

(No Model.)

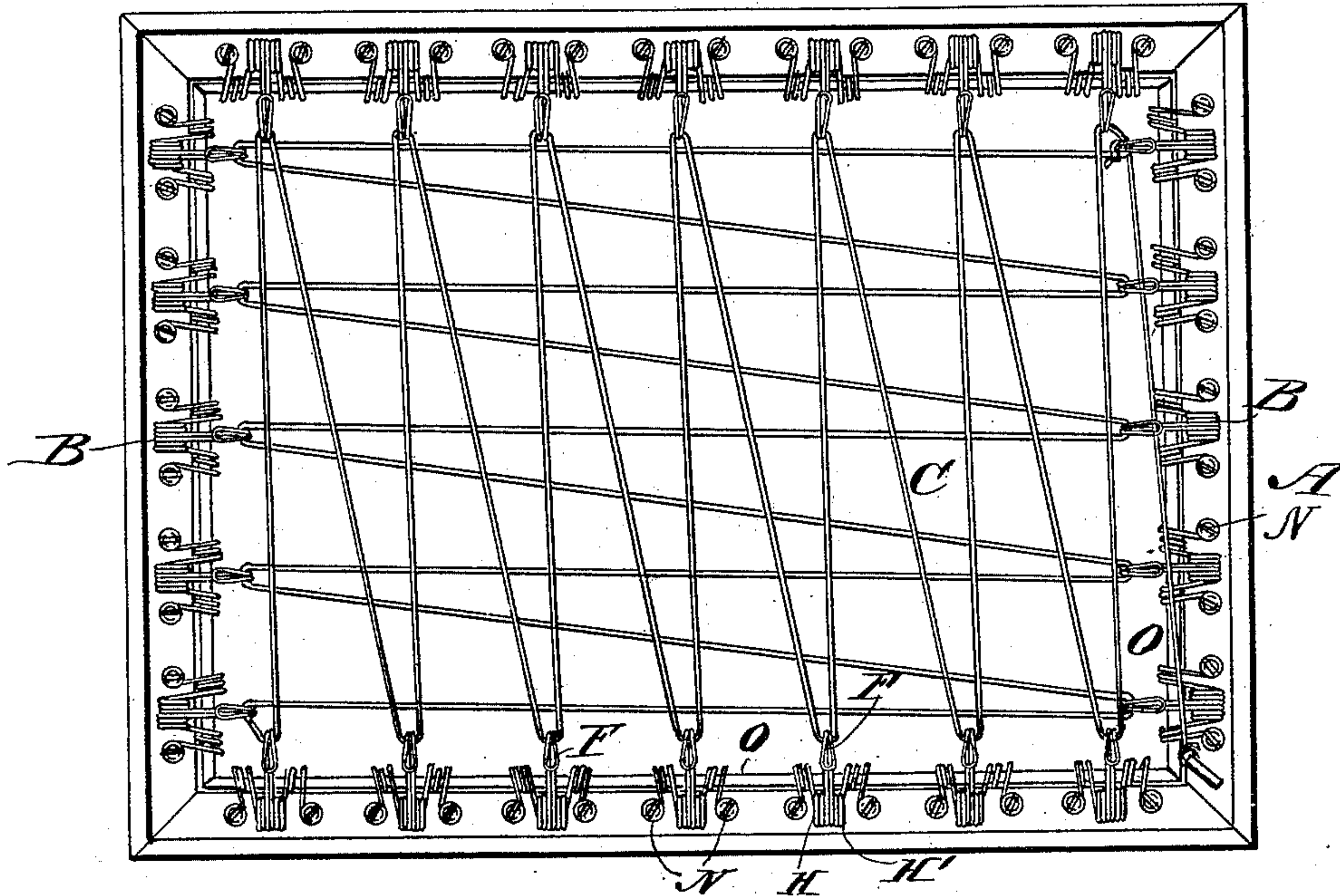
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J. S. BIERY.  
SPRING FOR BEDS, &c.

