

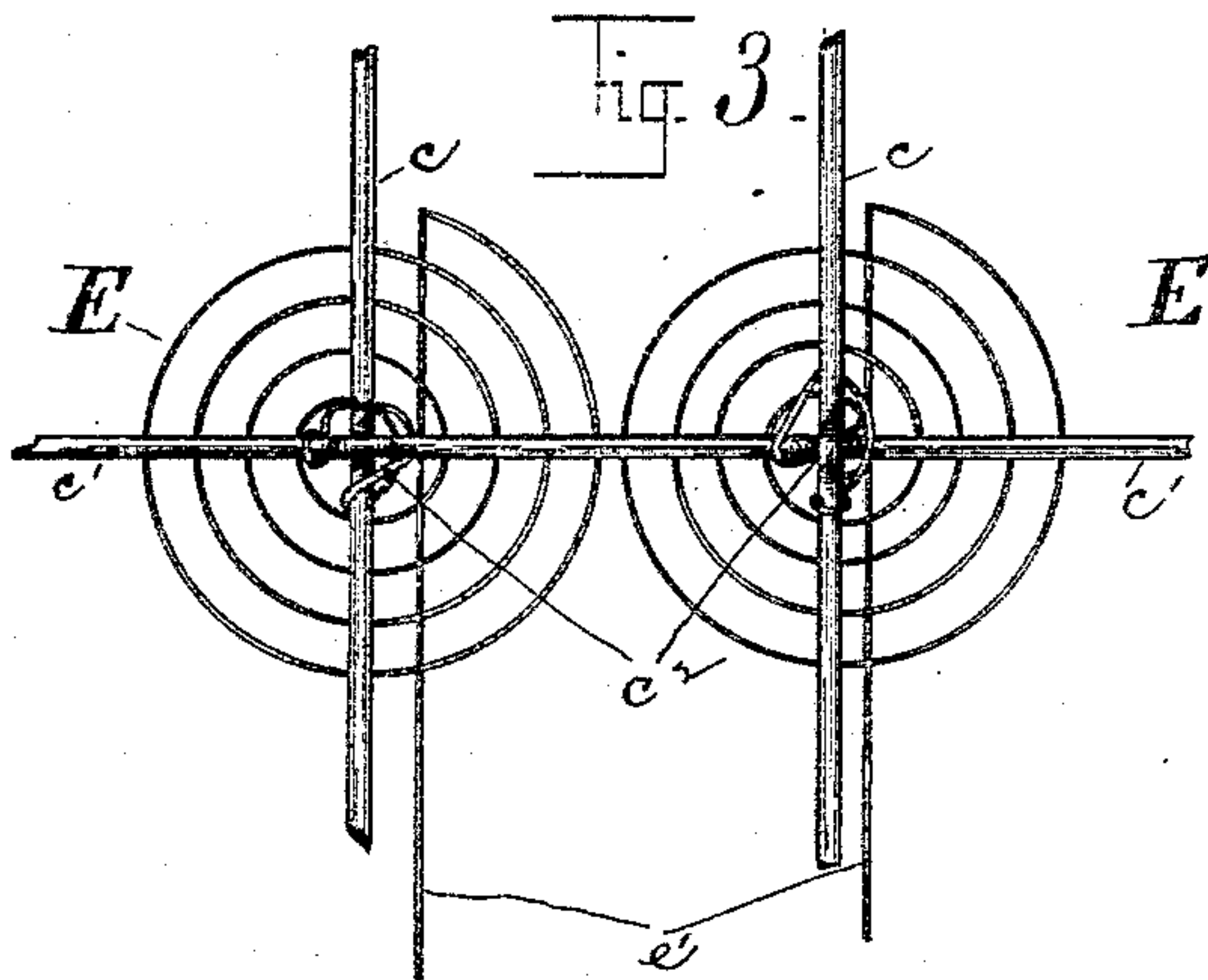
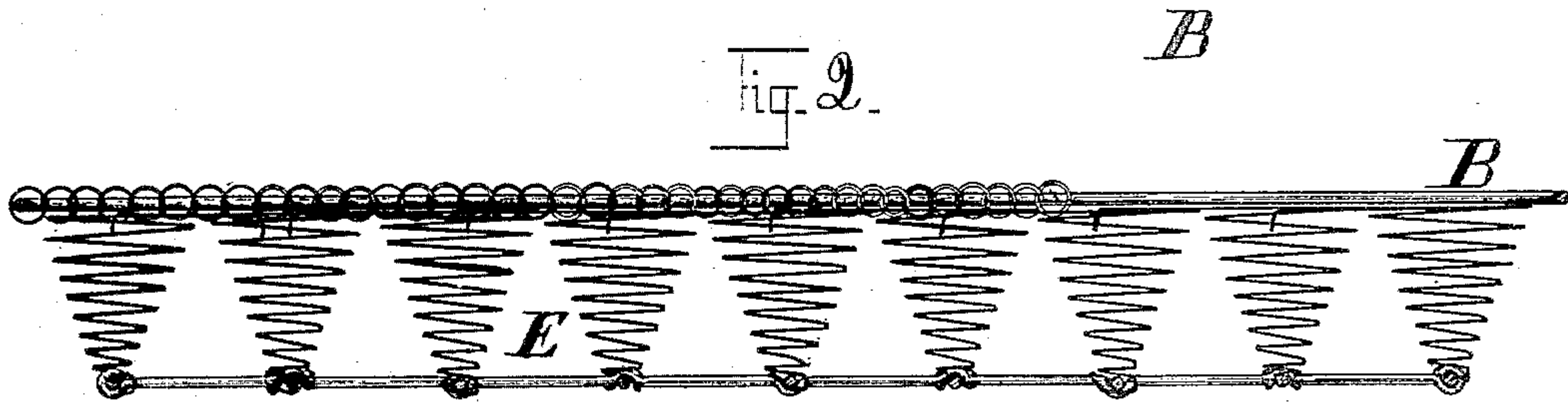
