(No Model.)

S. W. BALDWIN.

JAW SPRING FOR ANIMAL TRAPS.

No. 393,809. Patented Dec. 4, 1888.

Fig. 1.

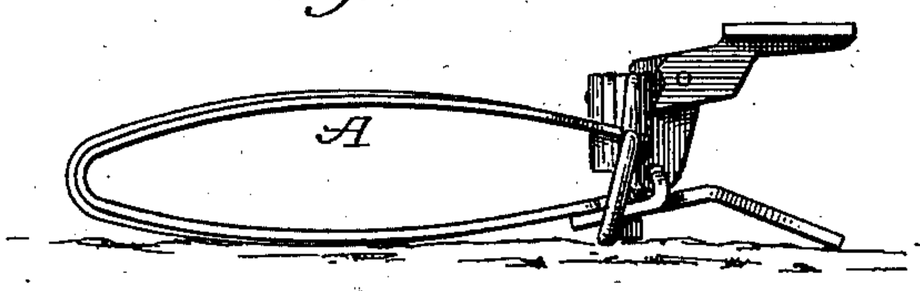


Fig. 2.

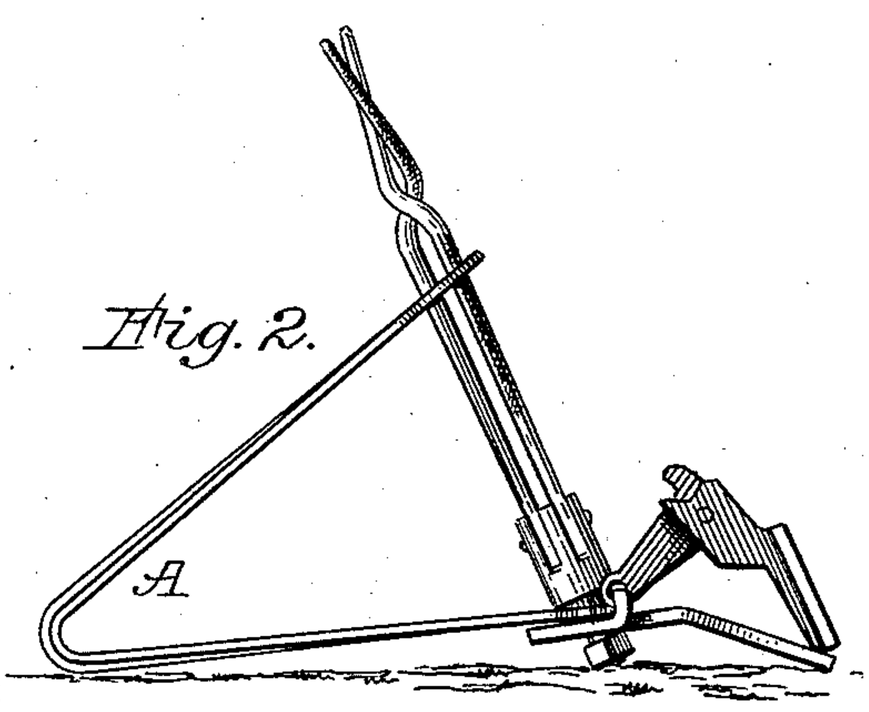
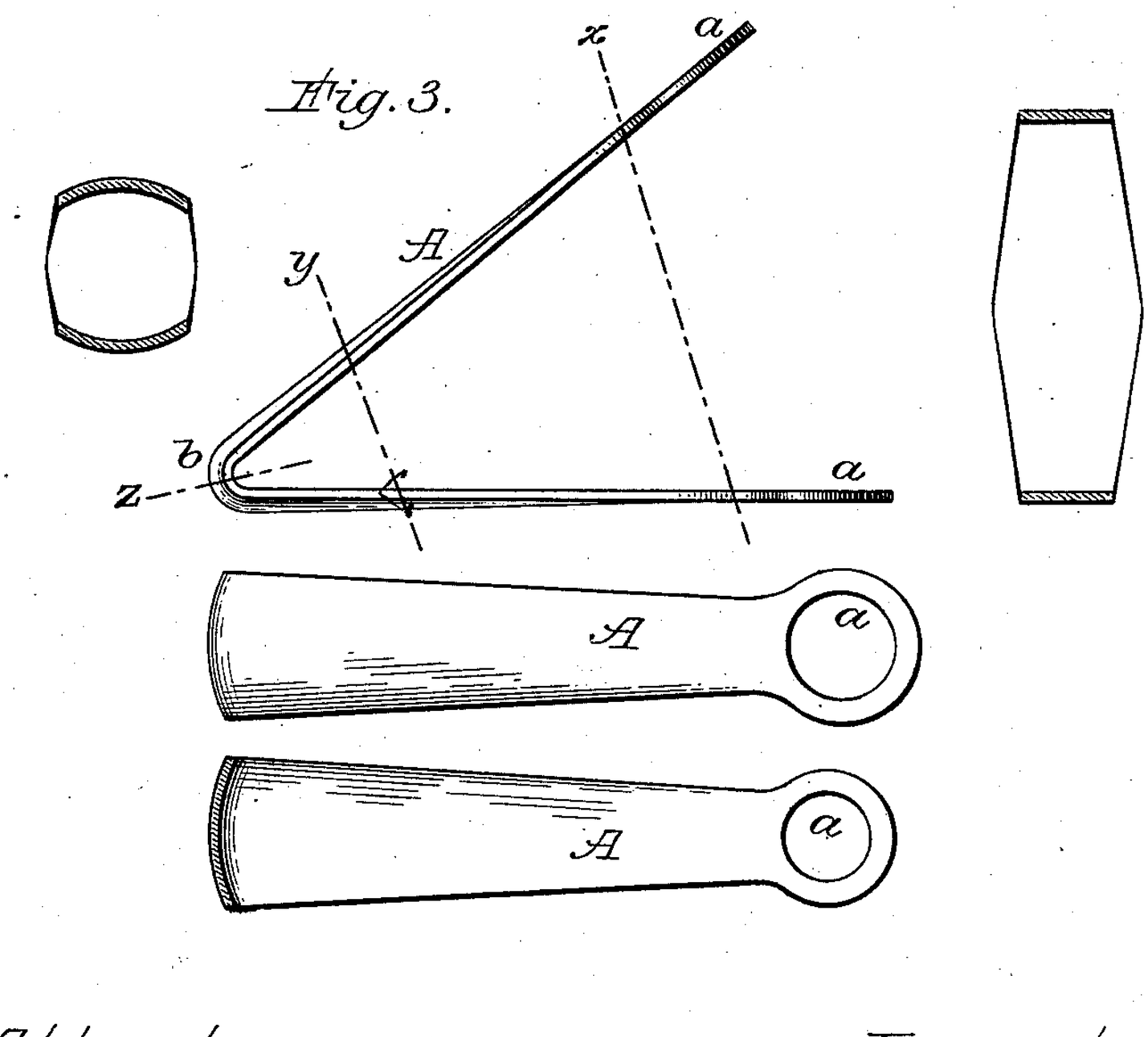


