

May 1, 1928.

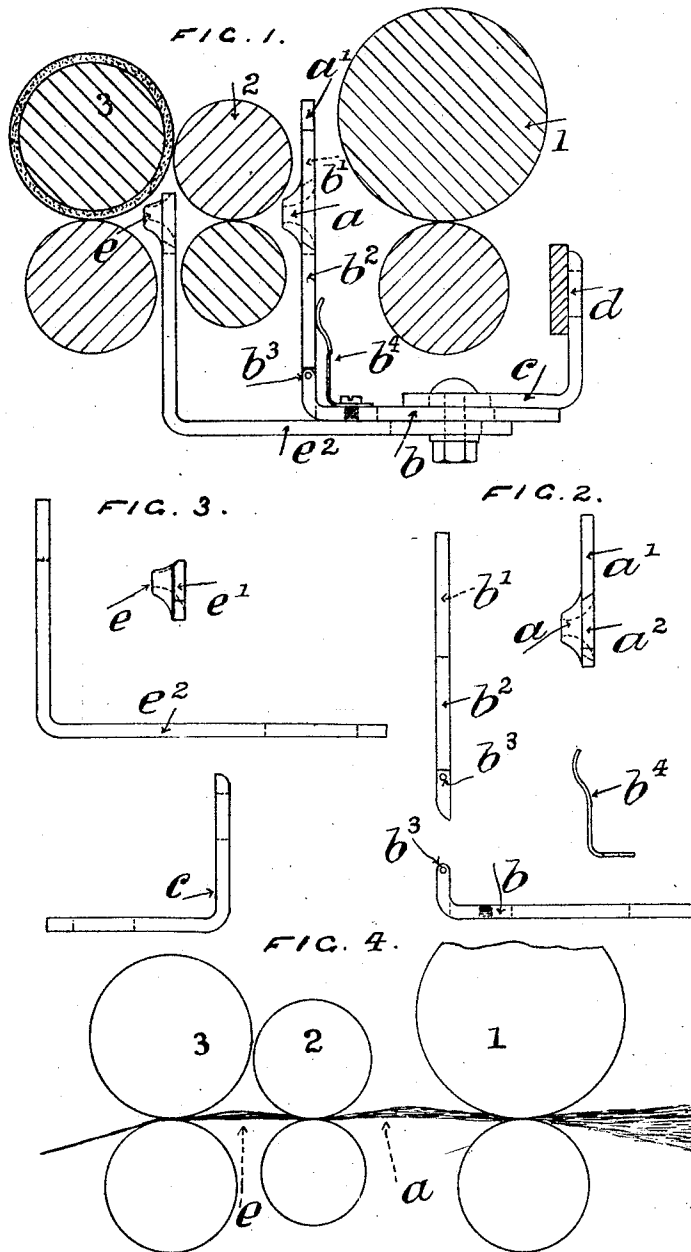
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1,668,333

HIGH DRAFT SPEED FRAME FOR DRAWING, TWISTING, AND WINDING TEXTILE MATERIALS

Filed Nov. 30, 1926

6 Sheets-Sheet 1



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May 1, 1928.