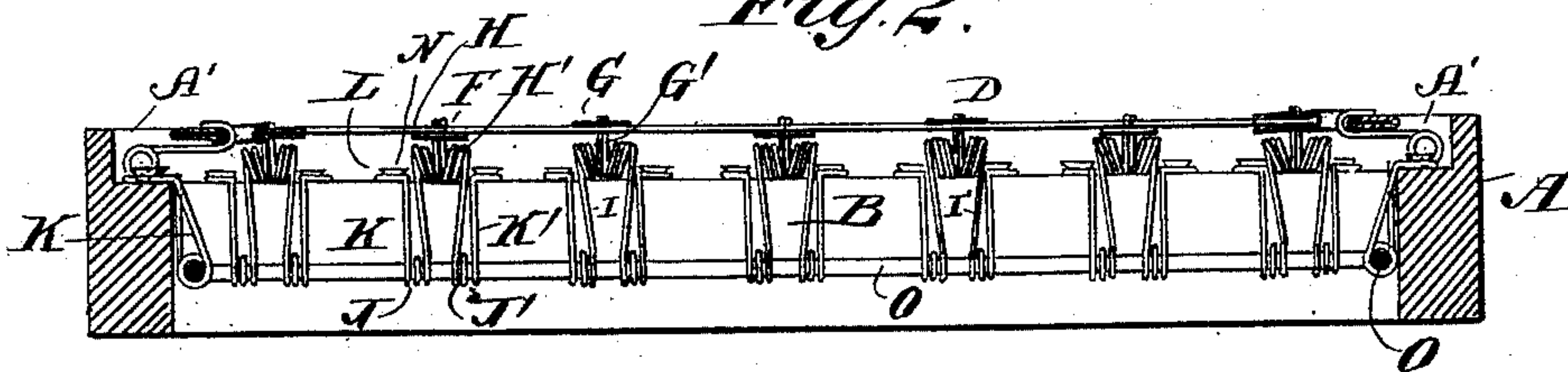
No. 421,230.

Patented Feb. 11, 1890.