Fig. 3.



Attest:
Philip F. Larner.
Howell Battle.

Inventor:
Stephen W. Baldwin.
By Wm. C. Ward
Attorney.

UNITED STATES PATENT OFFICE.

STEPHEN W. BALDWIN, OF YONKERS, NEW YORK.

JAW-SPRING FOR ANIMAL-TRAPS.

SPECIFICATION forming part of Letters Patent No. 393,809, dated December 4, 1888.

Application filed October 19, 1888. Serial No. 288,563. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN W. BALDWIN, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Jaw-Springs for Animal-Traps; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

It is well known that springs for closing the jaws of animal-traps are what may be termed "V-shaped," in that they have two arms, generally of equal length, integrally united at what may be termed the "bottom" of the V, although at said junction the line may be more or less rounded at the bend. It is to this class of springs that my invention is restricted; and the objects of my improvements are mainly to render such springs more durable than heretofore, as well as to secure greater efficiency in holding-power than has heretofore been attained by the use of springs of corresponding weight, size, and character of steel. So far as my knowledge extends this class of jaw-springs has been formed by simply bending flat sheet-steel previously set to form, resulting at the junction of the arms of the springs in an outer surface, which is slightly concave laterally, because of slight rearward projections of the metal at each edge. Now it is well known that a large majority of the breaks in these springs are located at the junction of the arms, initially appearing in cracks at one or both edges and soon thereafter developing into destructive fractures.

The objects of my invention are attained by rendering this heretofore weakest part of the spring as strong as or stronger than any other portion without increasing the weight of the spring or materially adding to its cost, and at the same time to secure that high and powerful resiliency which is necessary for enabling a spring to maintain its effective jaw-closing power during the frequently long-extended times that a trap must remain in its set condition, as well as its jaw-holding capacity after closing upon a captured animal. To these ends I have devised a V-spring, which at the junction of its arms is laterally concave at the inner side of the spring and convex on the outer side. The metal at this point is incapable of being developed into the form indicated by mere bending operations, and the die working or swaging essential for developing this form results in more or less improvement in the density of that portion of the metal. In order that the strain on the spring when set will be as uniform as possible throughout all portions thereof, I extend this concavo-convex construction from the junction toward the free ends of both arms, gradually merging the lateral curves into flat surfaces near said ends, in which the usual round eyes or holes are provided, and hence with my improved springs the arms when set assume more even and more symmetrically curved lines than is possible in ordinary springs of corresponding size and weight.

