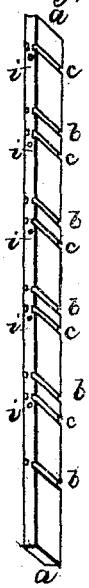
E. Morris.

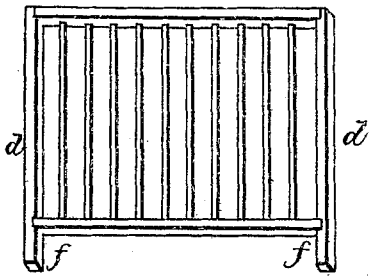
Frame for Feeding Silk Worms.

No. 2,130. Patented Jun. 16, 1841.

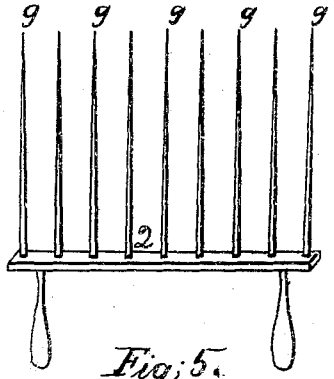
Fig; 1



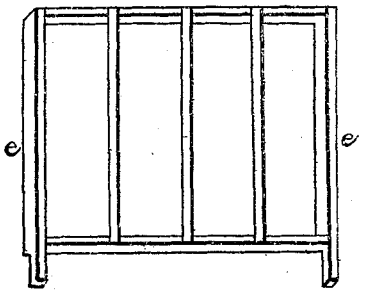
Fig; 2;



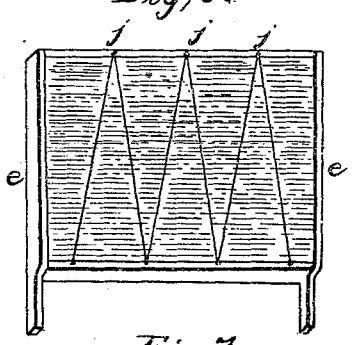
Fig; 3;



Fig; 4;

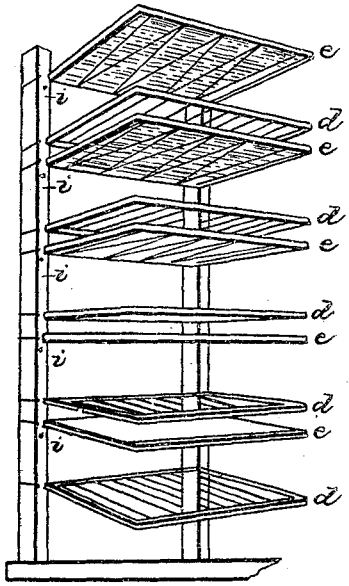


Fig; 5.



Fig; 6;

Fig; 7;



UNITED STATES PATENT OFFICE.

EDMUND MORRIS, OF BURLINGTON, NEW JERSEY.

APPARATUS FOR AND MODE OF FEEDING SILK-WORMS.

Specification of Letters Patent No. 2,130, dated June 16, 1841.

To all whom it may concern:

Be it known that I, EDMUND MORRIS, of the city of Burlington, in the county of Burlington and State of New Jersey, have invented a new and Improved Apparatus for and Mode of Feeding Silk-Worms; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists in providing certain posts or uprights, frames, roofs, and a clearing fork, which when arranged according to my description, enable me to feed the silk worms so that they clean themselves, to maintain a perfect local ventilation of the bed or spot they are feeding on, to greatly reduce the expense of feeding, to identify the age, from the spinning, of any number of cocoons, and should cleaning ever become necessary, to clean them in much less time and with much less labor, while the whole apparatus is portable. I call it the "Burlington Silk Worm Frame."

