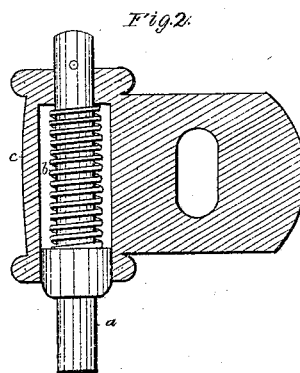
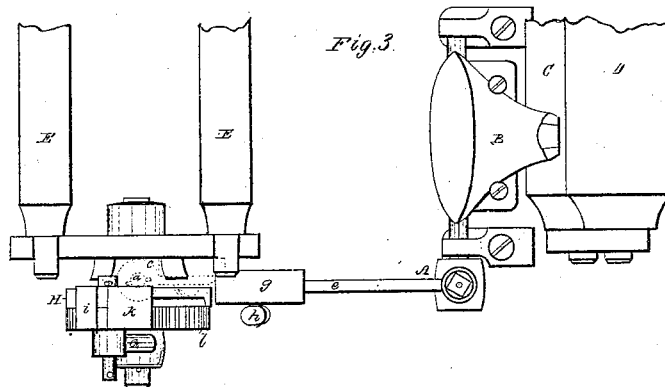
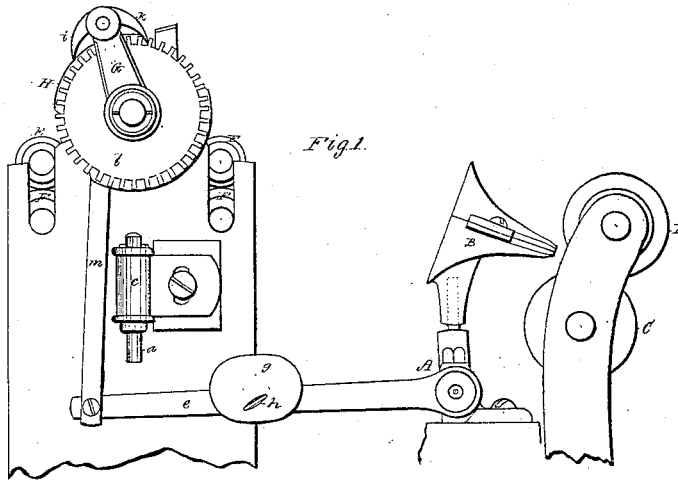


G. Draper,
Drawing Frame.
No. 110,556. Patented Dec. 27, 1870.



Witnesses.
S. A. Piper
J. R. Snow

George Draper.
by his attorney.
R. W. Ledy

United States Patent Office.

GEORGE DRAPER, OF HOPEDALE, MASSACHUSETTS.

Letters Patent No. 110,556, dated December 27, 1870.

IMPROVEMENT IN DRAWING-FRAMES.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, GEORGE DRAPER, of Hopedale, of the county of Worcester and State of Massachusetts, have made a new and useful invention having reference to what are termed "Drawing-Regulators" for Spinning Machinery; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 denotes a side elevation of what is herein-after termed the "reinforce," and those portions of a drawing-regulator to which it is applied and with which it immediately operates; the nature of my invention consisting in the combination of such reinforce, or its equivalent, and the drawing regulator.

Figure 2 is a vertical section of such reinforce.

Figure 3 is a top view of the machine, or parts of a drawing-regulator, to which the reinforce is applicable; they constituting portions of the well-known Wyly's drawing-regulator.

In this drawing-regulator a vibratory trumpet is employed, with a mechanism usually termed an "evener," the whole operating to change the draft of the drawing-rollers of the spinning-machine, as the thickness of the sliver in the trumpet may either increase or diminish relatively to the standard of thickness.

Such a vibratory trumpet is described in Pray and Stafford's patent of November 12, 1846. It is also shown in the drawing-regulator patented by Whiting Hayden, March 12, 1850. Also, in a modified form, in that patented by Newell Wylys on January 28, 1851, such patent having been reissued on July 12, 1864, and since extended for a further term of seven years. For like purposes such a trumpet has been used in other machines. In most, if not in all cases, except in the Wyly's drawing-regulator, the trumpet has been subjected to the action of a weight, or its equivalent, operating against the pressure or draft of the sliver upon the trumpet, and with the same, or nearly the same force, whether the trumpet be pressed to its extreme of forward motion, or, in consequence of the sliver being of not sufficient thickness, being allowed to fall back to its other extreme of motion or to any position between the two.

The object of my invention is to produce a sliver of even thickness, and thus insure a thread of even diameter, or a better approximation thereto than usually results from the patented mechanisms to which reference has hereinbefore been made.

It must be borne in mind that the distance of vibration of a trumpet of a draft-regulator is confined to about the length of the staple of the cotton or fibrous material, because there has to be such a degree of condensation of the sliver in the trumpet as would cause the sliver to pull apart were the mouth of the trumpet at a distance from the bite of the calender-

rollers greater than the length of the staple. In most cases the extent of vibration of the trumpet, when in action on a cotton-sliver, will not exceed three-fourths of an inch.

Though in Wyly's regulator the trumpet turns on a pivot and is mounted on a vibratory arm, such an arrangement of the trumpet fails, in practice, to overcome the difficulty, which it is the purpose of my invention to prevent. Although Wyly's draft-regulator has gone into very extensive use, his mode of supporting and operating the trumpet has mostly been abandoned and others substituted.

