No. 772,582. PATENTED OCT. 18, 1904.

A. E. RHOADES.

METAL WARPER COMB.

APPLICATION FILED JUNE 4, 1904.

NO MODEL.

Fig: 1.

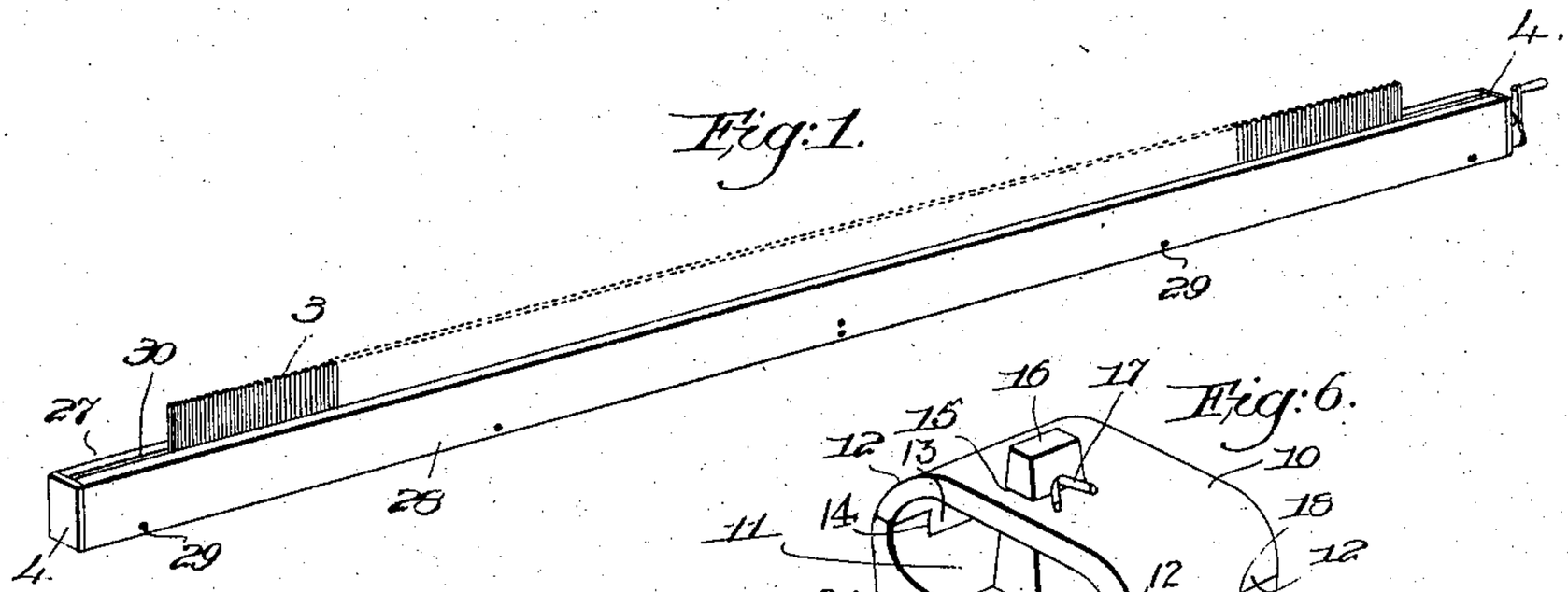


Fig: 6.

Fig: 2.

