T. B. De FOREST. 2 Sheets--Sheet 1.

Machine for Setting Carriage-Springs.

No. 166,918. Patented Aug. 24, 1875.

Fig. 1

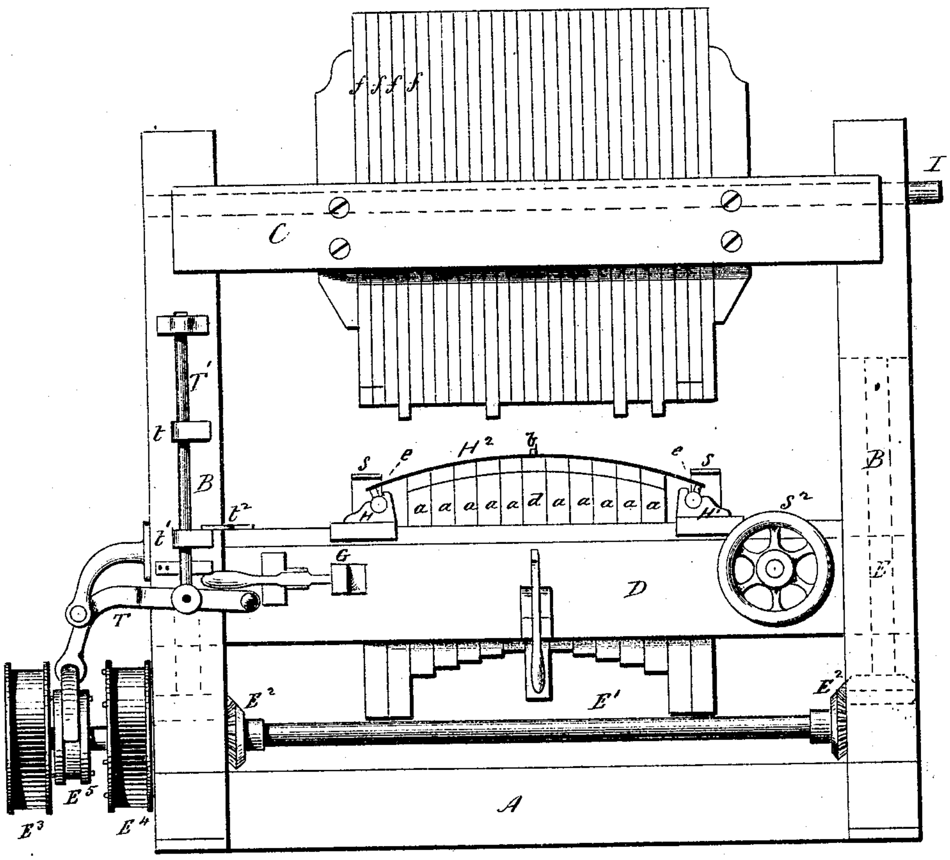
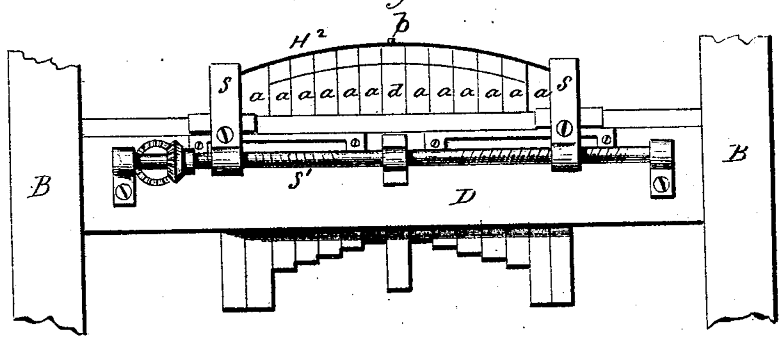


Fig. 2



Witnesses.
J. H. Shumway.
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Thos. B. DeForest.
Inventor.
By atty.
J. E. Earle

2 Sheets--Sheet 2.

T. B. De FOREST.

Machine for Setting Carriage-Springs.