With the vibratory trumpet now in general use the weight operates with nearly equal force in whatever position the trumpet may be within its limits of motion, the sliver, when of the right size or thickness, causing the trumpet to assume its medial position, the mechanism for changing the relative speed of the draft-rollers being at rest.

When the sliver in the trumpet is too large or thick it will overcome the resistance of the weight and press the trumpet forward, and set at work the evener or mechanism so as to increase the draft until the sliver may be properly reduced.

So when the sliver in the trumpet may be too small or not of sufficient thickness the weight will effect a retraction of the trumpet, and set the mechanism at work to lessen the draft, so as to increase the size or thickness of the sliver.

Such is the theoretical action of the parts, but, in practice, when the size of the sliver is increased, owing to the condensed condition of the cotton in the trumpet, the latter will be pressed or drawn forward toward the calender-rollers, often with great power, and there kept, the mechanism to change the draft of the sliver operating to its full capacity, until the sliver becomes too small, in which case the effect will be to let the trumpet fall back past the medial position, the results being an uneven sliver. When the sliver is too light the power to change the trumpet is much less in proportion; consequently, when at its extreme position, it will not stay too long as it will when at its forward extreme, for as soon as the trumpet may become full it will move forward with the sliver. Greater trouble comes from making the sliver lighter rather than heavier, with respect to the standard size, for if heavier there is a waste of stock, which may result in a slight imperfection not detrimental to the strength of the fabric; but in case the sliver is not thick enough the thread or yarn made from it will be too fine, and, as a consequence, its strength will be proportionally impaired. Having less fiber the thread or yarn will require more twist to impart to it the necessary strength; therefore a sliver when made too small will produce an imperfection in the woven fabric made of it.

In order to prevent the sliver, when too large, from

keeping the trumpet drawn forward too long I employ what I term a "reinforce," which, as represented in the drawing, consists of a slide-rod, *a*, and an encompassing helical spring, *b*, inclosed or arranged in a case or socket-piece, *c*, such mechanical parts being arranged directly over the weighted arm *e* of the lever *A*, by which the vibratory trumpet *B* is supported, and to the shorter arm of which it is pivoted.

The slide-weight of the lever is shown at *g*, as provided with a set-screw, *h*.

C and *D* are the calender-rollers.

E E and *F F*, the sets of draft-rollers.

G, the vibratory arm, carrying the two pawls *i* & *k* to operate with the gear *l*.

H is the flanged disk or rocker-plate, arranged aside of the gear, and connected with the weighted arm *e* by a connection-rod, *m*, pivoted to the arm, and to a crank-pin projecting from the said rocker-plate, all the several parts above mentioned and referred to, with the exception of the reinforce, being well-known portions of a draft-regulator of the kind mentioned as in common use, the remaining parts of the regulator not being exhibited, as they are or will be well understood by persons skilled in the art to which my invention appertains.

The said reinforce is to be arranged so as not to come into operation on or be met by the weighted arm until the trumpet in advancing may have just passed its medial position. The effect of the reinforce is to prevent the trumpet from staying fully forward until the sliver may be rendered too small. As soon as the trumpet may advance beyond its medial position its weighted arm will be raised up against the lower end of the slide-rod of the reinforce and be estopped by the action of the spring connected at its lower end with such rod, and at its upper end supported against the top of the case in which such spring is situated.

I have contemplated other ways of making a reinforce and applying it to the trumpet or its lever. It may be like a common spring or a spring-balance attached to the trumpet-lever and the supporting-frame, or it may be composed of a slide-rod pendent from the lever and provided with a shoulder or head at its lower end, and arranged to extend through a series of weights disposed on a platform, so that, on the rod being elevated by the lever, such weights may be lifted suc-

cessively. All such may be viewed as different methods of carrying out my invention or applying to a draft-regulator of a spinning-machine a reinforce to produce the desired effect, as hereinbefore set forth.

I prefer the reinforce as represented, because I have discovered that a sliver, when too coarse, operates the draft-regulator differently, and requires different treatment from what is the case when the sliver is too fine. First, less harm results from the sliver when too coarse than follows when it is too fine. Second, when it is too coarse it is sure, without the reinforce combined with the draft-regulator, to be reduced too much before the operation of reduction may cease; whereas, for reasons hitherto given, such is not the case where the sliver is too fine.

With my invention the draft-regulator is allowed to operate freely, when the sliver may be too light, the movement of changing the draft being hindered and obstructed only when the sliver may be too heavy, (except when very much so,) such amount of reinforcement or resistance being employed as may be necessary to prevent over action when the sliver may be too heavy. With my invention practice has demonstrated that an even or much better sliver can be produced.

Suppose, when the standard size for the sliver is one hundred grains to the yard, the sliver, by the addition of a card, comes to the trumpet with a size corresponding to one hundred and ten grains to the yard, the effect would be to instantly press the trumpet forward to its extreme point in spite of the elastic reinforce, thus causing the draft-changing mechanism to operate to its full capacity until the sliver may be reduced to perhaps one hundred and two grains per yard, when the reinforce or expansive power thereof coming into action with the weight of the trumpet-lever will gradually depress the said lever and return the trumpet to its medial position, when the sliver may have attained its proper size.

I claim—

The combination of the reinforce with the sliver draft-regulator, all being substantially as described.

GEORGE DRAPER.

Witnesses:

R. H. EDDY,
S. N. PIPER.