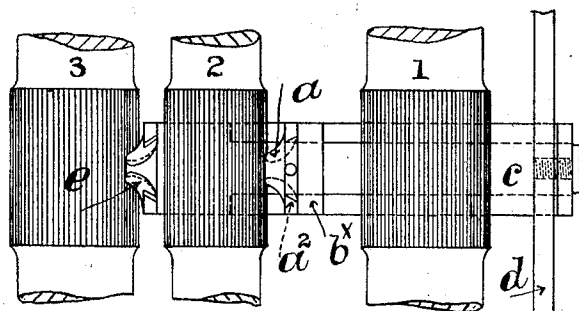
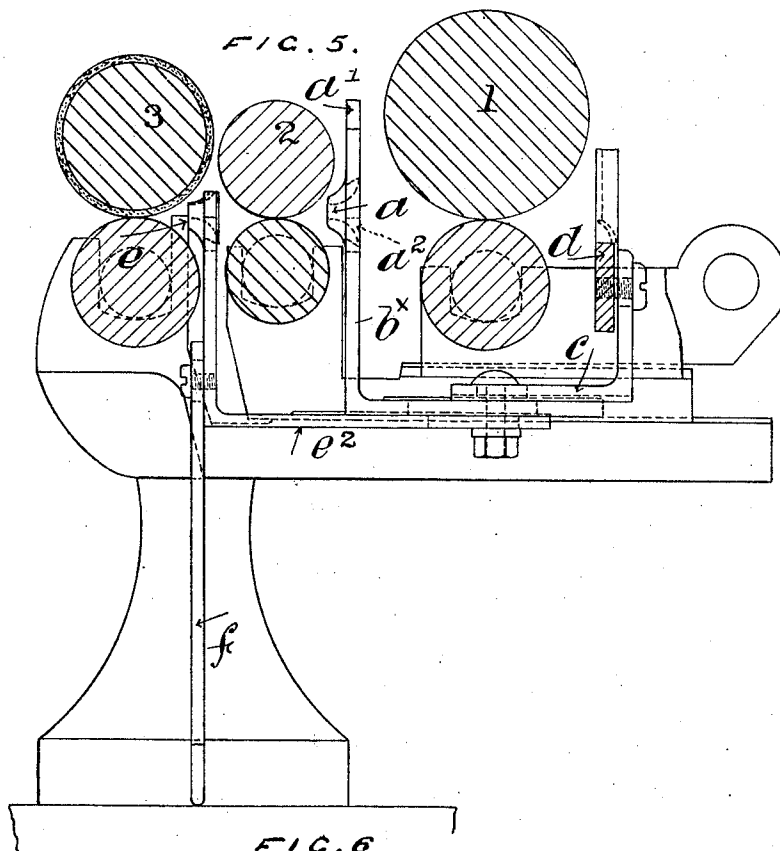
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6 Sheets-Sheet 2



