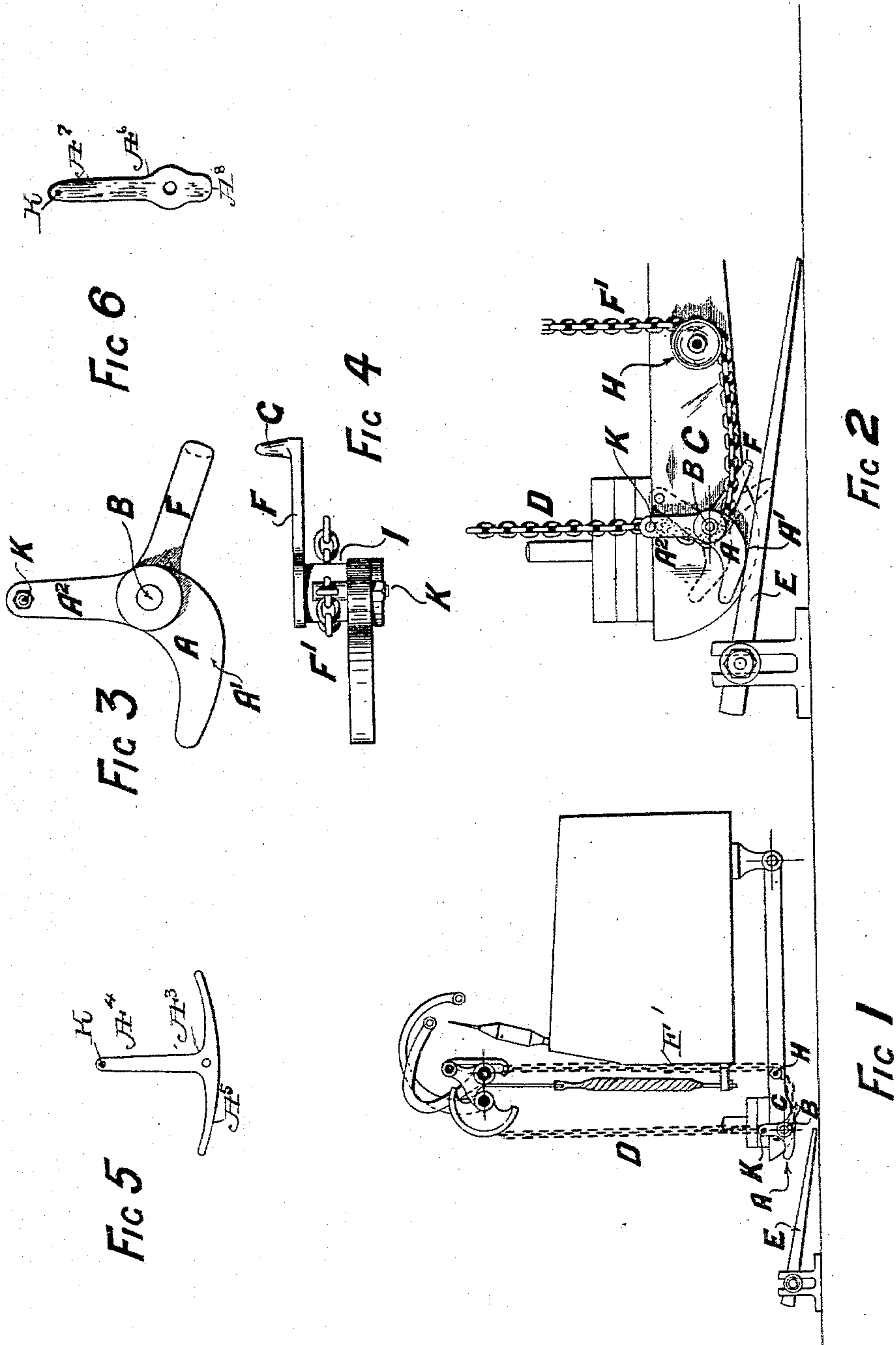


(No Model.)

J. MOORHOUSE.
SELF ACTING SPINNING MULE.

No. 514,330.

Patented Feb. 6, 1894.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOSEPH MOORHOUSE, OF SHAW, ENGLAND.

SELF-ACTING SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 514,330, dated February 6, 1894.

Application filed March 28, 1893. Serial No. 468,003. (No model.) Patented in England August 29, 1892, No 15,484.

To all whom it may concern:

Be it known that I, JOSEPH MOORHOUSE, a subject of the Queen of Great Britain, residing at Shaw, England, have invented certain new and useful Improvements in Self-Acting Spinning-Mules, (for which I have obtained a patent in Great Britain, No. 15,484, dated August 29, 1892,) of which the following is a full, clear, and exact specification.

My invention relates to mules for spinning cotton and other fibrous substances and refers to improved means for gradually relieving the counter faller shaft of the weight of the counter faller lever or "salmon-head" during the backing off motion and gradually applying said weight at the commencement of the winding on of the yarn.