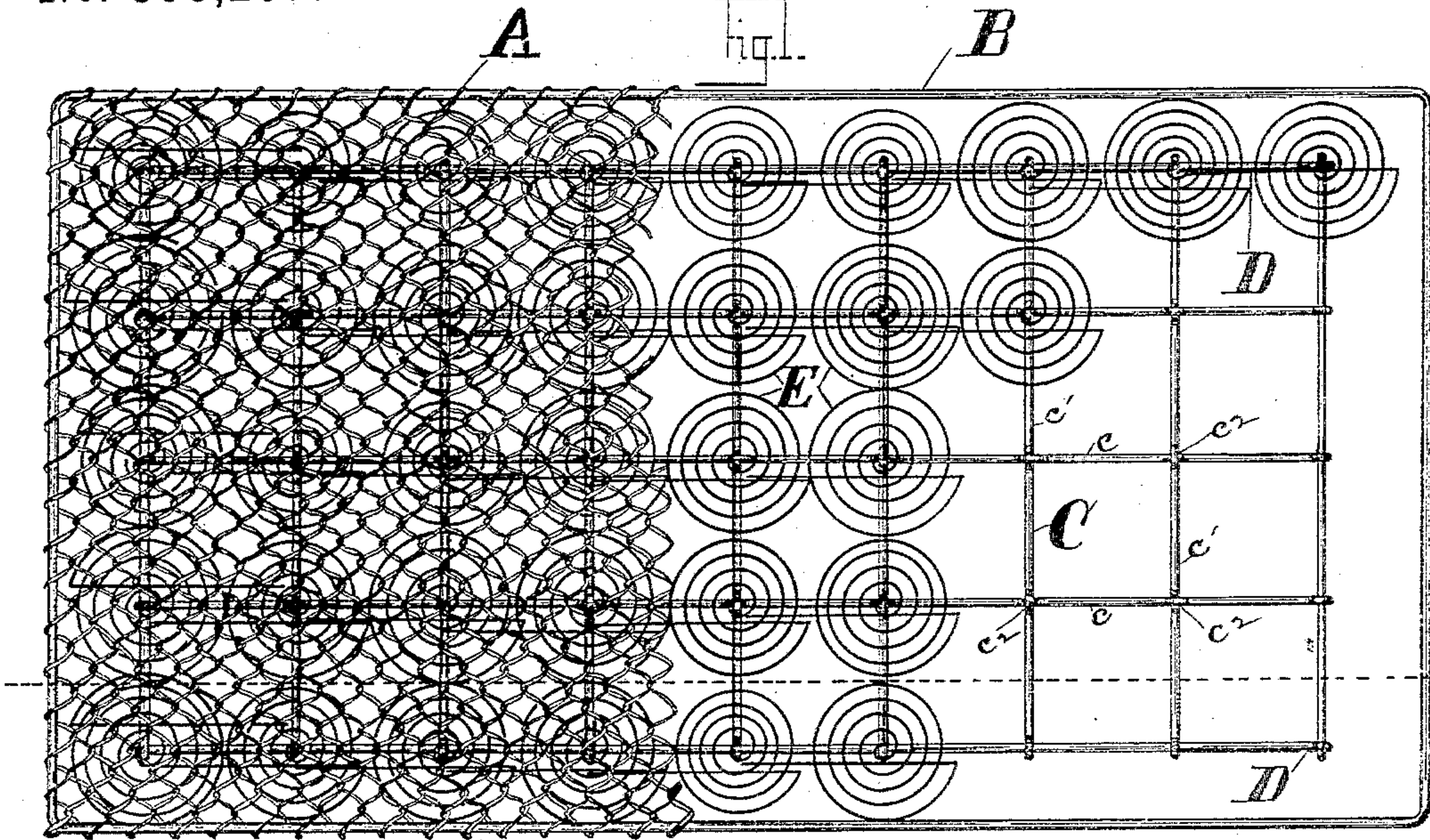
(No Model.)