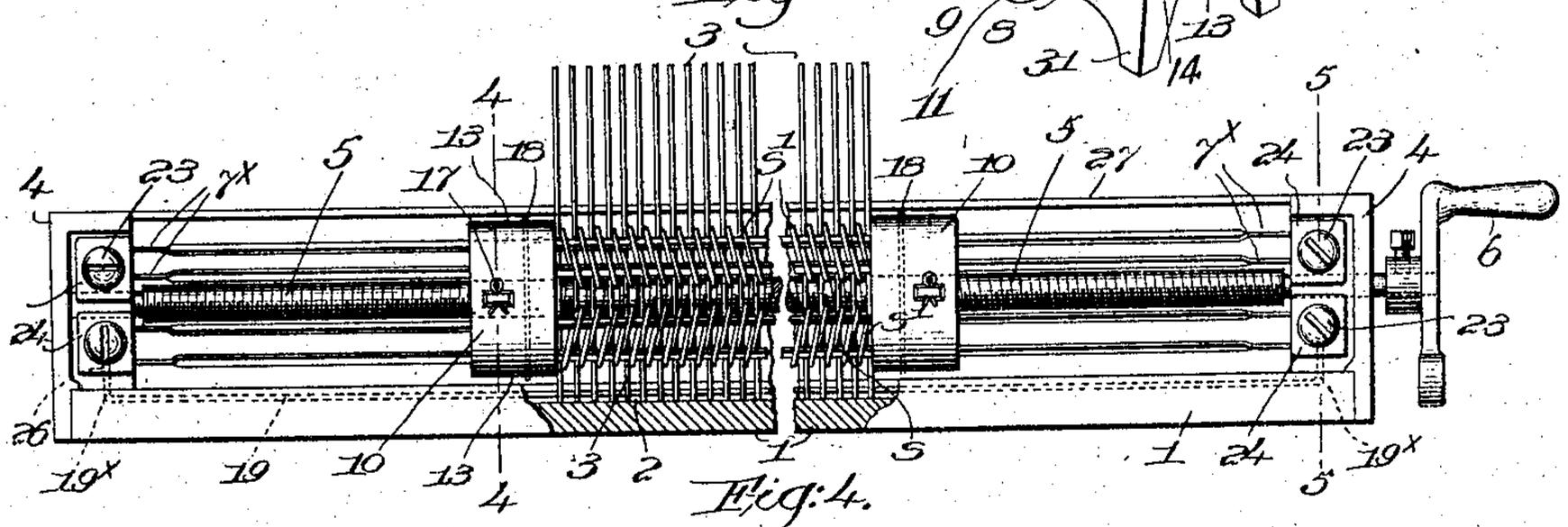


Fig: 4.

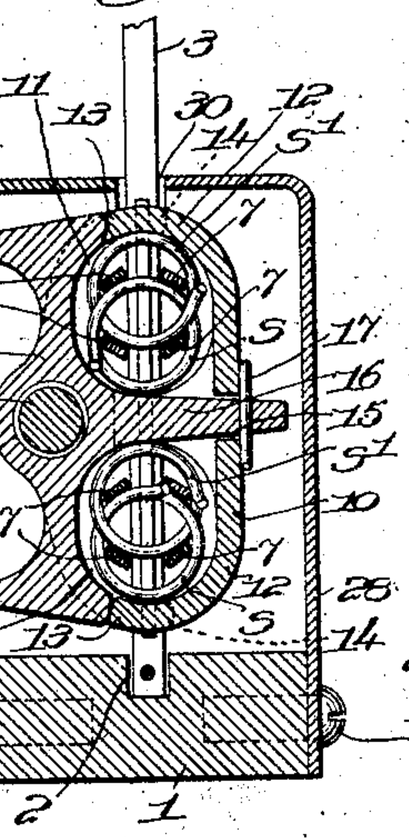


Fig: 3.

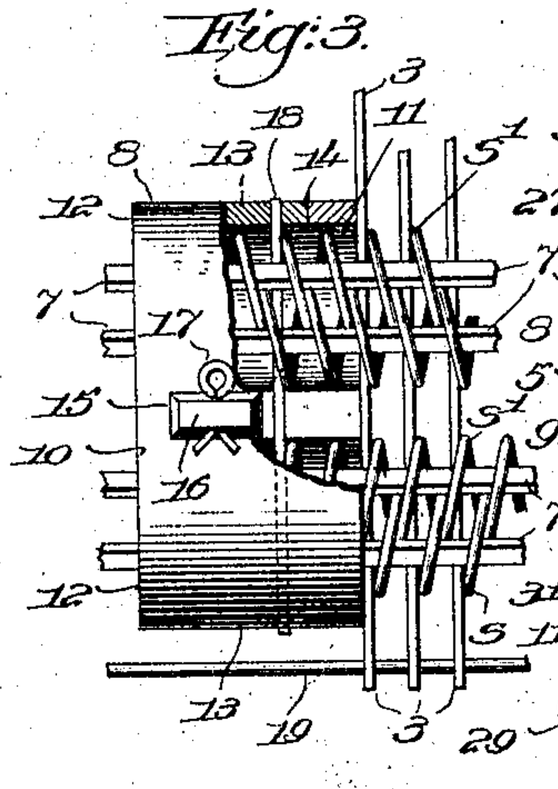
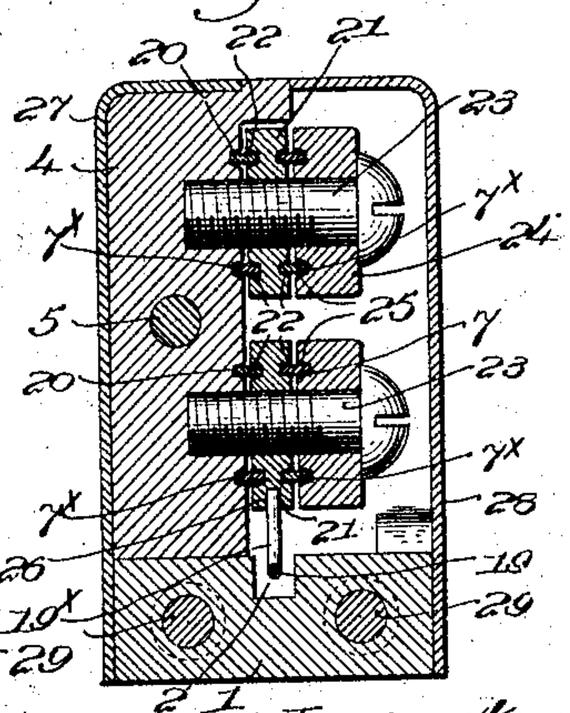