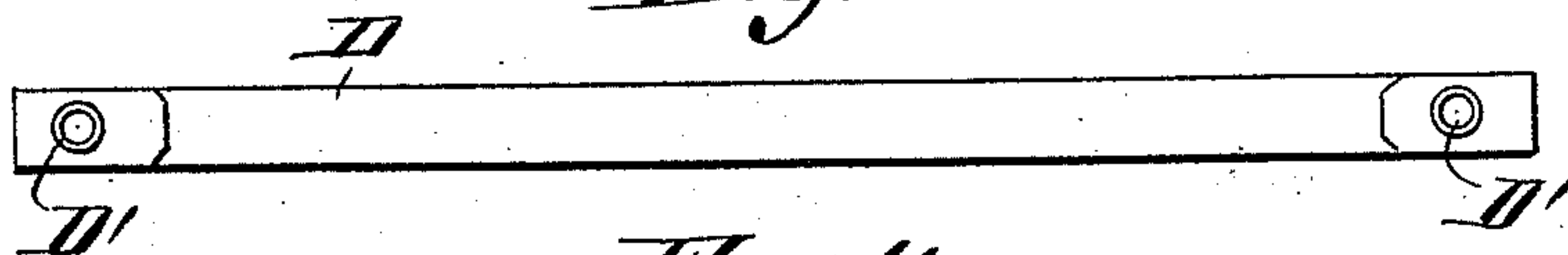
*Fig. 1.*



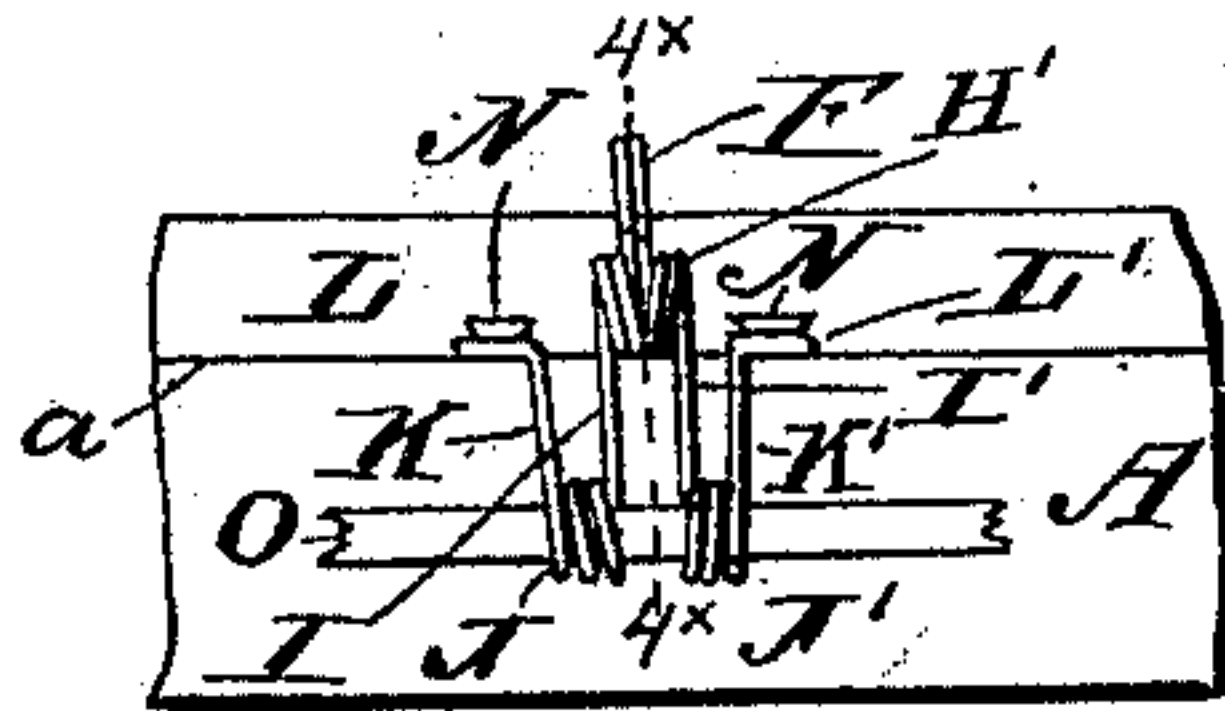
*Fig. 2.*



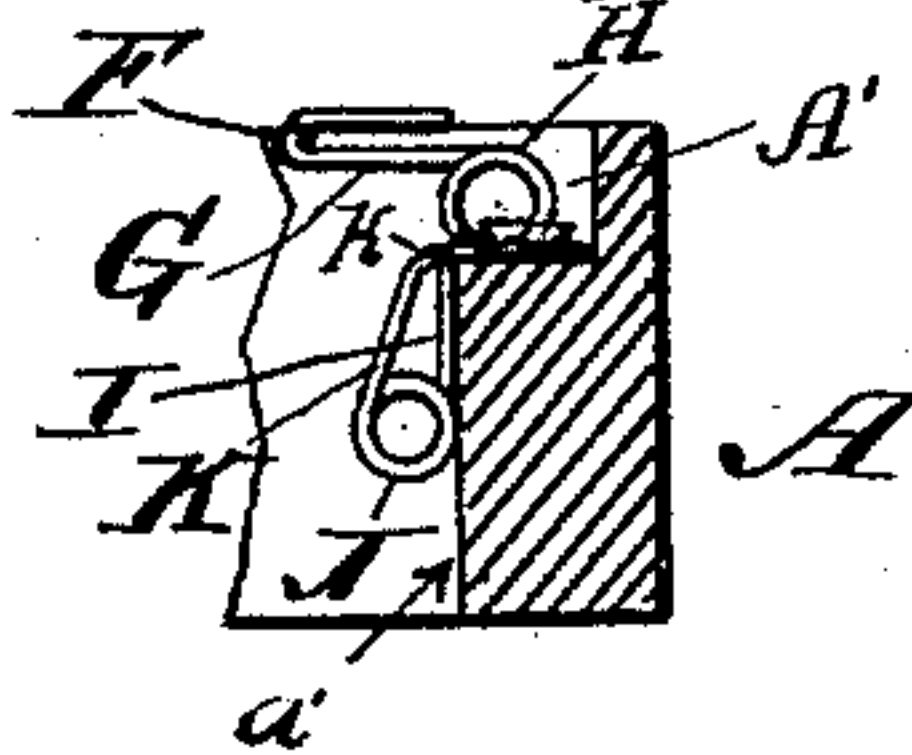
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



WITNESSES:

*F. M. Ardle*  
*C. Sedgwick*

INVENTOR  
*J. S. Biery*  
BY *Munn & Co*  
ATTORNEY

(No Model.)