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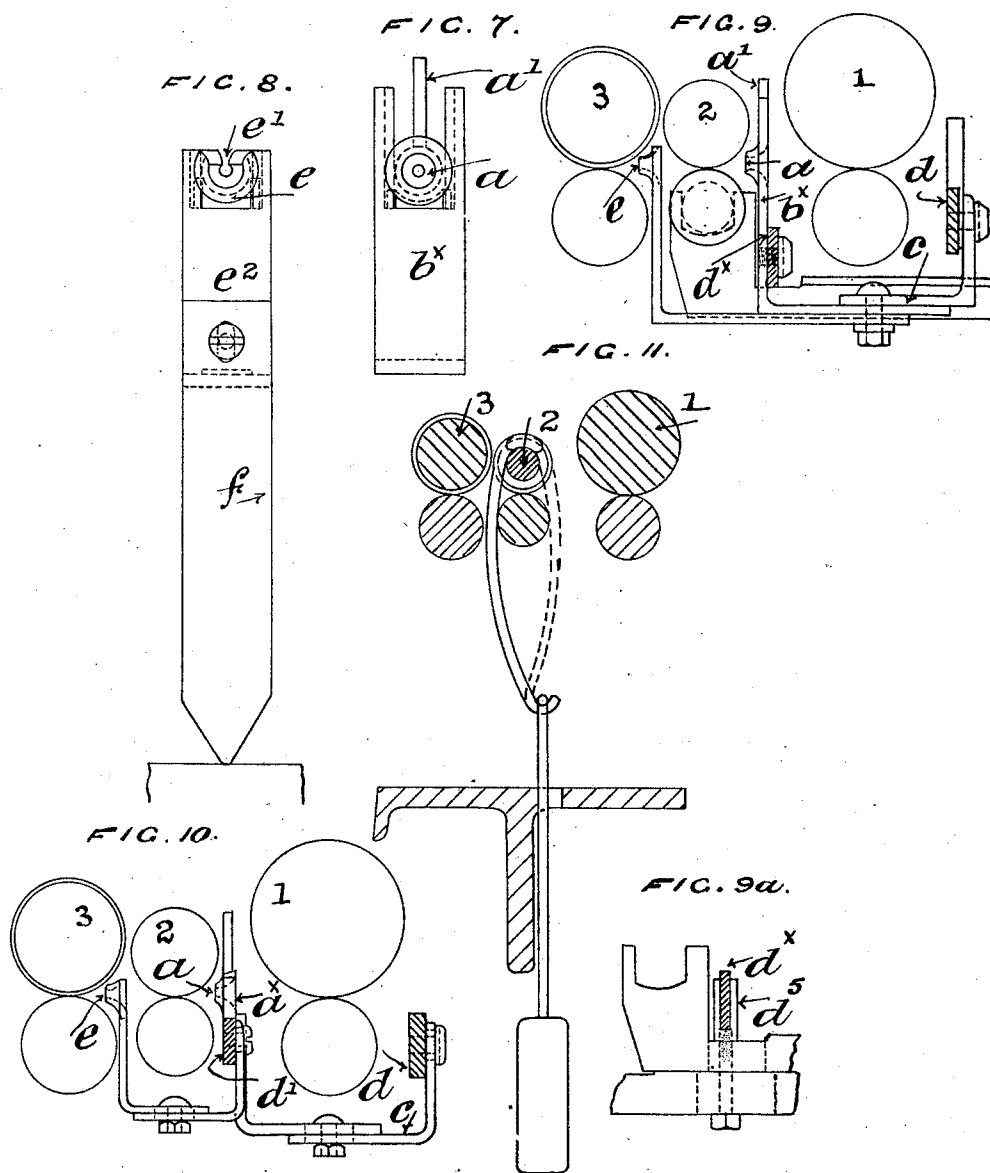
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HIGH DRAFT SPEED FRAME FOR DRAWING, TWISTING, AND WINDING TEXTILE MATERIALS

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6 Sheets-Sheet 3



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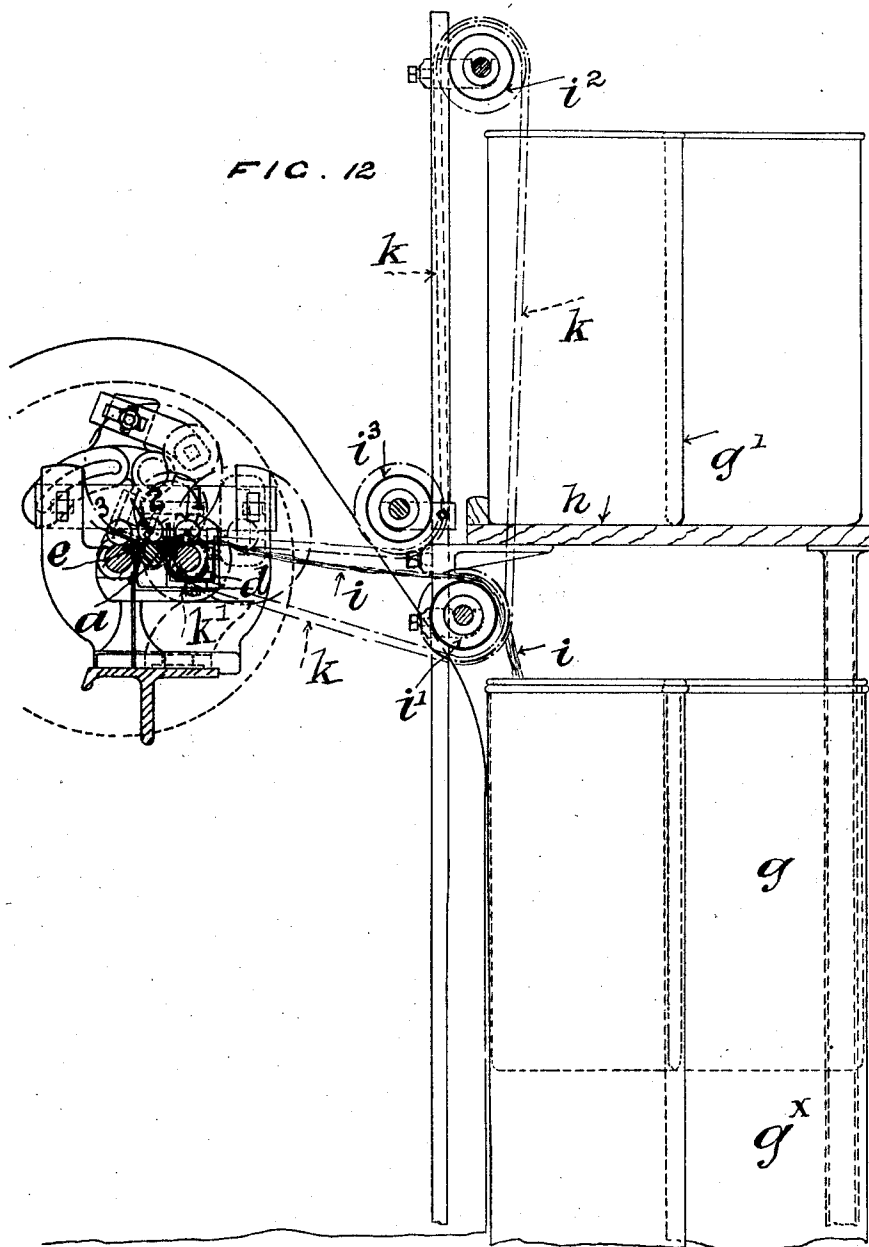
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6 Sheets-Sheet 4



