

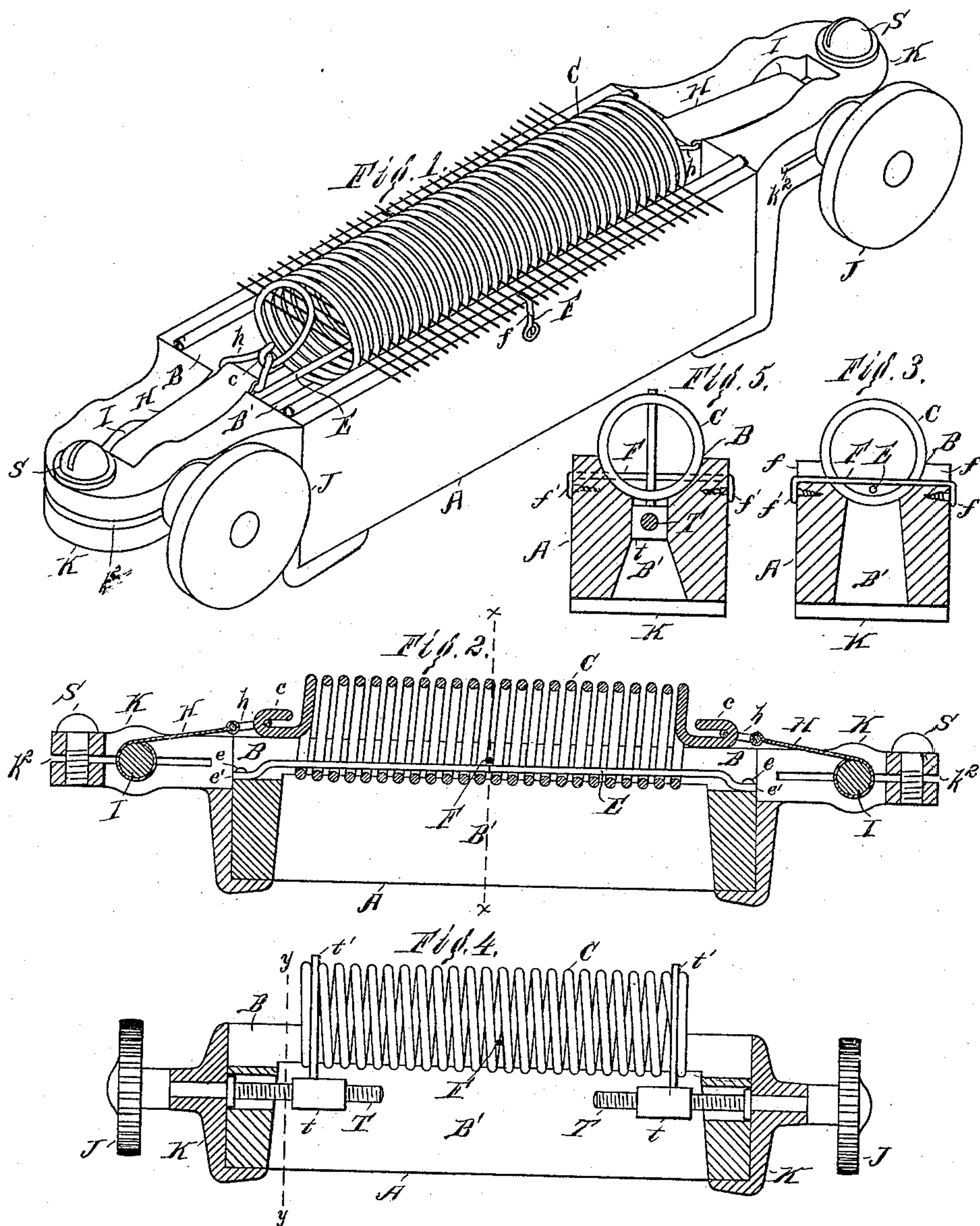
(No Model.)

T. C. ENTWISTLE.

EXPANSION COMB FOR WARPING, BEAMING, AND OTHER MACHINES.

No. 343,801.

Patented June 15, 1886.



Witnesses—
Kirkley Hyde,
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Inventor—
Thomas C. Entwistle,
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UNITED STATES PATENT OFFICE.

THOMAS C. ENTWISTLE, OF LOWELL, MASSACHUSETTS.

EXPANSION-COMB FOR WARPING, BEAMING, AND OTHER MACHINES.

SPECIFICATION forming part of Letters Patent No. 343,801, dated June 15, 1886.

Application filed February 1, 1886. Serial No. 190,468. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. ENTWISTLE, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Expansion-Combs for Warping, Beaming, and other Machines, of which the following is a specification.

My invention relates to expansion-combs for warping, beaming, and other machines; and the object of said improvement is to simplify the expansion-comb now used, to reduce the number of its parts, and to provide means of allowing the dirt and lint which ordinarily accumulates in a comb-box to escape therefrom.

