(No Model.)

W. H. REDDING.

DOUP HEDDLE FOR LENO WEAVING.

No. 571,795. Patented Nov. 24, 1896.

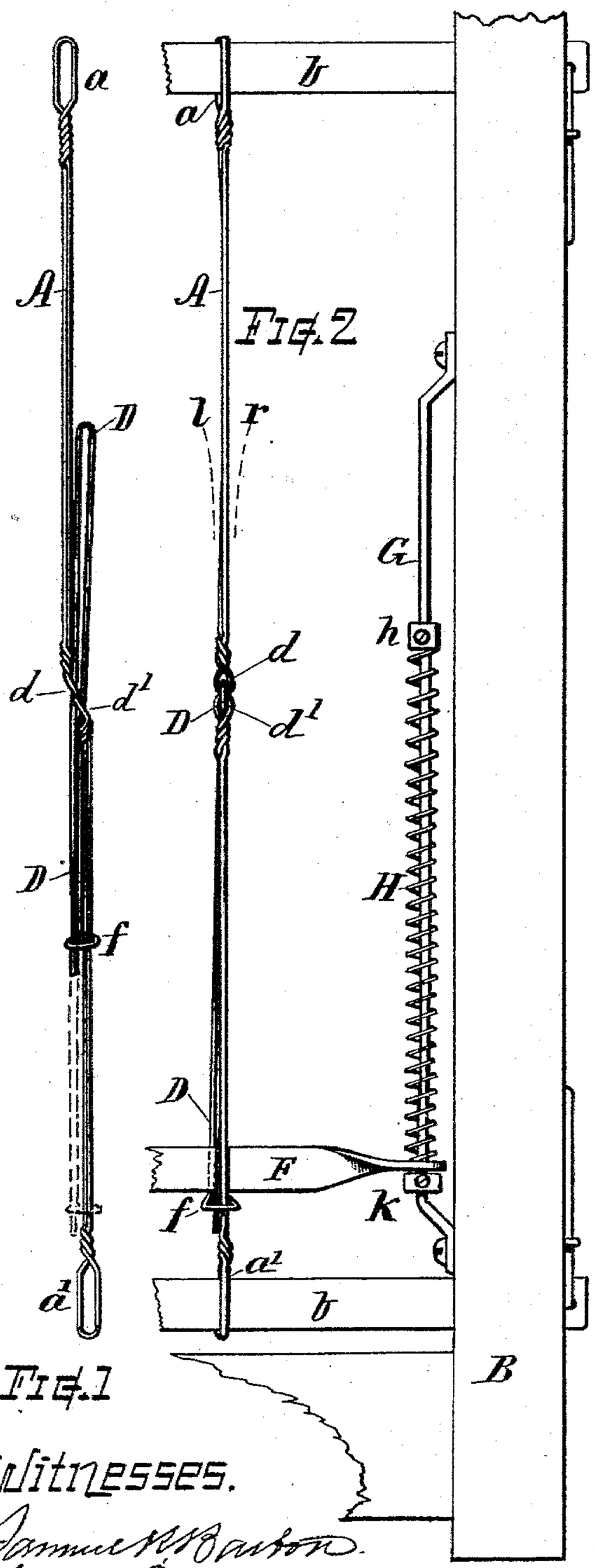

FIG. 1

FIG. 2

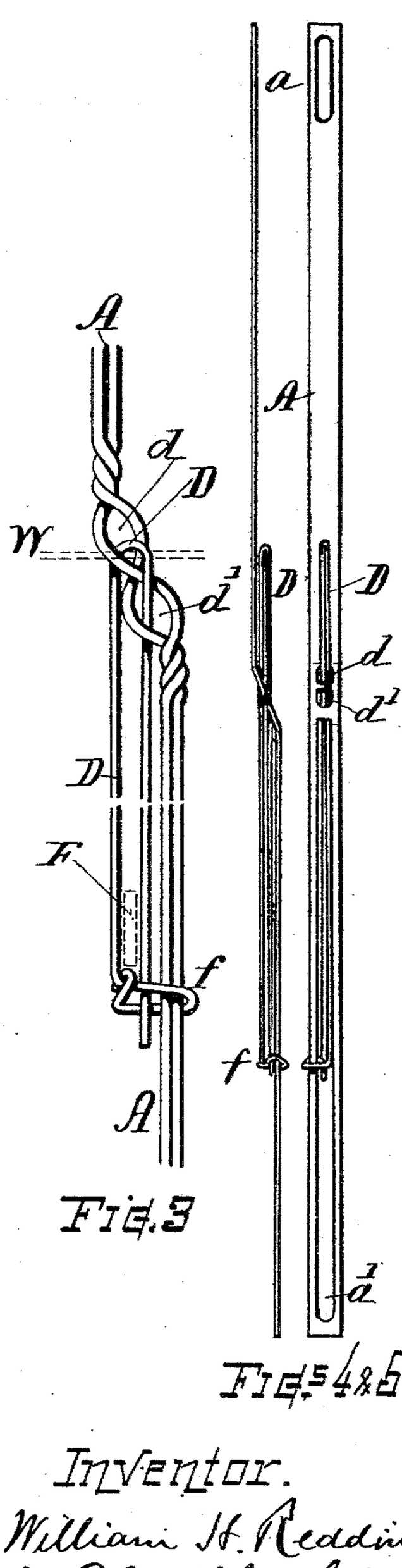

FIG. 3

FIGS. 4 & 5.

