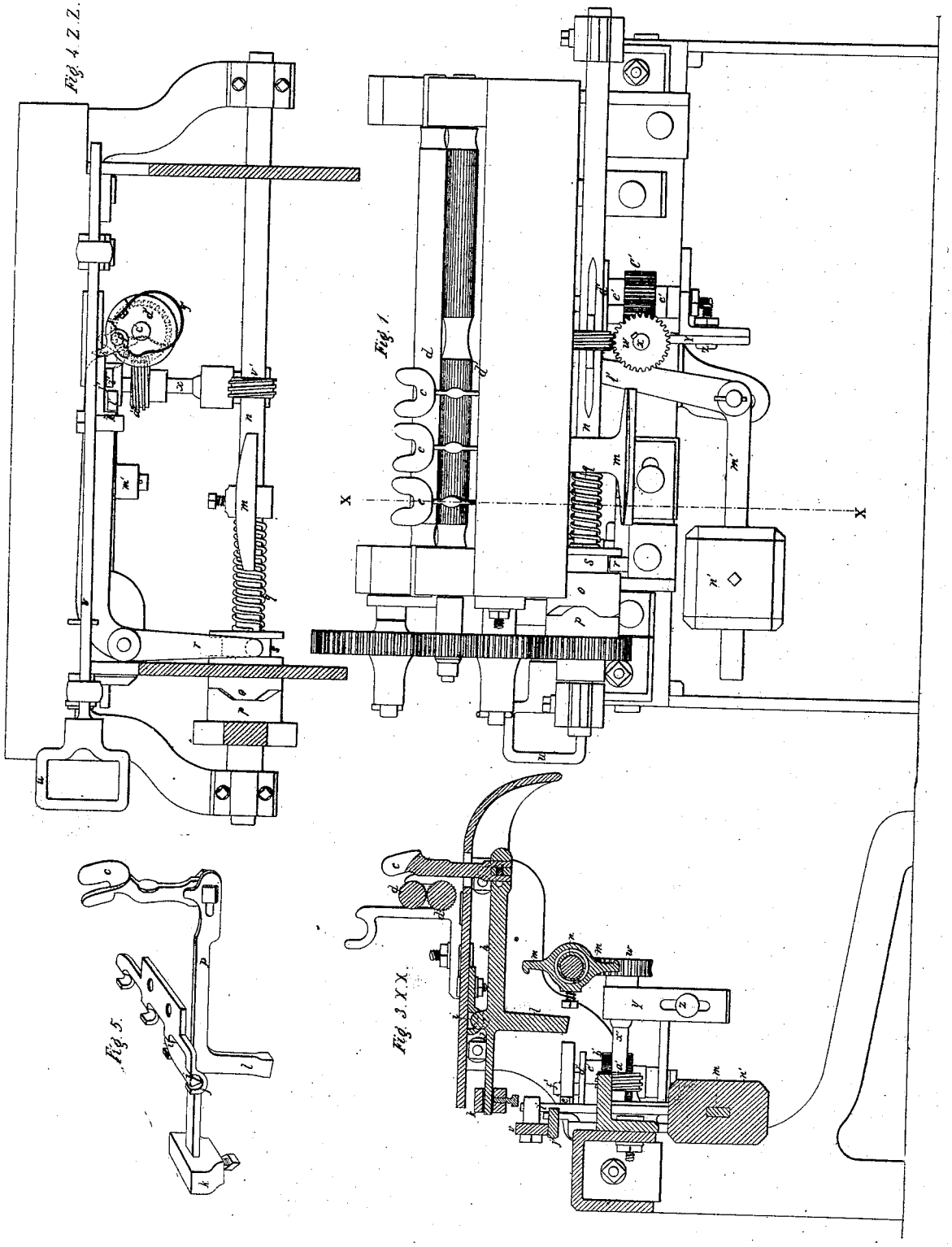

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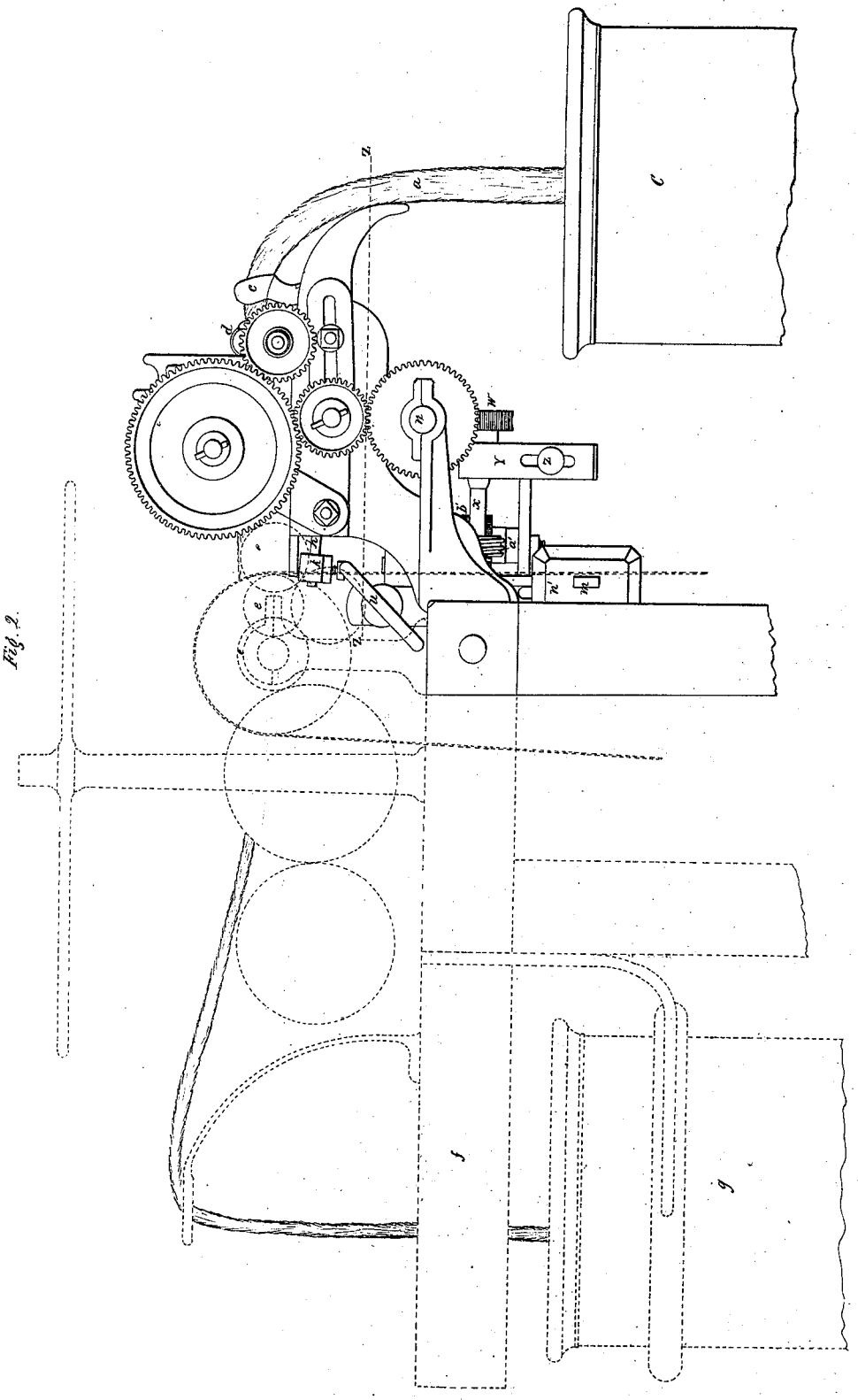
Fig. 2.



UNITED STATES PATENT OFFICE.

CHARLES DANFORTH, OF PATERSON, NEW JERSEY.

STOP-MOTION FOR DRAWING-FRAMES.

Specification of Letters Patent No. 6,014, dated January 9, 1849.

To all whom it may concern:

Be it known that I, CHARLES DANFORTH, of Paterson, in the county of Passaic and State of New Jersey, have invented new and useful Improvements in Drawing-Frames or Heads for Drawing Cotton Roving or Slivers, and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a back elevation of my improvements; Fig. 2, an end elevation of the same as applied to a drawing head; Fig. 3, a vertical section taken at the line *x x* of Fig. 1; and Fig. 4 a horizontal section taken at the line *z z* of Fig. 2.

The same letters indicate like parts in all the figures.

My improvements although applicable to all kinds of drawing frames or drawing heads, are specially intended and adapted to drawing frames or heads, in which the improved coiling can is used.