D. H. GAIL.

SPRING BED.

No. 399,257.

Patented Mar. 12, 1889.



Witnesses,

C. B. Wash.

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Inventor

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By his Attorney
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UNITED STATES PATENT OFFICE.

DANIEL H. GAIL, OF CLEVELAND, OHIO, ASSIGNOR TO EDWIN J. FOSTER, OF
SAME PLACE.

SPRING-BED.

SPECIFICATION forming part of Letters Patent No. 399,257, dated March 12, 1889.

Application filed March 10, 1888. Serial No. 266,900. (No model.)

To all whom it may concern:

Be it known that I, DANIEL H. GAIL, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Spring-Beds and other Like Articles, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The object of my invention is an improved construction of spring-bed, sofas, car-cushions, chair-cushions, and other analogous articles.

I will describe the article in reference to its use as a spring-bed, though I do not mean to limit myself to such use, for, with merely the addition of the necessary upholstering the same structure in different form affords a most suitable structure or foundation for all kinds of upholstered articles—as lounges, car seats and backs, sofas, chairs, and the like.

My invention consists in the improvements hereinafter described and claimed.

Referring to the drawings, Figure 1 is a plan view of the mattress, certain parts being broken away. Fig. 2 is a longitudinal vertical section of the mattress, taken on the dotted line $x x$ of Fig. 1. Fig. 3 is a detail view, showing the improved mode of securing the spiral springs to the cross-bars.

A is a woven-wire mattress made in the usual manner as regards weaving, but having its strands running transversely of the length of the bed instead of longitudinally, as is ordinarily the case. Passing through the outer meshes of the mattress and entirely surrounding the same is the metal frame-work B, the two ends of which are secured to each other in any suitable manner. In securing the mattress to the outer frame, B, no tension or strain is brought to bear on the strands of the mattress, as is usually done, and hence when weight is placed on the mattress there is not such a tendency to straighten the strands as there is in a mattress that is stretched or tightly drawn before or at the time of being placed on or secured to the supporting-frame.

The lower metal frame-work, C, of the bed is composed of a series of wires or rods, $c c'$,

respectively extending longitudinally and transversely of the bed, their several points of intersection c^3 being formed by crimping them, whereby said rods at said points of intersection interfit, the respective ends of both wires being secured in any suitable manner to the outer rod, D. Intermediate of said frame-work and the woven-wire mattress I secure a series of spiral springs, E, one end of each of said springs being secured at a point of intersection of the respective rods $c c'$. By means of crimping the rods any slipping of the same is largely overcome. By the improved manner of securing the springs to the rods all possibility of slipping on the part of the springs is absolutely prevented, and any twisting of the frame-work of the rods and all lateral and longitudinal displacement of the latter relative to the frame-work are rendered impossible. The lower end portion of each of said springs is wrapped around or caused to encircle the rod to which it is contiguous to pass under or over the intersecting rod, then to pass under or over the said first rod again, and, finally, to encircle the intersecting rod. Thus each of said rods of the lower frame-work is enwrapped by the lower end portion of each spiral spring engaging therewith, and also has a secondary bearing against said end portion. The springs of one row have engagement, first, with the longitudinal rods, and of the alternating row the engagement is primarily with the transverse rods of the frame—that is, the free lower extremity of the spiral springs of one transverse row of springs is wrapped or bent or twisted first around the adjacent longitudinal rod, thence passes under the transverse rod that engages at that point with said longitudinal rod, thence is bent over the longitudinal rod on the side of the said transverse rod opposite to its first engagement with said longitudinal rod, and thence is bent under and around the said transverse rod on the opposite side of said longitudinal rod to its point of first engagement with said transverse rod. On the next row of transverse springs the engagement of the free end of the spring is with the transverse rod instead of with the longitudinal rod—that is, said free end is first bent or twisted around the transverse rod, thence under the longi-

tudinal rod, thence over the transverse rod on the side of the intersecting point of the two rods opposite to its first point of engagement with said transverse rod, and thence around the longitudinal rod on the side of the intersecting points of the two rods opposite to its first point of engagement with said longitudinal rod. Thus the two rows of spiral springs, having, as may be said, alternate engagement with the longitudinal and transverse rods relative to each other, act as braces, thereby preventing any slipping of the frame-work. Again, it will be seen I may, and in practice do, vary the engagement of the free extremities of said springs by having said extremities of the springs in one transverse row engage alternate sides of the intersecting point of the rods, thus adding an additional brace feature to their mode of fastening and further insuring a rigid lock between the springs and the frame. This is an important feature to prevent any twisting or displacement of the rod-frame in addition to its being the most secure manner of attaching the springs.