In this connection I deem it proper to state that for many years elliptic, as well as half-elliptic, springs have embodied one or more plates, which in both directions from their bearing-points were laterally concavo-convex, and that sometimes the convexity was at the outer surface of the plates and at others at the inner surface. Elliptic springs have also heretofore been composed of concavo-convex plates, each of which extended from the middle or bearing-point throughout the entire length of the spring back to the middle again; but in those springs the concave surface was on the outer side of the spring, and therefore at the two abruptly curved ends the exterior surface was concave, and hence they were exactly the reverse of the form of my springs at the junction of their arms, and said elliptic springs presented at their ends the feature which, when in a trap jaw-spring, involves the very defects and objections which I overcome by my invention.

It will be obvious that the operation of an elliptic or half-elliptic spring is quite unlike that of a V-spring with respect of the manner of bearing the strains imposed thereon, and the duty imposed upon a trap-spring of the V form is radically unlike the duty performed by elliptic or half-elliptic springs, as in ordinary vehicles or railway-cars, and I know of no prior spring of any kind, regardless of the use for which it was designed, involving two arms, the free ends of which on being loaded approached each other, in which, at the junction of the arms, the spring was

laterally convex on the outer surface and concave on the inner surface.

To more particularly describe my invention, I will refer to the drawings, in which—

Figures 1 and 2 illustrate my improved jaw-springs applied to animal-traps, one being set and the other sprung. Fig. 3 illustrates my improved spring detached in side view, top view, and also in several cross-sections at the points indicated by dotted lines.

In Figs. 1 and 2 I have shown my springs as when embodied by me in what is known as the "Alexander" traps, (see Letters Patent No. 371,728, October 18, 1887;) but it is to be understood that my improved springs are of equal value for use throughout that general class of traps included within the general terms "steel traps" or "jaw-traps," wherein the catching and retaining devices are actuated and controlled by the separating action of a two-armed spring integral at the junction of the arms, and which are therefore substantially V-shaped in form.

My improved jaw-spring A, as heretofore, at the outer or free end of each arm is provided with an eye or hole, *a*, requisite for securing the spring to other parts of the trap, and also for enabling the spring to properly control such arms or jaws as may be employed for catching and holding an animal.

In cross-section each arm is varied in form as follows: As at line *x*, near its free end, it is flat, as shown in Fig. 3, but from that point to the junction of the arms at *b* the form of each arm merges gradually from the flat form to the concavo-convex form, with the convexity at the outer sides or surfaces, it being less curved at line *y* than at the junction *b* on line *z*. In forming my springs it will be readily seen that the mere bending operation involved in developing the V form in jaw-springs as heretofore constructed cannot be relied upon by me, on account of the lateral contour of the spring at the junction of its arms, and therefore simultaneously with the bending of the metal it is swaged in dies, which, while developing the V form, also develops the lateral curvature to the precise degree desired not only at the said junction, but also in the arms.

It is at the two edges of the spring, at or near the junction *b*, that V-springs as heretofore constructed disclose their greatest defects and weakness, not only during the tempering of the steel and the subsequent severe shop tests to which they are subjected, but during their actual service in trapping. This I believe to be due largely to the fact that in bending flat metal into the V form each edge at the junction is projected slightly rearward, and the heavy setting strains to which the spring is subjected are so unduly borne by said edges that cracks are developed therein, sometimes even if the metal be practically solid, and all the more rapidly if slight and hardly noticeable flaws have been developed therein, as is liable during the bending and tempering operations. By making the spring convex at said junction *b* the metal at the adjacent edges cannot possibly be unduly strained, and as a matter of fact, all other conditions being equal, such breaks and defects as are common in the old form of springs are rarely found in my improved springs.

It is to be understood that the main results of my invention will accrue if the spring at the junction of its arms be laterally concavo-convex, with the convexity on the outer surface, regardless of the extent to which said curvature may be extended toward the free ends of either or both of the arms, although said arms are much improved when constructed as shown as compared with the ordinary flat arm.

The matter of securing in trap-springs the highest possible durability and efficiency coupled with minimum weight is of special importance in view of the usual remoteness of the trappers' haunts from sources of supply, and that many traps must be sometimes carried long distances on the backs of the trappers, and the breakage of a spring sometimes involves the loss of a pelt worth more than the trap. The manufacture of my improved springs involves a little extra cost as compared with the making of the ordinary V-spring; but the difference is unworthy of consideration in view of the valuable results attained.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A jaw-spring for use in animal-traps, substantially V-shaped in form, and which at the junction of the arms thereof is laterally concavo-convex the convexity being at the outer surface of the spring, substantially as described.

2. A trap-spring substantially V-shaped in form, having each of its arms flat near its free end and concavo-convex from said flat portion to the junction of the arms, the convexity being on the outer surfaces of the spring, substantially as described.

STEPHEN W. BALDWIN.

Witnesses:
THOMAS S. WILLIAMS,
MAUCE. SPILLANE.