My first improvement, relates to the mode of stopping the machine, whenever any one of the rovings gives out, that another may be supplied, and thus keep all the parts of the drawing frame equally in action, that each can may receive an equal quantity of rovings. And my invention consists in making use of the weight of the rovings to act on a balance lever guide which when liberated by the giving out of any one roving, will fly up and bring an arm in contact with a fly connected with a sliding clutch that shifts the belt onto the loose pulley and thereby stop the whole drawing frame until a new roving can be supplied, or the old one spliced. And the second part of my invention relates to the employment of a regulated stop motion connected with the belt guide, which at a given time (determined by the size of the cans and the number of the roving or spring) will stop the drawing frame, to prevent too great a quantity of roving or sliver from being coiled and packed in the cans. And this part of my invention consists in the use of a flying trigger, or cam on a rotating shaft receiving motion from the main or any other shaft, which at the end of the operation of the machine, is gradually forced back, and when liberated forces out a catch lever that holds the weight or spring lever by which the belt guide is shifted and at the same time flys beyond the end of the catch lever that the belt guide may be immediately shifted back to start the machine at once, without waiting for the spin or trigger to have rotated sufficiently far to clear the catch lever, as would be the case from the necessarily slow motion of this shaft, if the spin was permanently attached to this shaft.

In the accompanying drawings the red lines represent a drawing frame with the well known improved coiling cans, and the full lines represent my improvements as applied to such drawing heads, but which can be equally well, and in the same manner, applied to all other drawing frames or drawing heads, whether for drawing rovings or ropings. As the improved coiling cans for drawing frames have been patented, and they as well as drawing frames are in general use, it is deemed unnecessary to give a description of them, and they are only so far shown by the red lines in the drawings as to facilitate the description of my improvements and their application.

The object of the coiler is to pack the rovings in the can, but if these be packed too closely in the can, that is if the machine or the supply be not stopped in time, the rovings or ropings will be packed too closely in the cans and be injured thereby, hence, it is important that the operation of the machine should be stopped at the required and given time, and that each can should be supplied with an equal quantity of roving or roping that the packing may be equal in all the cans. And although it is important in all drawing frames that the operation should be regular, yet it is much more important when a coiler or other packer is used for laying the rovings or ropings in the cans.

The rovings (*a*) are taken from cans (*b*) in the usual manner, and carried through guides (*c*) to the rear set of rollers (*d*) and from these they pass through the drawing rollers (*e*) to the coiler (*f*), and from thence to the rotating cams (*g*).

The guides (*c*) are made with openings for the passage of the rovings or slivers, longer than usual, as they depend on the weight of the rovings for their action instead of the drag of the rovings through them as heretofore, which has an injurious effect if the openings be too small, and which often fails to act if too large. Each guide

(c) is attached by an adjusting screw bolt on one end of a lever (h) provided with trunnions (i i) (see also Fig. 5) that rest with knife edges in boxes (j) attached by screw bolts to the under side of the top plate of the frame, each plate containing the boxes for one set of guides.

The rear arm of the lever (h) is provided with a sliding adjustable weight (k) to admit of so adjusting the balance that the moment the roving does not rest on the guide, it will rise by the preponderance of the weight on the other end. This lever has a right angle arm (l) which when the guide is thrown up, is brought within the range of the rotation of a fly or wing (m) and stops it. This fly or wing (m) is attached to the shaft (n) of a clutch (o) a helical spring (q) coiled around the shaft, being employed to keep the clutch closed, but as the cogs of the clutch are inclined, when the fly or wing is arrested, the continued rotation of the loose part (p) of the clutch causes the sliding part (o) of the clutch to slide and to vibrate a lever (r) one end of which is forked to embrace a groove (s) of the clutch and the other to catch onto the sliding bow (v) of the band guide (u) which shifts the band from the fast to the loose pulley of the drawing head in the usual and well known manner. In this way it will be seen that the moment one of the rovings gives out, the guide through which it passes will rise and stop the operations of the drawing head, that another roving may be supplied and the machine again started.

As the levers of the guides rest and turn on knife edges their movements will be very sensitive, and the parts are so arranged that the action of the fly or wing of the levers does not bear in any manner against these knife edges, but on the contrary the arm of the levers being vertically below the knife edges, when the fly acts on the arms, it forces the upper surface of the trunnions up against the plate to which the boxes are attached, thus avoiding all injurious action on the knife edges.