In the accompanying drawings, Figure 1 is an isometric view of my improved expansion-comb; Fig. 2, a central vertical longitudinal section of the same; Fig. 3, a vertical cross-section of the same on the line $x x$ in Fig. 2; Fig. 4, a central vertical longitudinal section through the comb-box and brackets of a modified form of the same, the modification relating to the means by which the comb is expanded, and the other parts being shown in elevation; Fig. 5, a vertical cross-section on the line $y y$ in Fig. 4.

The comb hereinafter described is supported on the frame of the warping or beaming machine in any usual manner, and is adapted to be used with any warping or beaming machine in which an expansion-comb is used.

The ordinary expansion-comb consists of a series of dents arranged vertically between the coils of one or two pairs of springs, and projecting upward through a longitudinal slot in the upper part of the comb-box within which such springs and the lower parts of such dents are inclosed, and guide-rods which extend within said springs from end to end of the same on opposite sides of said dents to hold said springs and dents in their proper positions relative to each other, and a stop-rod which extends from end to end of the box through holes in the lower part of said dents to prevent said dents being drawn out of said springs and comb-box. These guide-rods and the stop-rod frequently interfere with the expansion and contraction of the springs in cer-

tain parts thereof, and sometimes cause a permanent set or extension in the springs at some point, thus making the springs useless. The comb-box as usually constructed is liable to become filled with lint and flyings to such an extent as to interfere with the operation of the comb by preventing an equal expansion or contraction of the springs throughout their length, thereby preventing the equal spacing of the dents.

The "comb box" A, if such it can be called, used by me consists of a bar of wood or metal grooved or hollowed out at B on its upper surface nearly from end to end thereof, and slotted entirely through at B' from the bottom of said groove B to the bottom of said bar, and almost from end to end of said groove. A spiral spring, C, is laid in said groove and projects therefrom for more than half of its diameter. The spring C is prevented from rising out of the groove by a rod, E, which runs through said spring just out of contact therewith at the bottom of the same, and is secured at its ends by screws $e e$ which pass through eyes e' in the ends of said rod. The ends of the spring are bent into hooks $c c$, which engage loops $h h$, secured to the ends of metallic ribbons H H, one at each end of the box, which ribbons are wound upon drums I I, supported horizontally in heads or brackets K K, secured to the ends of said bar or comb-box and turned by means of hand-wheels J J, secured to said drums, said drums being prevented from being accidentally turned by the friction thereon of said brackets, which are provided with horizontal slits $k^2 k^2$, and with screws S S, which turn in said brackets vertically to contract said slits and to close the parts of said brackets above and below said slits upon said drums. The brackets are secured to the ends of the box or bar by screws.

The devices above named for expanding the spring are substantially shown and described in Patent No. 333,399.

It will be seen that the coils of the springs being exposed above the top of the bar or box serve as dents, the spaces between said coils receiving the warp-yarns just as the interdental spaces of an ordinary expansion-comb receive said yarns. The middle of the spring is prevented from moving longitudinally by a

wire, F, laid in notches *f* across said bar A in the space between two coils of said spring, said wire being turned down over the sides of said bar, and the ends of said wire being provided with eyes *f' f'*, into which screws are driven which enter the bar A.

In Figs. 4 and 5 another means of expanding the spring is shown, which consists of screws T T, one at each end of the comb-box, provided with hand-wheels and turning in brackets K K, secured to the end of said box, said screws T T reaching through said brackets and into the slot B. On said screws within said slot turn nuts *t t*, from which project vertical studs *t' t'*, which engage with the end coils of the spring C.

The means of expanding the spring shown in Fig. 4, as well as the means shown in Figs. 1 and 2, permit of expanding the spring from either end independently of the other end.

It is evidently impossible for lint and flyings to accumulate on the bar A and between the coils of the spring to such an extent as to interfere with the expansion and contraction of said spring, because such lint and flyings will drop through the slot B'.

I claim as my invention—

1. The combination of a straight bar slotted through vertically nearly from end to end and provided in its upper surface with a longitudinal rounded groove opening into said vertical slot, a spring laid in said groove, a rod placed within said spring and extending through the same and having its ends secured to said bar

within said groove beyond the ends of said slot, brackets secured to the ends of said bar provided with horizontal slits, drums turning in said brackets, screws turning in said brackets to contract said slits to hold said drums from turning, ribbons or straps secured to said drums and to the ends of said spring, and means, substantially as described, of preventing the movement of the middle of said spring, as and for the purpose specified.

2. The combination of a straight bar slotted through vertically nearly from end to end and provided in its upper surface with a longitudinal rounded groove opening into said vertical slot, a spring laid in said groove, a rod placed within said spring and extending through the same and having its ends secured to said bar within said groove beyond the ends of said slot, brackets secured to the ends of said bar provided with horizontal slits, drums turning in said brackets, screws turning in said brackets to contract said slits to hold said drums from turning, ribbons or straps secured to said drums and to the ends of said spring, and a wire or rod placed between the middle coils of said spring and secured to said bar, as and for the purpose specified.

In witness whereof I have hereunto subscribed my name this 27th day of January, A. D. 1886.

THOMAS C. ENTWISTLE.

Witnesses:

ALBERT M. MOORE,
GERTRUDE M. DAY.