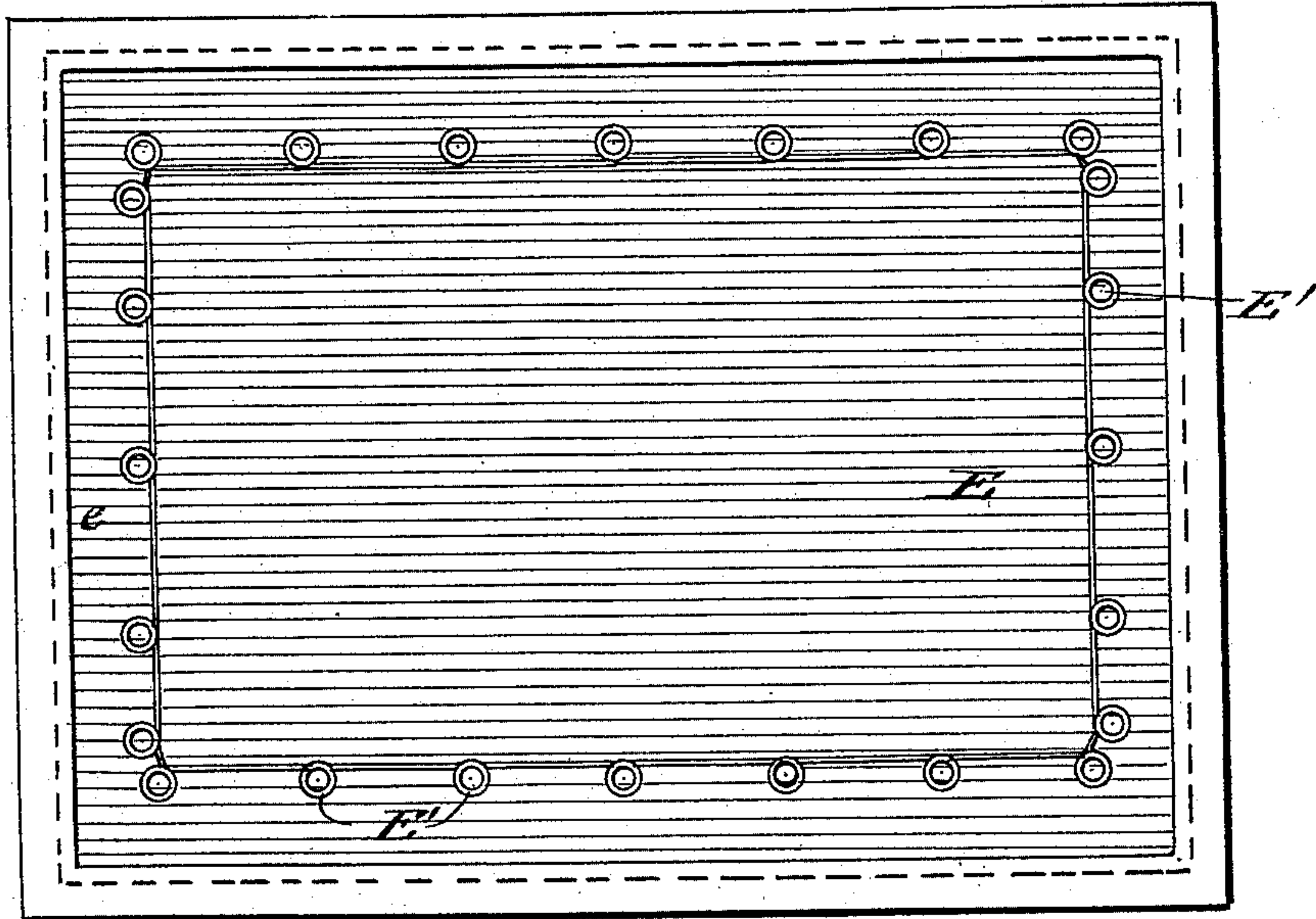
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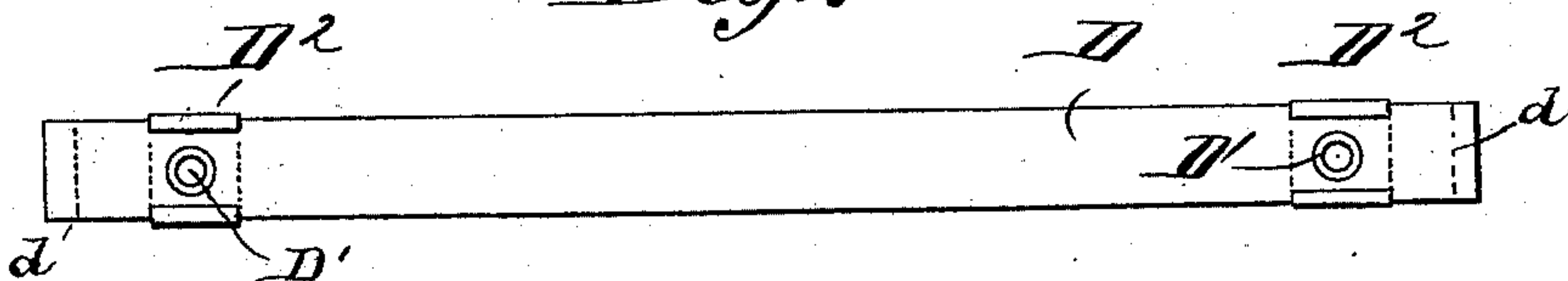
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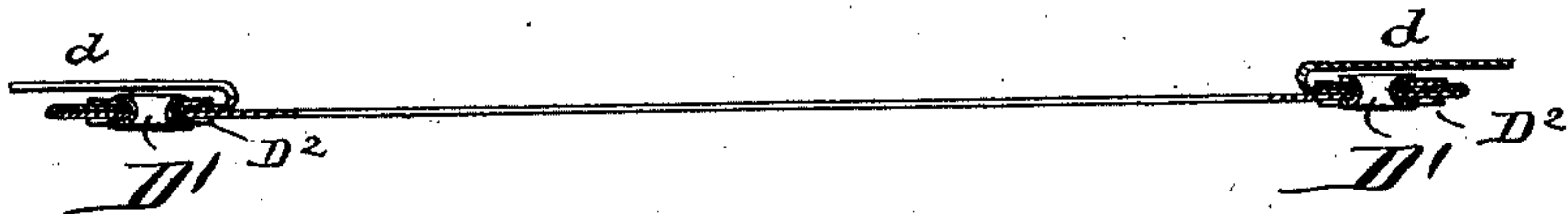
*Fig. 6*