In carrying out my invention I employ a "bell-crank" lever pivoted at the junction of its arms on a stud or bolt on the side of the ordinary "salmon-head" lever. One of the arms of this "bell-crank" lever assumes a vertical position and is connected to the ordinary chain for operating the counter faller and the other arm assumes more or less a horizontal position and is of a curved formation. This curved arm of said lever is designed to come against and rest upon a stationary incline and serve the purpose of gradually relieving and applying the weight of the "salmon-head" in the manner hereinafter described. As the mule carriage reaches the end of its outward traverse the curved arm of the crank lever comes upon the incline aforesaid. The "backing-off" now takes place causing the "salmon-head" lever to be lowered, the weight of which is now received by the point of the curved arm of the "bell-crank" lever and the said arm owing to its curved formation rolls or slides upon the incline until the point of rest is more or less beneath the supporting bolt thus gradually taking up the weight of the "salmon-head" and relieving the counter faller as desired. In order to apply the weight of the "salmon-head" at the instant of winding on the yarn the "bell-crank" lever as the carriage moves away slides off the incline, the curved arm gradually taking up the weight applies it to the counter faller. In practice I have found that the "incline" aforesaid if set too high either intentionally or by accident the "bell-

crank" lever being forced too far over causes a pull on the counter faller chain and brings on an inconvenient rising of the counter-faller wire. To obviate this I form the "bell-crank" lever with an additional arm and projecting stud, the said stud being designed to lie under the "salmon-head" lever, and I continue the chain from the coping faller round a pulley or roller on the "salmon-head" lever and around the boss of the "bell-crank" lever whence it is connected or joined to the faller shaft chain. A bolt is passed through the chain to attach it to the vertical arm of the "bell-crank" lever. The effect of this combination is that any undue elevation of the incline lever simply causes the "salmon-head" to be lifted bodily instead of a very inconvenient pull coming on to the counter faller chain. As soon as the "salmon-head" lever is released by the lowering of the counter faller chain the bell crank lever comes to rest on the incline and the action of the "bell-crank" lever in taking up the counter faller chain is substantially the same as above described.

On the accompanying drawings Figure 1 is an end elevation of a mule carriage with my improvements shown applied thereto. Fig. 2 is an enlarged detail view. Figs. 3 and 4 are still larger views of the "bell-crank" lever, being side and plan views respectively. Figs. 5 and 6 are modifications of the lever.

In accordance with my invention A is the "bell-crank" lever mounted upon a stud or bolt B on the side of the ordinary "salmon-head" lever C. The normal position of the lever is shown in Fig. 1 and as the mule carriage reaches the end of its outward traverse the point of the horizontal arm comes in touching contact with or rests upon the incline E. As soon as the "salmon-head" weight is to be relieved it will be evident that the lowering of the "salmon-head" will cause the lever A to receive the weight thereof and in so doing such lever owing to its curved edge A' rolls or slides upon the incline E and gradually takes up the weight and assumes the position shown in dotted line in Fig. 2, when the weight is really carried by the bolt B and the slack of the chain D is more or less absorbed or taken up by the peculiar angle assumed by the arm A'. On the carriage com-

men-
 5 cing to draw in or wind on the yarn the
 rolling or sliding action of the lever is re-
 versed commencing from the point of rest to
 the tip of the lever and thus causing the
 weight to be gradually applied again without
 any shock or strain on the yarn.

In the drawings I have shown an additional
 arm F with stud G taking under the "salmon-
 head" lever (see Fig. 2) and the coping
 10 faller chain F' continued around a roller or
 pulley H on the "salmon-head" lever and
 around the boss I (see Fig. 4) of the "bell-
 crank" lever whence it is connected or joined
 to the counter faller chain D which is con-
 15 nected by a bolt K or its equivalent to the
 upright arm of the lever A. This arrange-
 ment insures that if the incline E should be
 unduly elevated the "salmon-head" is caused
 to be lifted bodily instead of a very inconven-
 20 ient pull coming on to the faller chain. As
 soon as the "salmon-head" is released by the
 lowering of the counter faller chain the
 "bell-crank" lever A comes to rest on the in-
 incline E and the action of taking up the chain
 25 is effected by the rolling action of the curved
 arm of the lever A.

Instead of the bell-crank lever A, I may em-
 ploy a triple armed or anchor lever A³, (Fig.
 5,) comprising the upright arm A⁴ having the
 30 curved lower surface A⁵ and carrying the bolt
 K; or I may employ the lever A⁶, (Fig. 6,)

composed of the upright arm A⁷ having the
 curved lower end A⁸ and carrying the bolt K.

Having thus particularly described and as-
 35 certain the nature of my said invention and
 in what manner the same is to be performed,
 I declare that what I claim, and desire to se-
 cure by Letters Patent, is—

1. In a self-acting mule, the combination
 with an incline E, of a salmon-head lever C, 40
 the two-armed lever A pivoted to the salmon-
 head lever and having one arm adapted to bear
 against the incline, and the counter faller and
 coping chains D and F' in operative connec-
 tion with the other arm of the lever which is 45
 pivoted to the salmon-head lever, substan-
 tially as described.

2. In a self-acting mule, the combination
 with an incline E, of a bell-crank lever A hav-
 ing the projecting arm F, a salmon-head le- 50
 ver C to which the bell-crank lever is pivot-
 ally attached, the counter faller chain D con-
 nected to one arm of the bell-crank lever,
 and the coping chain F' connected with
 the counter faller chain, substantially as de- 55
 scribed.

In testimony whereof I affix my signature to
 the foregoing specification.

JOSEPH MOORHOUSE.

Witnesses:

WALTER GUNN,

EDWIN SETTLE.