No. 166,918. Patented Aug. 24, 1875.

fig. 4

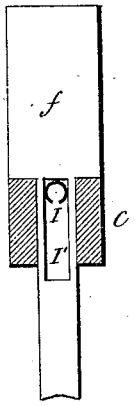


fig. 6

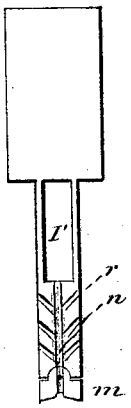
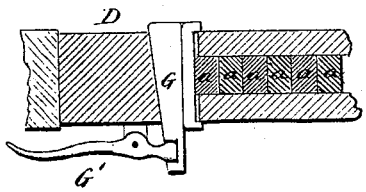


fig. 3



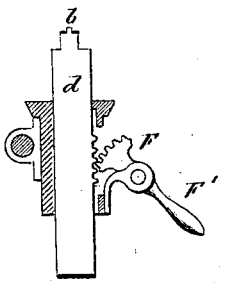
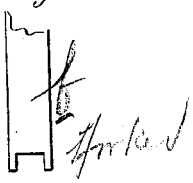


fig. 5



Witnesses.
H. Shumway
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Thos. B. De Forest
Inventor
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UNITED STATES PATENT OFFICE.

THOMAS B. DE FOREST, OF BIRMINGHAM, CONNECTICUT, ASSIGNOR TO SARAH A. DE FOREST AND JOHN S. PESSENGER, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR SETTING CARRIAGE-SPRINGS.

Specification forming part of Letters Patent No. **166,918**, dated August 24, 1875; application filed July 6, 1875.

To all whom it may concern:

Be it known that I, THOMAS B. DE FOREST, of Birmingham, in the county of New Haven and State of Connecticut, have invented a new Machine for Setting Carriage-Springs; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent in—

Figure 1, front view; Fig. 2, reverse side of the lower portion of the machine; Figs. 3, 4, 5, 6, detached views.

This invention relates to an improvement in machines for performing that part of the work on carriage-springs technically known as "setting"—that is, giving to the "back" and "leaves" the requisite curvature. The process of setting has usually been done by two men, who take the heated part of the spring and bend it over a thin former of about the same width of the spring and clamp the end firmly thereon; then each man (one on each side) takes a pair of tongs and continually bites or pinches the spring and former from end to end until the spring is completely set down upon the former. This is a very laborious operation, and necessarily slow, as must be all hand-labor.

The object of this invention is to mechanically set the spring; and it consists in an adjustable former composed of a series of vertical sections, so that different curvatures may be given to the former, combined with a corresponding series of vertical weights, toward and against which the former rises, so that the said weights beginning at the center will successively bear upon the spring from the center outward, and mechanism for operating the said combination, all as more fully hereinafter set forth.

A is the bed of the machine, from which rise two uprights, B, connected at the top by a beam, C. D is a slide, arranged between the uprights, so as to move freely up and down, and is so moved by a vertical screw, E, at each end, driven by the driving-shaft E^1 through pinions E^2, as seen in Fig. 1. This shaft is caused to revolve by power applied to the pulleys E^3 and E^4, running in opposite directions loosely on the shaft, and caused to engage with the shaft by a clutch, E^5, thrown into either pulley according to the direction in which the slide is to be moved, in the usual manner for imparting reverse motion to a driving-shaft through oppositely-revolving pulleys. On the slide D the former is arranged, consisting of a series of vertical pieces, *a*. The center one *d* has combined with it a segmental rack, F, (see Fig. 4,) actuated by a handle, F′, so that by raising or lowering the lever the center-piece *d* will be raised or lowered accordingly. This center-piece is provided with a stud, *b*, corresponding to the center perforation in the leaves of the spring. The several pieces *a* are clamped by a transverse key, G, as seen in Fig. 3, the friction of the one upon the other thus produced being sufficient to retain them in any position in which they may be adjusted. On the top of the slide D are two adjustable holders, H H^1. These are each constructed with a hook or stud, *e*, to engage with the respective ends of the former-plate H^2, and are arranged so as to slide freely longitudinally on the slide D.