*Fig. 7*



*Fig. 8*



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# UNITED STATES PATENT OFFICE.

JAMES S. BIERY, OF ALLENTOWN, PENNSYLVANIA.

## SPRING FOR BEDS, &c.

SPECIFICATION forming part of Letters Patent No. 421,230, dated February 11, 1890.

Application filed May 10, 1888. Serial No. 273,471. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES S. BIERY, of Allentown, in the county of Lehigh and State of Pennsylvania, have invented new and Improved Springs for Beds, &c., of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved bed-bottom, which is very simple and durable in construction, supporting the mattress evenly and being yielding to a very high degree.

The invention consists of springs of peculiar form secured on a frame and adapted to support a common bed-cord, strips of fabric, linen webbing, or net-work on which the mattress is spread.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement as used with common bed-cord. Fig. 2 is a sectional side elevation of the same used with strips of fabric. Fig. 3 is a plan view of one of the strips of fabric. Fig. 4 is a front view of one of the springs as applied to the frame. Fig. 5 is a sectional end elevation of the frame with one of the springs attached. Fig. 6 is a bottom plan view of a mat used in connection with the spring. Fig. 7 is a plan view of a modified form of connecting-strip. Fig. 8 is a longitudinal sectional elevation of the same.

On a suitably-constructed frame A, permanently or adjustably fitted together or on the rails of the bedstead, are secured a number of springs B, adapted to support common cord C, as shown in Fig. 1, or strips of a fabric D, as illustrated in Figs. 2, 3, 7, and 8, or a mat E, as shown in Fig. 6.

In bedsteads as commonly made the frame A is usually provided with a shoulder A', which has generally heretofore received the ends of the slats. In the present case, if the frame be not so provided, I propose either to cut the shoulder therein or to substitute rails already having such shoulder; but I find it

to be the rule instead of the exception that bedsteads now upon the market are so constructed, and therefore my improved spring can be generally applied thereto without necessitating any material change in the bedstead proper.