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DOUP-HEDDLE FOR LENO-WEAVING.

SPECIFICATION forming part of Letters Patent No. 571,795, dated November 24, 1896.

Application filed March 10, 1896. Serial No. 582,672. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. REDDING, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Doup-Heddle for Leno-Weaving, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of this invention is to provide a more efficient and durable device for the purpose named; also, to provide a heddle with a wire doup supported and guided thereon, as more fully hereinafter explained.

Another object is to provide, in combination with the heddles having the sliding doups thereon, means for weighting or depressing the doups to afford a proper degree of tension therefor.

These objects I attain by the heddle mechanism illustrated in the drawings, wherein—

Figure 1 is a side view of the heddle. Fig. 2 is a front view of the heddle, together with a portion of the harness-frame, showing the manner of combining the heddle and doup-depressing devices. Fig. 3 is an enlarged or detail view showing the manner of arranging the doup upon the heddle; and Figs. 4 and 5 show, by side and front views, the modification of the heddle as made from a flat metal strip.

Referring to parts, A denotes the heddle, having the open ends *a a'*, whereby it is supported on the rods *b b* in the harness-frame B, and also provided with a double central eye or guide-openings *d d'*, as indicated.

D indicates the doup, which is formed of wire or a metal strand folded at the top to form a loop or eye for the warp-thread W, and having its parts brought together and extended downward through the openings *d d'* in the heddle A, and, according to my invention, having its lower extremities joined by means of a loose running clasp, turn, or connection *f* about the wire of the heddle or one strand thereof, so that the doup D can move freely up and down thereon, it being supported and guided by the eyes *d d'* and the clasp *f*. The doup is shown as elevated in Fig. 1 and as depressed in Fig. 2.

F indicates a small bar arranged through or engaging with the foot of the doup D for normally depressing the same. Said bar may extend across the harness-frame and engage all or any desired number of the doups in a row of heddles, and its ends are best arranged in movable connection with guide-wires G, suitably attached to the frame and having light springs H combined therewith for normally pressing down the bar.

An adjustable collar *h*, or other suitable means, is provided for regulating the tension of the spring H as required in any instance, and a stop *k* is disposed beneath the bar for limiting the downward action of the bar F and doups D. A spring of very light tension is ordinarily sufficient to depress the bar F and heddle-doups D, and in some instances even the bar of its own weight may be sufficient. In other instances the heddles may be used without the bar F, the gravity of the doup or a slight weight added to the lower part thereof being depended upon for the normal depression of the same.

The heddle A is preferably made of wire twisted to form the eyes *d d'*, as in Figs. 1, 2, and 3, but in some instances it can be made of flat band metal, with the eyes and doup-guiding slot punched through the same, as shown in Figs. 4 and 5, the doup D being of wire or metal and arranged to slide up and down the heddle, as above set forth. When made as shown in Fig. 2, the doup can be threaded to pass either to the right or left, as indicated by dotted lines *r* and *l*. If made of flat form, then the heddles may be set in the harness with their inclined portions at either right or left position, as required for weaving any particular pattern.

Leno or cross weaving is well known in the art, and is effected by a doup action that crosses warp-threads between the picks of the weft-threads. For this purpose doups threaded in the heddles and connected with a separate harness-frame have been employed; also frames carrying needle-formed heddles have been employed for such purpose; but so far as I am aware a heddle having a wire doup mounted and guided thereon in the manner hereinbefore described has not been devised or known previous to the present invention, nor means such as described for depressing

or controlling the tension of the douping devices.

What I claim, and desire to secure by Letters Patent, is—

1. As an improved article of manufacture, a heddle having the doup-wire combined therewith, as described, said doup being mounted to move longitudinally, its looped end guided through the double eye, formed in the central part of the heddle, and the lower end of said doup joined by a loose sliding connection or running clasp with the lower part of the heddle-stem, substantially as and for the purpose set forth.

2. A heddle formed of wire twisted to form a double eye and obliquely offset at its center, and having a movable doup mounted thereon, the doup-wire folded to form a top loop, its two strands passed through the respective openings of the heddle-eye, and the lower end of said doup-wire loosely clasped about the heddle-wire to move freely thereon, for the purpose set forth.

3. The combination, of the heddle, the doup formed of wire mounted thereon, the heddle forming a guide for the foot of the doup in its upward and downward movement relative to the heddle, and a weighting device or bar disconnectedly engaging the foot of the doup for normally depressing the same, substantially as set forth.

4. The heddle having the longitudinally-movable doup mounted and guided thereon, the foot of said doup clasped about the heddle-wire, in combination with a depressing-bar extending through the harness, carried in the same frame with the heddle, and resting upon or engaging the foot of said doup, guides in connection with the harness-frame carrying the ends of said bar, and springs combined with said guides for acting upon said bar, substantially as set forth.

Witness my hand this 6th day of March A. D. 1896.

WILLIAM H. REDDING.

Witnesses:

CHAS. H. BURLEIGH,

ELLA P. BLENUS.