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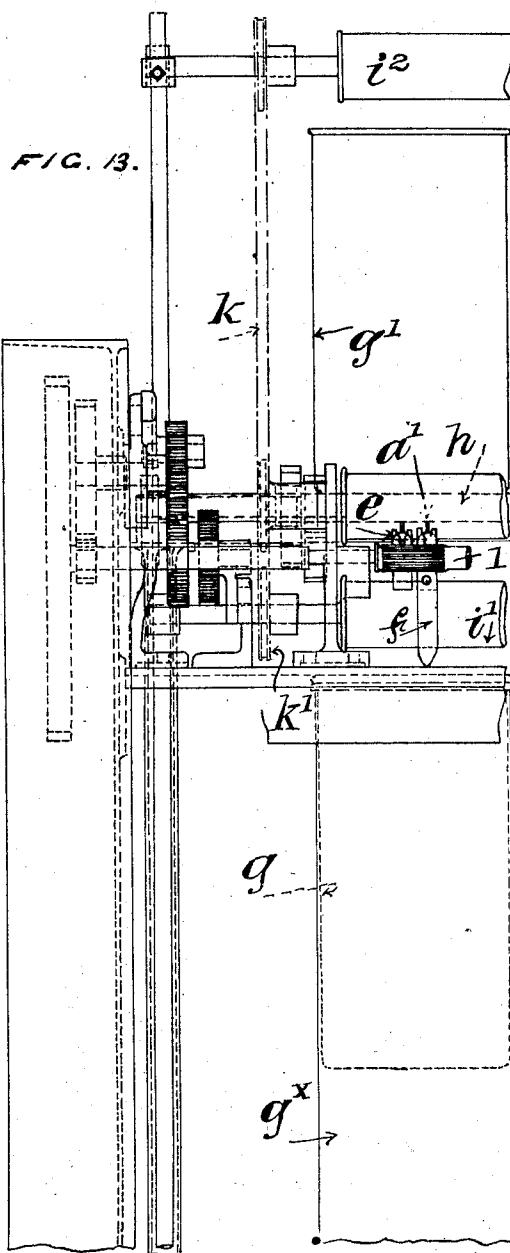
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HIGH DRAFT SPEED FRAME FOR DRAWING, TWISTING, AND WINDING TEXTILE MATERIALS