Fig: 5.



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No. 772,582. Patented October 18, 1904.

UNITED STATES PATENT OFFICE.

ALONZO E. RHOADES, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

METAL WARPER-COMB.

SPECIFICATION forming part of Letters Patent No. 772,582, dated October 18, 1904.

Application filed June 4, 1904. Serial No. 211,084. (No model.)

To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Metal Warper-Combs, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to warper-combs used on warpers to separate the threads leading to the beam; and it has for its object the production of a warper-comb embodying various novel features of construction and arrangement, which will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a perspective view of a warper-comb embodying my invention. Fig. 2 is an enlarged front elevation thereof centrally broken out and with the front of the casing removed, a portion of the base or stand being shown in section. Fig. 3 is an enlarged detail, in front elevation, of one of the longitudinally-movable sleeves to which the springs are attached, the cap of the sleeve being broken out. Fig. 4 is a transverse section, also enlarged, on the line 4 4, Fig. 2, looking toward the right. Fig. 5 is a similar view on the line 5 5, Fig. 2, also looking toward the right; and Fig. 6 is a perspective view of one of the sleeves with its cap in place.

The elongated metallic base or stand 1, having a longitudinal recess 2 in its upper face to receive the lower ends or feet of the upright warp-guides or dents 3, the end pieces 4, rigidly secured to the extremities of the stand 1, the rotatable right and left hand screw-threaded adjusting shaft or rod 5, mounted in the ends 4 and having an attached handle 6 at one end, (see Figs. 1 and 2,) the coiled springs *s s'*, arranged in pairs, one pair above the other pair and somewhat in front of the adjusting-rod 5, and the longitudinally-extended guides 7, extended through the springs, may be and are substantially of well-known construction.

Heretofore the sleeves or nut-like collars to which the springs are attached have been so constructed that the replacement of a set of wires and springs has been attended with considerable difficulty, and in my present invention I have devised a novel form of sleeve which greatly facilitates such replacement.

Referring to Figs. 2, 3, 4, and 6, the sleeve is shown as made in two parts—a body 8, which has a threaded hole 9 to engage with the thread of the rod 5, and a detachable cap 10. The front face of the body is shaped to present upper and lower longitudinal concave seats 11 to receive the pairs of springs, as clearly shown in Fig. 4, and the cap 10 has rounded ends 12 to fit over the front portions of the springs when inserted in the seats. Lugs 13 on the ends of the cap fit into corresponding recesses 14 on the body to prevent any twisting of the cap, the latter being provided with a hole 15 to receive a forward projection or post 16 on the body, a cotter-pin or similar fastening 17 holding the cap on the post and in operative position upon the body. (See Figs. 2, 3, 4, and 6.) An upright pin 18 is held securely in the lugs 13 of the cap, said pin passing between coils of the two pairs of springs to secure the same to the cap, so that when the latter is in place on the body of the sleeve the springs will be connected with the latter. As the two sleeves with which the ends of the springs are connected are alike, it will be necessary to explain the construction of only one in detail, and it will be manifest that rotation of the adjusting-rod in one or the other direction will serve to expand or contract the springs, to thereby enlarge or diminish the spaces between the upright dents 3 in usual manner. The feet of the dents are apertured in usual manner to receive a retaining-wire 19, as

usual; but the ends of this wire and the ends of the guides 7 are secured in position in a novel manner.