Each spring B is preferably made of spring-wire of suitable strength and flexibility, and the said wire, in order to form the spring, is first doubled and formed into a hook F in its middle. The wire is then extended horizontally to form the bars or rods G-G', of equal length, and which are continued into the upper side of the coils H H', respectively. After making one or more complete convolutions the wires are led forward from the lower side of the coils in a horizontal direction parallel to the bars G, bent sharply in a right angle, and then carried vertically downward to form the bars or rods I I', respectively, of equal length and standing at right angles to the bars or rods G G'. In their normal position the short horizontal arms and the lower edges of the coils H are adapted to rest upon the flat face of the shoulder A', the angle to fit closely over the corner *a* which such face makes with the inner face *a'* of the rail, and the vertical bars I I' to rest against said inner face *a'* of the frame, whereby the several parts are firmly sustained, and a direct downward pressure upon the hooks F will be resisted by the horizontal arms and coils H bearing upon the flat face of the shoulder A'.

The bars I and I' terminate in the coils J and J', respectively, and the wire then extends upward to form the rods K and K', respectively, bent near their outer ends at *k*, so as to rest upon the shoulder outside the coils H, and their extreme ends are formed into the eyes L and L', respectively, adapted to be secured by screws N or other suitable means to the top of shoulder A' in the frame A.

Through the lower coils J J' of the several springs B, along each side of the frame A, is preferably passed a rod or bar O, mitered to the rods or bars O of the adjoining sides of the said frame A, though this rod may be dispensed with, if desired, without necessarily destroying the efficiency of my invention. If now some flexible connection—such as the bed-cord, fabric strips, or mat hereinafter described—be stretched in the frame connect-



ing the several springs therein, the operation of my improved spring will be as follows:

The ordinary use of the bed wherein one person is sleeping will depress the bed-cord (for instance) in its center, resulting in a lateral tension upon the springs. In this case each spring will yield in its coils J, and the horizontal arms, right-angle bends, hook F, and coils H will all be drawn inward, revolving about the rod O as a center. It will be obvious that if this rod were not employed there might be also a slight yielding of the arms K, especially at their bends *k*; but this yielding would in no way interfere with the principal yielding occurring within the coils J.

In the case where two persons occupy the bed, or where a single occupant lies near one edge thereof, the operation of the spring will be slightly different. The bed-cord will be depressed at a point not in its center, and perhaps very close to the hook F at one side. At the other side of the bed the action will be substantially that described above; but at this side the force exerted, instead of being a lateral one, will be in a downward direction principally, with a slight inward tension. In this case the spring will yield in its coils H, permitting the hook F to bend downward, and the short horizontal arms will not ordinarily be drawn laterally off the shoulder A'. The spring therefore has a double function—viz., that of yielding horizontally to lateral tension and that of yielding almost vertically to vertical pressure upon the bed-cord near or directly over the hook. In the latter case, too, it possesses the additional advantage that the coils H bear directly upon the shoulder A', and a heavy downward pressure will be firmly resisted and sustained thereby. I may also continue the hook F into a complete eye; but this construction would be adapted for use only in connection with a bed-cord, as described in the following paragraph, whereas if the hooked form F be used the spring may be employed equally well with a great variety of flexible bottoms.

In the use of a common bed-cord C in connection with the springs B, as illustrated in Fig. 1, the hook or eye F serves to hold the cord, which is fastened with one end to the frame A or to an eye, and then passed from side to side of the frame A through the several hooks or eyes F, and then from end to end of the frame in a similar manner, so as to form a rest for the bed-mattress. The hooks F are preferably covered with a suitable material, so as not to injure the mattress or cut the bed-cord.

In the use of a canvas mat E in connection with the spring B the former is made of a size corresponding to the outside dimensions of the frame A above the shoulder, and is to cover the whole space of the bed from rail to rail. Eyelets E' are secured by suitable means to the under side of the said mat and placed such distances apart to correspond

with the hooks F of the springs B. The eyelets are adapted to be hooked onto the said hooks F, so that the springs B support the said mat E and hold it in place, and when in this position the flap *e*, or that portion of the mat outside the line where the rings are fastened to the hooks, lies over the rough upper edge of the coils H, over the points of the hooks, and over the sharp corners of the frame, thus preventing the mattress from wear thereon.