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6 Sheets-Sheet 5



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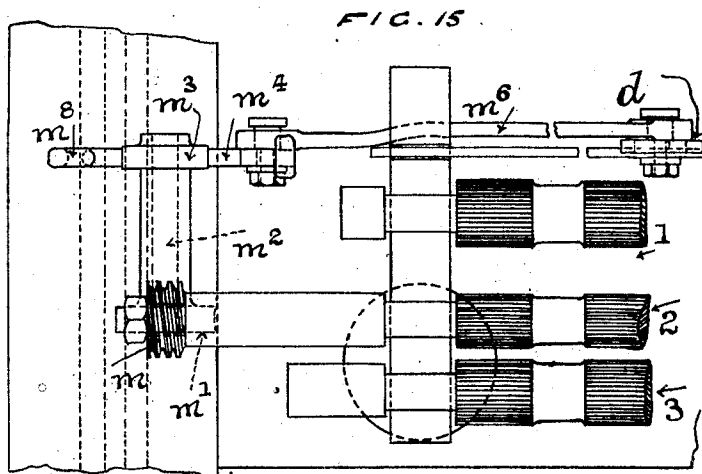
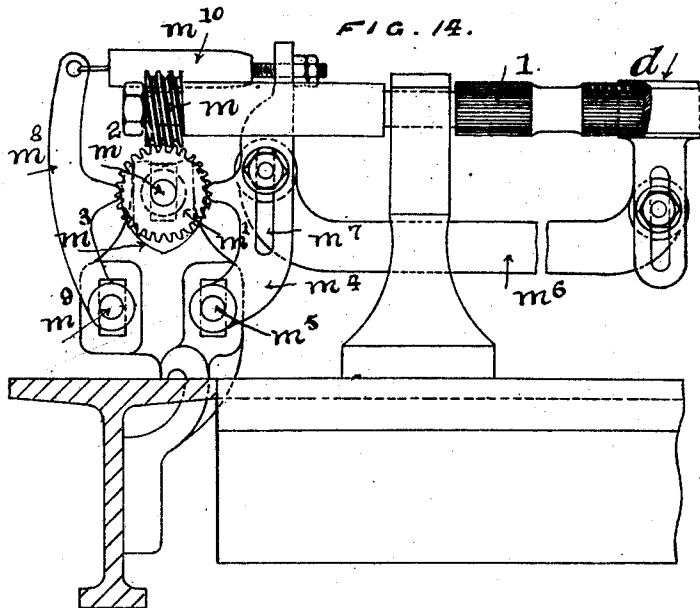
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HIGH DRAFT SPEED FRAME FOR DRAWING, TWISTING, AND WINDING TEXTILE MATERIALS

Filed Nov. 30. 1926

6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE.

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HIGH-DRAFT SPEED FRAME FOR DRAWING, TWISTING, AND WINDING TEXTILE MATERIALS.

Application filed November 30, 1926, Serial No. 151,623, and in Great Britain December 19, 1925.

The improvements forming the subject-matter of this invention are concerned with high draft speed frames for drawing, twisting and winding cotton or textile material, that is, the group of machines following the drawing frame and up to and including the roving frame or it may be even the ring frame or mule.

The purpose of the slubbing, intermediate, and roving frames is to gradually arrive at the desired fineness and to permit of the requisite drawing by the introduction at each frame of a certain amount of twist due to the flyers at each stage of the drafting of the roving delivered by the drawing rollers. In normal speed frames, the amount of "draft" is limited, because if this is high, serious licking occurs. If the draft is too high the material cannot be got through the rollers at all because the licking is so considerable.