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The Burlington silk worm frame consists of two upright pieces of plank or scantling, (similar to *a*, *a*, Figure 1), 6 inches wide by 2 inches thick, fastened to the floor and ceiling. These uprights are to be placed 4 feet apart. They are supplied with grooves on each side $1\frac{1}{8}$ inches wide, cut half an inch deep, and placed directly opposite to each other. These grooves may be formed by either cutting them in the uprights, or by fastening on cleats, and they will correspond in number and position to the number of levels of feeding frames and roofs which the culturist intends to adopt. The figure represents an upright properly grooved to accommodate 5 feeding frames in the grooves *b*, *b*, in 5 roofs in the grooves *c*, *c*. The first feeding frame *d* is placed in the lowest groove, then a roof *e*, then another frame, and so on up, ending with a roof at the top (Fig. 7) which top roof may approach to within 2 or 3 inches of the ceiling. The first or lowest groove should not be made less than 12 inches from the floor. Let there be 12 inches clear to the next groove above, then 3 inches clear to the 3d groove, and so on up to the ceiling. These distances may be lessened or increased, but they should not be so much lessened as to prevent a brush from running in below the feeding frame and sweeping off from the top of the roof below the dirt which may fall from the frame above, or to prevent a copious circulation of air upward.

At the first or lowest level or groove, the feeding begins, the dirt from that level falling to the floor of the cocoonery. The silk worms having been kept in bulk, as usual, until after the third molting, the only critical period of their existence has arrived, when they are to be placed on the feeding frame, which is represented separately in Fig. 2. This frame is made of stuff, (wood) an inch thick by $1\frac{1}{2}$ inches wide, and is 4 feet long by 3 feet wide, the ends *f*, *f*, however, projecting 6 inches longer, in order to form pins to run into the grooves. Ten slats, or more or less, run across it, each about $\frac{3}{8}$ to $\frac{1}{2}$ inch square, or they may be round, the ends of which are inserted into holes in the sides of the frame. Let the ends *f*, *f*, be run into the grooves *b*, *b*, and the entire frame is thus firmly suspended in the air, securing to the worms feeding upon it the important advantage of being as well ventilated underneath as overhead. When the frame is thus suspended, cover it very slightly with straw, merely to give the worms a foothold when first put on, that they may not drop through. The straw is of no other service. Now having previously laid branches on the worms, take up the branches and lay them on the straw until you have as many on the frame as it will accommodate. The straw is to be put on the whole range from end to end, covering the small opening where two frames meet. Several frames thus combined become a continuous frame, divided into sections of 4 feet, the worms covering the whole surface, and having but two ends, no matter what may be its length. The feeding is to be continued by laying on the branches so as to cross each other, in various ways, thus preserving to the whole mass the character of a riddle, and insuring a continual current of air passing upward through the whole. But should the stems of the branches fed out to the worm, become piled up on the frame so high as to need removal, either from carelessness, excessive feeding, or any other cause, I accomplish the removal by taking what I call a clearing fork, (Fig.

3) made with smooth and nicely pointed teeth, *g*, *g*, either of wood or metal, inserted firmly in a head *h* 4 feet long, the teeth being 3 feet long, and gently insinuating the latter into the mass of stems about an inch or two below the worms, and running them through to the other side, I lift up the whole surface thus fixed on the fork, and secure the latter by running the two outer teeth into holes *i*, *i*, bored in the uprights for that purpose (see Fig. 1). A pair of such holes is provided for every level. I then take out the frame, empty the rubbish, replace the frame, lower the fork on it, and gently withdrawing it, the worms are left without disturbance on a clean frame. No fresh straw is necessary. The forks may have handles about 18 inches long, to make the purchase greater in lifting the worms up. Above this feeding frame, say one foot, a spinning roof *e*, *e*, (Fig. 5) is suspended in another pair of grooves *c*, *c*, exactly as the frame is suspended. The skeleton of a roof is shown in Fig. 4, as it appears previous to the muslin top being put on. This roof is 4 feet long and 38 to 40 inches wide, or 2 to 4 inches wider than the frames, so as to catch all the dirt, worms and litter which may fall from the frame above, and prevent their falling on the frame below. The roof I make of half inch stuff, the sides and end pieces 2 inches deep, 4 feet long by 38 to 40 inches wide, and braced with 3 common plastering lath, or similar light stuff, running across from one side to the other, and let into the sides. On the edges of the frame composing the roof, I drive a few tacks, or cut a slit or kerf with a saw instead of each tack see *j*, *j*, (Fig. 5,) around or through which tacks or kerf, I draw a string several times, so as to run across the roof, and keep in its place the loose straw in which the worms are to spin their cocoons. The roof I cover on its upper side, with muslin or pasteboard, or other suitable stuff. Three inches above this spinning roof, I place another frame similar to that first described, and above that another roof, and so on up to the ceiling, as shown in Fig. 7.