Referring to Fig. 5, wherein one of the end pieces 4 is shown in section, it will be seen that the face of the end piece is provided with four parallel grooves or notches 20, in which are seated the ends of the rearmost set of guides 7, said guides being made of flat narrow strips of metal, their ends being twisted at right angles at $7^{\times}$ to enter the notches. Two washer-like plates 21, notched on their inner and outer faces at 22, are held in place by clamping-screws 23, supported by the end piece 4, the notches on the inner faces of the plates being located opposite the notches 20 to coöperate therewith in clamping the rearmost set of guides 7 in place. The front set of guides are seated in the notches 22 in the front faces of plates 21 and are held in place by caps 24, notched at 25 on their inner faces, so that when the clamp-screws 23 are set up both sets of guides 7 will be securely clamped in position. The ends of the retaining-wire 19 are upturned at $19^{\times}$ to enter holes 26 in the lowermost plates 21. (See dotted lines, Fig. 5.) When it is desired to substitute a new set of dents—as, for instance, when finer or coarser dents are desired, or when the springs have become too much worn—the substitution is readily effected, as the clamp-screws 23 are loosened, releasing the guides 7, the retaining devices 17 are withdrawn from the posts 16, and the sleeve-caps 10 are removed, taking with them the springs, guides, and dents, the upturned ends $19^{\times}$ of the retaining-wire being released from the plates 21 by pushing them down. The sleeve-caps can then be detached from the springs and a new set of springs and dents attached, after which the parts are replaced and the various members returned to the stand. The retaining-wire is secured, the ends of the guides inserted in the clamping means therefor, and the sleeve-caps are secured to the sleeves 8. In order to protect the springs and the threaded rod from dust, lint, &c., a cover is provided, said cover being made of sheet metal in two parts 27 28, held in place on the stand 1 by suitable screws 29, the tops of the parts of the cover leaving a longitudinal clearance 30, through which the dents project.

Referring to Fig. 4, it will be seen that the main portion or body 8 of the sleeve is provided at its back with extensions 31, which rest upon the inner face of the rear half 27 of the cover and slide thereover when the sleeves are moved toward or from each other, the extensions 31 preventing any rotative movement of the sleeves upon the adjusting-rod 5 when the latter is turned.

All the parts of the structure herein shown and described are made of metal, so that no twisting or other distortion due to dampness or changes of temperature will affect the parts, and the life and durability of the device are materially increased, while its strength and rigidity are greatly enhanced.

Having fully described my invention and the various novel features of construction and arrangement therein contained, what I claim, and desire to secure by Letters Patent, is—

1. In a warper-comb, a series of upright warp-guides, coiled springs to sustain and laterally position the same, an adjusting-rod having right and left hand threads thereon, sleeves coöperating therewith and having seats for the springs, and a detachable cap for each sleeve and to which the adjacent ends of the springs are secured, whereby the springs may be removed by detachment of the caps.

2. In a warper-comb, a series of upright warp-guides, coiled springs to sustain and laterally position the same, an adjusting-rod having right and left hand threads thereon, sleeves coöperating therewith and having seats for the springs, a detachable cap for each sleeve, means to retain the cap on its sleeve, and a device to connect the adjacent ends of the springs with the cap.

3. In a warper-comb, a series of upright warp-guides, coiled springs to sustain and laterally position the same, an adjusting-rod having right and left hand threads thereon, sleeves coöperating therewith and having seats for the springs, each sleeve having opposite recesses and a projecting post, a cap for each sleeve, provided with an opening to receive the post and having extensions to enter the recesses in the sleeve, a retaining device to coöperate with the post and prevent removal of the cap, and means to connect the adjacent ends of the springs with the cap.

4. In a warper-comb, a series of upright warp-guides, coiled springs to sustain and laterally position the same, an adjusting-rod having right and left hand threads thereon, sleeves coöperating therewith and having seats for the springs, a detachable cap for each sleeve, means to connect the adjacent ends of the springs with the cap, longitudinal guides extended through the springs, and means to clamp the ends of the guides in operative position.

5. In a warper-comb, a series of upright warp-guides, longitudinally-extended coiled springs arranged in pairs and adapted to sustain and laterally position the warp-guides, a threaded, longitudinal adjusting-rod arranged between the pairs of springs, two sleeves coöperating with the rod and moved toward or from each other by rotation of said rod, a de-

tachable cap for each sleeve, means to secure the adjacent ends of the springs to each cap, longitudinal guides extended through the springs behind and in front of the warp-guides, and means to clamp the ends of the said longitudinal guides in position.

6. In a warper-comb, an elongated base or stand having upright end pieces secured thereto, longitudinal guides, clamping means for the ends of said guides mounted on the end pieces, upright warp-guides, and means to sustain and laterally position the same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALONZO E. RHOADES.

Witnesses:
GEORGE OTIS DRAPER,
ERNEST W. WOOD.