My invention contemplates the automatic consolidation by a mechanical device of the passing sliver in connection with the draw rollers of high draft frames of the class indicated. This consolidation enables a high draft to be effected without licking although the material has no twist, real or false, until after it is delivered at the front rollers. The device used, is in the nature of a small stationary or non-rotary trumpet or a hollow truncated cone and one of such is applied for each sliver and is mounted on a support and lies between the back line of drawing rollers and the middle-line where there is adequate space for its support. The manner of supporting the small trumpets may vary, the same being detachably secured either to provide spaced brackets carried directly or indirectly from the traverse bar, or the brackets which support the trumpets may be additionally supported by a provided slidable or guided traverse bar parallel with the usual traverse, or such small trumpets may be applied to an auxiliary traverse bar which in such a case may serve for the mounting of the small trumpets.

My invention also concerns an adjunct to

the small trumpet or truncated cone device which takes the form of a selvage guide having an upwardly open eye or eye of other type and which is located between the front and second line of drawing rollers and works in combination with the small trumpet device arranged as indicated. This selvage guide eye may be detachable but in any case it forms part of a bracket which is applied to the support for the small trumpet device.

I arrange to closely pitch the sliver cans and I impart a short and more rapid traverse to the traverse bar all as will be later explained.

Other features of construction will be explained in detail in the following description.

The attached drawings sufficiently illustrate the invention and will be referred to in the description which follows.

In the said drawings:—

Fig. 1 is an elevation showing the general idea, that is, a detachable trumpet shaped device which prevents "licking", and a selvage guide which also prevents "licking", each group supported from the traverse bar.

Fig. 2 shows separated the elements of the detachable trumpet shaped device.

Fig. 3 shows separated the elements of the selvage guide and a bracket.

Fig. 4 is a diagram showing that the applied devices are set to elevate the fibres above the lines of contact of the rollers and prevent them floating.

Fig. 5 is a view similar to Fig. 1 but indicating slight modifications.

Fig. 6 shows a plan view of Fig. 5.

Fig. 7 is a front elevation of the detachable trumpet and its supporting bracket.

Fig. 8 is a view of the selvage guide, its bracket and a front support all seen in Fig. 5.

Fig. 9 illustrates the provision of a weight carrying auxiliary traverse bar which lends support to the brackets carrying the trumpets and is parallel with the usual traverse bar.

Fig. 9^a indicates a similar idea, but the auxiliary traverse bar, in this case, slides in provided guide brackets.

Fig. 10 shows a further modification with the detachable trumpet and the selvage guides supported from an additional traverse bar interconnected with the usual traverse bar.

Fig. 11 indicates ways of weighting the middle line of rollers.

Figs. 12 and 13 are general arrangement views which also indicate how the sliver cans may be creeled for close pitching.

Figs. 14 and 15 indicate how the speed of the traverse bar or part can be quickened as is found desirable.

Referring in the first place more particularly to Figs. 1 to 4 I there show three lines of drawing rollers marked 1, 2, 3 and all such rollers may be plain or leather covered and may be self, saddle or dead weighted or otherwise weighted. For very high drafts up to 75 it has been advantageous on the roving frame to have the middle top roller leather covered and dead weighted as indicated at Fig. 11. Roller gearing arrangements using a system of double carriers are required to secure very high drafts and this is indicated at Figs. 12 and 13.

In Fig. 1 the small trumpet or hollow truncated cone is marked *a*, and it is shown separately at Fig. 2. It has a handle *a'* and lower bevelled or grooved sides *a''* to fit the bevelled prongs *b'* of the lever element *b''* which is fulcrumed at *b'''* to the base element *b* of the complete bracket. This complete bracket *b* is fixed to a small cranked bracket *c* applied to the traverse bar *d* whereby each trumpet *a* partakes of the motion of the traverse bar. The lever element *b''* is held by a plate spring *b'''* which, acting on the element *b''*, presses the trumpet *a* closely into the nip of the middle line of rollers 2. Located in the nip of the front line of rollers 3 is the selvage guide separately shown in Fig. 3. This is illustrated as an open-eyed detachable guide *e* with bevelled sides *e'* fitting a bevelled edge slot in the bracket *e''* which is secured to the bracket *b*, as Fig. 1 shows.