When the worms show signs of being ready to spin, I cause them to mount into the spinning roofs by the following contrivance. I take a strip of wood, say an inch square, and 10 to 20 feet long, more or less, as the length is not important. I plug it with the stems of old multicaulis trees, that are dead and perfectly dry, leaving the branches to project right and left only, like the sticks of a fan, (Fig. 6) and the stems all the same length. I suspend this by the ends, in leather or other kinds of loops fastened to the ends of the spinning roofs, letting the stems touch the frames. I put two to four of these mounting ladders down the length of the range of frames; they present a multitude of points for the worms to mount at, and can be looped up in very little time. I do not plug the stick or pole so close as to prevent my feeding the slow worms on the frame. When the worms begin to mount, I mark the day on the front of the roof, and at the end of 3 days, it being portable, I take it down and set it aside for 3 days more. If the worms on the frame below it have not all gone up, I convey them to another frame. The roof taken down and set aside, will thus contain the cocoons formed during the three days it remained up. As a cocoon is fully ripe and fit to gather at the end of four days, I thus know the age of all my cocoons, to a certainty—viz.—the cocoons of the first day's mounting are six days old; those of the second day's mounting are five days old, and those of the third are four days old. I then clear out the roof, refill it with fresh straw, and it is ready to be used again.

Fig. 7 represents two uprights with 5 levels of frames and 5 of spinning roofs. The uprights are to be extended right and left, to the extent of the room or cocoonery, and the dimensions of all the parts of the whole apparatus may be varied at pleasure.

What I claim and desire to be secured by Letters Patent, are as follows:

1. I claim the manner of constructing the within described apparatus, or frame, for feeding silk worms, that is to say, I claim the combining together of a series of feeding frames and of roofs, by sliding the end pieces of the same, extended out for that purpose, into grooves made in uprights, which may extend from the floor to the ceiling of the room; said feeding frames and roofs having such uprights at their backs only, and forming a continuous and unobstructed range in front of them, along the whole, or any desired portion of the apartment, without the intervention of uprights or supports of any kind, so as to admit of the operations of feeding and cleaning being carried on with perfect facility; the respective parts being arranged and combined substantially as herein set forth.

2. I claim the method of cleaning the worms, when necessary, by the employment of the cleaning fork herein described by which I lift up at once the entire surface on which the worms may be feeding, so as to clean them without waiting, as the practice has been, for the worms themselves to mount up into fresh foliage and so as to allow the mass of stems and foliage to be promptly removed.

3. I claim the within described manner of forming the portable straw spinning roof, in which the worms are to form their cocoons, and by the portability of which I am

enabled to identify the age, from the spinning, of any number of cocoons, the gathering of which is thereby greatly facilitated, while their value is not endangered by being kept too long ungathered; the said spinning roof serving the double purpose of catching the litter from above, as it falls from the frame, and of affording a suitable place for the worms to spin in as they rise from the frame below.

EDMUND MORRIS.

Witnesses:
I. O. GOODE,
I. L. TORRELL.