In the use of webbing or strips of fabric D, as illustrated in Figs. 2, 3, 7, and 8, in connection with the springs B, I provide the ends of the said strips with eyelets D', which hook over the hooks F of the springs B at the ends or sides of the frame A. The eyelet D' may be directly pressed into the strip of fabric D in the usual manner, and as shown in Figs. 2 and 3; or the said eyelet D' may be formed or fastened on a clip D<sup>2</sup>, (see Figs. 7 and 8,) of suitable material, and fastened to the strips D in any suitable manner near their ends, leaving, however, a small flap *d* projecting beyond the eyelet and clip, which flap will cover the coils H and protect the mattress from wear, the same as the flap *e* on the mat above described.

The strips D are first hung into the hooks F of the springs B, passing first from end to end of the frame A, so as to cover the whole breadth of the bed. Then other strips D of suitable length are hung into the hooks F of the springs B at the sides of the frame A and passed crosswise over the latter, and at the same time being interwoven with the strips D passed lengthwise, as above described.

In case net-work of suitable construction is employed, then it is hooked over the hooks F of the spring B, so as to cover the entire bed or frame A to form a rest for the mattress.

The bed-bottom as described can be used in the construction of spring-beds, spring-cots, spring-lounges, seats for chairs, and for other purposes, and may be placed thereon when such articles are manufactured; but I may make such springs separate and sell them as an article of manufacture, as they are capable of being very readily applied to bedsteads, lounges, cots, chairs, &c., already made and now on the market or in use.

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

1. As a new article of manufacture, a bed-spring composed of a single piece of spring-wire having two sets of coils, one set H adapted to yield a vertical pressure only, and the other set J adapted to yield to lateral inward pressure only, substantially as described.

2. The combination, with the support A, of the herein-described bed-spring, composed of a single piece of spring-wire having two sets of coils, one set H resting normally upon the top of said support and adapted to yield to vertical pressure only, and the other set J



resting against the inner face of said support and adapted to yield to lateral inward pressure only, said coils H being carried bodily inward and sliding upon the upper face of said support when the lateral pressure is exerted, substantially as described.

3. As a new article of manufacture, a spring for bed-bottoms, &c., the same consisting of a single piece of spring-wire bent double at its center and formed into a hook F, thence carried outwardly into horizontal arms G, thence continued into coils H, thence carried inwardly from the bottom of said coils into short horizontal arms, thence bent sharply downward and continued in vertical arms I, thence coiled inwardly into coils J, thence led upwardly and outwardly in arms K, bent at *k*, and provided with eyes at its ends by which it may be attached to the bed-frame, said coils H yielding to downward pressure and said coils J to lateral inward pressure simultaneously or independently, all as and for the purpose described.

4. The rail A, having the square shoulder A', in combination with the spring B, the latter consisting of a single piece of spring-wire bent at its center and formed into a hook F, thence led into coils H, adapted to rest normally upon the flat face of the shoulder A', thence bent over the corner *a* of said shoulder and led vertically downward and formed into coils J, thence carried upward and secured by screws N to the flat face of said shoulder, said coils H yielding to downward pressure and said coils J to lateral inward pressure, simultaneously or independently, all as and for the purpose described.

der and led vertically downward and formed into coils J, thence carried upward and secured by screws N to the flat face of said shoulder, said coils H yielding to downward pressure and said coils J to lateral inward pressure, simultaneously or independently, all as and for the purpose described.

5. The frame A, having the square shoulder A' in its upper inner corner, and the springs B, the latter each consisting of a single piece of spring-wire bent at its center and formed into a hook F, thence led into coils H, adapted to rest normally upon the flat face of the shoulder A', thence bent over the corner *a* of said shoulder and led vertically downward and formed into coils J, thence carried upward and secured by screws N to the flat face of said shoulder, in combination with a flexible bed-bottom adapted to be removably secured to the hooks of said springs, the latter yielding in their coils H to vertical pressure upon the bed-bottom approximately above said coils, and in their coils J to lateral force exerted upon them when the bed-bottom is depressed approximately in its center, all as and for the purpose hereinbefore described.

JAMES S. BIERY.

Witnesses:

ARTHUR L. BIERY,  
H. B. YINGLING.