The attachable and detachable trumpet *a* and the selvage guide *e* are so set that the lower operative contact face elevates the fibres, thus producing sufficient drag on fibres which are not gripped by either nip to prevent them being floated forward, until the ideal time for drafting, and this is indicated in diagrammatic form in Fig. 4. This enables me to make use of normal roller stands.

In Figs. 5 to 8 a slightly different structure is illustrated. In this case, the detachable trumpet *a* (see also Fig. 7) is carried in a right-angle bracket *b** which is bolted to a bracket *c* secured to a traverse bar *d* and

the selvage guide *e* (see also Fig. 8) is detachably carried in a bracket *e''*. To the bracket *e''* a crutch or prop *f* is fixed, and its rounded lower extremity slides on the roller beam (see Fig. 5) a number of such spaced crutches or props *f* being used.

In Fig. 9 I show an auxiliary traverse bar *d** to which the bracket elements *b** can be attached. This auxiliary guide is parallel with the traverse bar *d* and slides on the upper face of the roller stand. It serves as a guide and obviates the use of pendent props. The Fig. 9^a indicates a slight modification in that the auxiliary guide bar *d** is guided in provided brackets *d''* and these brackets may be adjustable.

A modified way of supporting the attachable and detachable trumpet *a* and the selvage guide *e* is indicated at Fig. 10 where an auxiliary traverse bar *d'* is located and guided between the back and middle line of rollers and this auxiliary traverse bar is furnished with upwardly projecting arms *a** bevelled or grooved on the inner opposing faces of the upright arms to receive the spaced attachable and detachable trumpets *a*. The auxiliary traverse bar *d'* is interconnected with the main traverse bar *d* by brackets. Also the selvage guides *e* are supported by brackets from the auxiliary traverse bar *d'* in some such fashion as indicated at Fig. 10. These modified methods of supporting the attachable and detachable trumpets *a* and selvage guides *e* produce a well-balanced arrangement and one which is simple in construction and does not require the use of pendent props as before related.

The positioning of the attachable and detachable trumpets and the selvage guides is very important. They should be set-up as close to the middle and front roller nips as is possible and, where exceptional close fitting is needed, the arrangement according to Figs. 1 to 3 is very good, because the spring *b*, whilst pressing the trumpet close to the nip yet allows the element *b''* to be pushed back to remove the trumpet without interference from the top middle roller.

To help in alignment, the selvage guide *e* should be so constructed and held that it fits its vertical support as truly as does the trumpet *a* whilst at the same time it is removable. This is important because the alterations of size of the orifice or passage way varies slightly according to the fineness of the hank, roving or yarn being spun.

Over a wide range of hank, roving or count of yarn the trumpet guide *a* is universal, the orifice being say about $\frac{1}{8}$ " diameter at the point nearest the roller nip, whilst the selvage guide *e* may be varied $\frac{1}{2}$ of an inch or more or less according to the fineness or coarseness of the hank. Guides so set are effective in securing high

drafts with all cottons using the existing types of rollers, roller stands, clearers, and weighting on all standard speed frames.

The trumpet guide *a* is essentially a condensing guide which smooths out all fluffiness of the sliver and condenses the cotton which is all that is required before feeding it to the middle roller nip. The selvage guide *c* is essentially a selvage guide rather than a condensing device. The two guides *a* and *c* enable very high drafts to be secured without licking.

The setting of the guides *a* and *c* is of the greatest importance, and they should be arranged, as shown in the figures, so that the material rests or is held at the bottom of each aperture, this being of particular importance in the case of the front guide as thereby I am enabled to use a slotted front guide which is a considerable help in piecing-up and without risk of making any extra fly, while the elevation also tends to prevent floating fibres.

As regards creeling of the sliver I use the arrangement indicated by Figs. 12 and 13, using small cans such as *g*, *g'*. A full can of say 8 lbs. sliver will, using high drafts and at normal flyer speed, last a considerable time and therefore owing to possible deterioration through the sliver standing too long I prefer to use shallow cans *g*, *g'* instead of standard cans.