The shaft of the clutch is provided with a worm (v') the thread of which actuates a cog-wheel (w) on a short axle (x) that has its bearings in a bracket piece (y) connected with the frame by screw bolts (z) that the axes of the arber may be moved nearer to or farther from the shaft of the clutch, that the wheel (w) may be shifted and others of greater or less diameter substituted, when it is desired to adapt the machine to various kinds or qualities of rovings. The arber (x) is also provided with a worm (a') the threads of which turn a cog wheel (b') on a vertical arber (c') that has a plate (d') at the upper end, and to the face of this plate, and near the periphery thereof is a fly trigger (e') that turns on a fulcrum pin (f') with a spring (g') the tension of which keeps it (the trigger) in the position represented in the drawings.

This trigger has a cam-like projection (h') which as the arbor is rotated by the connections described, comes in contact with a projection (i') of the bracket or frame, which causes it to turn on its fulcrum pin until it assumes the position represented by the red lines; it then passes this projection from which it slips and strikes the end of the arm (j') of the lever (l') and forces it out of far enough to carry or catch projection (k') on it beyond the arm (l') of a weighted lever (m') which is thus liberated, that the weight (n') on it may actuate the lever (m') which being in connection with the bar (v) of the belt guide, shifts the belt onto the loose pulley of the drawing head and stops the whole mechanism.

So soon as the trigger has forced out the lever (j') its cam-like projection (h') passes by the end of the lever and being thus liberated the tension of the spring forces it beyond the reach of the end of the lever, so that the instant afterwards the belt can be shifted back to restart the machine without the necessity of waiting until the cam should be carried around by the necessarily slow rotation of the arbor which carries it. Without this turning cam trigger it will be obvious either that the arbor which carries it should rotate with great velocity, (which cannot be done as it must act but once for each filling of the cans) that is each complete operation of the drawing head, or else much time would necessarily elapse between the stoppage of the machine by the shifting of the belt and the passage of the can as far as to admit of the reshifting of the belt, but by the use of a flying trigger the parts can be restored instantly.

It will be evident to any one skilled in mechanics, that instead of the spring for forcing out the flying trigger, or weight may be substituted, by having the weight suspended to an arm of the trigger and hanging down in a hollow arbor, or otherwise connected, and also that the trigger can be variously formed and placed on a horizontal or inclined arbor instead of a vertical one; but I have described and represented the form and arrangement which I have essayed with success and deem the best. It will however be understood that I do not wish to confine myself to this form and arrangement, but to vary them at pleasure so long as I retain the principle or character of my invention, which is the use of a flying trigger, that flies beyond the range of the lever so soon as it has pushed it far enough for the liberation of the belt shifting apparatus to admit of readily reshifting the belt.

The advantages of using the weight of

the roving, and the tension consequent on its weight for holding down the guide, instead of the drag of the roving in passing through a narrow guide, will be appreciated when it is taken into consideration that on the old plan the rovings are compressed in one direction in passing through the guide, and then compressed at right angles thereto immediately afterwards in passing between the back rollers of the drawing head, this compound compression having as experience has shown, an injurious effect on the rovings, and when it is also considered that the action is very uncertain when the drag is depended upon, for if there be any irregularity in the rovings, whenever a reduced part passes through the guide the drag on the guide is insufficient and the machine is stopped without necessity, thus occasioning a great waste of time; but by substituting the weight of the rovings, so long as they do not give out, the machine must continue to operate.

From this it will be seen that, although I have described the arrangement which I have found on experiment to answer a good purpose, yet this may be varied at pleasure so long as the leading principle or character pointed out is retained.

What I claim as my invention and desire to secure by Letters Patent is—

1. The method substantially as herein described of stopping the operation of drawing frame or drawings heads by means of guides each of which is attached to an end of a horizontal balance lever so that they shall be kept down (to permit the drawing head to operate) by the weight of the roving, and fly up to stop the machine the moment they are relieved of the weight of the rovings, as described.

2. I also claim the imployment of a flying trigger, substantially as described, in combination with the apparatus for shifting the belt or any other substantially the same, as described whereby, the trigger flies past the end of the catch lever, to permit the mechanism that shifts the belt to be reset without delay, as described.

CHAS. DANFORTH.

Witnesses:
CHAS. M. KELLER,
ALLEN P. BROWNE.