This former is substantially that usually employed for setting the first leaf or back of the spring. Its two ends are engaged with the holders H H^1, and then the center-piece *d* is raised until the requisite curvature is given to the former; then the other pieces *a* are brought up close against the under side of the former and there securely clamped to hold them in that position. The key G, which thus clamps the former pieces is arranged to be actuated by a lever, G′, but any other clamping device which will hold the former pieces in place will serve the same purpose.

In the beam C there is arranged a succession of weights, *f*, directly over the former; these are independent of each other, and so as to be moved vertically independent of each other. After the leaf to be set has been placed upon the former, the driving-shaft is thrown into gear to cause the slide D to rise, carrying the former with the leaf up to the weights *f*, the center striking first, and so on each successive weight to the right and left, until the whole surface of the leaf is borne

upon by the weights, and these weights are sufficiently heavy to force and set the leaf down upon the former. In order to retain the leaf in its proper horizontal position on the former during the process of setting, several of these weights are forked at their lower end, as seen in Fig. 5, so as to extend down each side of the leaf and prevent its being turned out of line. In order to provide for slight transverse irregularities in the surface of the leaf, the weights are constructed with a hinged end, *m*, as seen in Fig. 6; but in any case the end of the weights is made concave transversely, as seen in Fig. 4, so as to insure a firm bearing upon the edge of the leaf to be set. I is a water-tube running in from one side and through slots I′ in the weights, as seen in Fig. 4. This is perforated, so as to allow water to escape onto the weights, and the weights are constructed with vertical grooves *n* between them, as seen in Fig. 6, through which the water will run onto the spring. So soon as the spring is completely forced onto the former by the weights, water is permitted to flow into the tube I, and discharged down onto, and so as to cool, the spring, and complete the setting operation; then the former is lowered, the leaf removed, and the second introduced, and so on. In order to allow the steam to escape, which will naturally be generated from the water which flows onto the hot leaf, upwardly-inclined transverse grooves *r* are made in the side of the weights from the water-passage. The number of weights introduced into the machine are sufficient for the longest leaf; therefore, when a shorter leaf is to be set a portion of the weights should be removed. To do this two adjustable stops, *s*, are arranged upon a right-and-left screw, S^1, upon the back side of the machine. These stops, extending forward beneath the weights, are adjusted by turning the hand-wheel S^2 upon the front of the machine, so as to bring them close up to the end of the leaf to be set, and so that, when in that condition the slide D and the former are raised, these stops will strike the weights outside the extent of the leaf to be set, and raise those out of the way. In order to make the connection or disconnection of the power automatic, the clutch is attached to a lever, T, from which a rod, T′, extends vertically, and on this is an upper dog, *t*, and a lower dog, t^1, and on the slide an arm, t^2, which, when the slide is raised to its highest point, will strike the dog *t* and throw off the power, and when it is returned will strike the lower dog t^1 and disconnect the power at its lowest point, it being thrown into gear for movement by the hand of the operator.

The former, as before described, may be used to advantage in the usual hand or other process. I therefore do not confine this construction of former to the particular setting apparatus herein described.

The succession of weights may in like manner be used with other formers. I therefore do not confine these weights to the particular former herein described.

I claim—

1. In combination with a former for setting carriage-springs, a series of vertical weights arranged to force the leaf onto the former, substantially as set forth.

2. In combination with a former for setting carriage-springs, a series of vertical weights, the lower or bearing ends constructed transversely concave, so as to bear upon the edges of the leaf, substantially as described.

3. In combination with a former for setting carriage-springs, a series of vertical weights, the lower ends of which are hinged, so as to turn transversely, substantially as described.

4. In combination with a former for setting carriage-springs, a series of vertical weights constructed with internal grooves, and provided with a water supply, so as to allow a free flow of water onto the set spring.

5. In combination with a former for setting carriage-springs, and a series of vertical weights for forcing the leaf onto the former, the adjustable stops S S^1, substantially as and for the purpose described.

THOMAS B. DE FOREST.

Witnesses:

S. M. GARDNER,

SARAH A. DE FOREST.