The shallow cans *g* are fitted into the ordinary large cans *g''* which stand on the floor whilst the small cans *g'* rest on a table or ledge *h*, the top cans being of such a height and so located as to be convenient for the operative. In this way it is possible to so closely pitch the cans as to get sufficient ends to feed all the flyers in the frame.

The slivers *i* from the bottom cans *g* pass over brass rollers *i'* and are fed through the usual U shaped guide into the nip of the back line of rollers 1. The slivers (not shown) from the top cans *g'* pass over similar brass rollers *i''*, then vertically down and underneath a third line of brass rollers *i'''* and are likewise fed to the back roller nip. The sets of three brass rollers *i'*, *i''*, *i'''*, are positively driven by an endless chain *k* from a sprocket wheel *k'* on the back line of rollers 1. These rollers may be grooved or corrugated to prevent adjacent slivers running together.

Accurate setting and actuation of the traverse bar (such as *d*) is essential. With the ordinary gearing, the traverse is too slow for high drafts, consequently I modify the ordinary system of driving, using an arrangement on the lines indicated in Figs. 14 and 15. In this arrangement a double worm *m* is fixed on the middle roller axle 2 and this drives a worm wheel *m'* on the shaft *m''* this shaft *m''* carrying a heart cam *m'''* which acts on a lever *m''''* pivoted at *m'''''*. A connec-

tion is made by a link *m''''''* to the traverse bar *d* whereby motion imparted to the lever *m''''* by the heart cam *m'''* is conveyed to the traverse bar *d*. Lever *m''''* is slotted at *m''''''* so that the motion conveyed from the heart cam *m'''* can be regulated. The lever *m''''* fulcrumed at *m''''''* is the opposing lever to *m''''* the two being interconnected by a spring *m''''''''*. Such an arrangement gives a short and more rapid traverse to the bar *d*.

I declare that what I claim is:—

1. The combination with a high draft speed frame having three pairs of drawing rollers and a traverse bar, of a supporting member carried by said traverse bar and extending between the rear and intermediate pairs of rollers, a supporting member carried by the traverse bar and extending between the intermediate and front pairs of rollers, a closed trumpet-shaped condensing guide carried by said first supporting member and instantly detachable therefrom, and an open-eyed selvage guide carried by said second supporting member and instantly detachable therefrom.

2. The combination with a high draft speed frame having three pairs of drawing rollers and a traverse bar, of a supporting member carried by said traverse bar and extending between the rear and intermediate pairs of rollers, a supporting member carried by the traverse bar and extending between the intermediate and front pairs of rollers, a closed trumpet-shaped condensing guide carried by said first supporting member and instantly detachable therefrom, and an open-eyed selvage guide carried by said second supporting member and instantly detachable therefrom, the operative portions of both of said guides being disposed slightly above the line of contact of the upper and lower rollers of the respective pairs.

3. The combination with a high draft speed frame having three pairs of drawing rollers and a traverse bar, of a pair of interconnected supporting members carried by said bar, one extending between the rear and intermediate pairs of rollers and carrying a closed trumpet-shaped guide, and the other extending between the intermediate and front pairs of rollers and carrying an open-eyed selvage guide, the supporting member for the closed trumpet guide being resiliently maintained in operative position.

4. The combination with a high draft speed frame having three pairs of drawing rollers and a traverse bar, of a bracket secured to said traverse bar, a supporting member pivotally carried by said bracket and extending between the rear and intermediate pairs of rollers, resilient means for opposing swinging movement of the supporting member on its pivot toward the rear rollers and positive means for preventing

swinging movement toward the intermediate
rollers, a supporting member carried by the
bracket and extending between the interme-
diate and front pairs of rollers, a closed
5 trumpet-shaped condensing guide carried by
said pivoted supporting member and in-
stantly detachable therefrom, and an open-
eyed selvedge guide carried by said second
supporting member and instantly detachable
therefrom. 10

In testimony whereof I have signed my
name to this specification.

ARTHUR ERNEST OXLEY.