The first wrap of the lower extremities of the spiral springs is about the longitudinal rods. The succeeding row of springs is first wrapped about the transverse rods. Thus the manner of attachment or engagement between the springs and the rods is alternate and tends to act as an additional brace, the one bracing against transverse movement of the spring, the other bracing against longitudinal movement of the same. The upper end portion, e' , of each of said spiral springs is secured to the mattress in the following manner: A portion of the wire equal in length to the distance between the centers of the respective spirals is straightened parallel with the mattress. Said portion is then inserted between the several meshes of the mattress and its extremity is bent downward, said extremity coming substantially in the center of the spiral spring longitudinally adjacent to the first spring. The upper extremity of said adjacent spring is secured in the same way, and thus said several upper extremities conjointly form a practically continuous steel wire running longitudinally of the bed and serving to stiffen and strengthen the same. This mode of fastening the spirals at their upper portion is very efficient to prevent either longitudinal or lateral motion of the same. It should be noticed that the extremities e' of the spiral springs on the edge of the mattress also extend inwardly toward the longitudinal center of the mattress. The said upper end portion of the wire, it will be noticed, is straight when inserted between the meshes of the mattress; but as the latter has its strands extending transversely of the bed, and said strands are spirally woven into one another, it follows that although said end portion of the spring is merely slipped longitudinally into position and then bent downward at its extremity, yet it may properly be designated as woven into said meshes, inas-

much as it alternately passes over one strand and under the next one.

By means of the transverse direction of the mattress meshes, combined with the adjacent and supporting spiral springs, I produce a bed that will more readily and easily conform to the shape of a body recumbent thereon than the ordinary wire mattress that is stretched on a frame. In securing this mattress to the outer rod no strain or tension is brought to bear on the mattress, and consequently it is more limber and pliable than it otherwise would be, the supporting spirals providing the additional requisite stiffness. In the ordinary form of spiral mattress the greatest depression occurs at the point of greatest weight, the mattress thence rising in a gradual and unbroken curve to the supporting frame-work. For instance, the greatest depression in the ordinary form of mattress is either at the point occupied by the hips or at the point occupied by the shoulders of the sleeper, and the mattress intermediate of the two points would be equally depressed; but in my form of mattress there would be a depression caused by the hips and another by the shoulders, while the intermediate portion would be raised above said points by reason of the strands of the mattress extending transversely and not being stretched to a position and because of the supporting-springs. Thus it conforms to the exact contour of the body, affording a more easy support for the same.

Another feature of great utility in my invention is its great strength. The rods of the lower frame-work have crimped bearings against each other at each point of intersection, and each said point is in turn immovably secured to the lower portion of its engaging spring, while the upper portions of the spirals have interwoven attachments to the meshes of the mattress, securing the upper extremities of said spirals and affording additional longitudinal strength and stiffness to the bed.

By reason of my making my lower frame-work of metal circular in cross-section and crimping the rods at their points of intersection in addition to my improved manner of securing the spiral springs to the frame-work and binding the frame-work together I obtain great rigidity and stiffness of the frame-work with a much less size and weight of metal, thus greatly cheapening the cost of construction.

As the complete structure is of lighter weight, it can the more readily be placed in position on a bedstead and removed therefrom, and as the component parts are of less transverse area than usual there is less opportunity for the deposit of dust and dirt, and by reason of its open structure a greater opportunity is afforded for properly cleaning and dusting the same.

The outer peripheries of the spiral springs at their upper portion closely engage with

and support the outer edge of the mattress and the outer supporting frame-work and afford a yielding but stable support for the edge of the mattress.

5 It will be understood that I do not limit myself to the incorporation of my invention in spring-beds, though I have described said invention as applied to a spring-bed, said improvements being equally applicable to cushions, car-seats, sofas, upholstered articles, &c., as has been before stated.

10 The foregoing description and accompanying drawings set forth in detail mechanism in embodiment of my invention. Change may, therefore, be made therein, provided the principles of construction respectively recited in the following claims are retained and employed.

20 I therefore particularly point out and distinctly claim as my invention—

1. The combination of a woven-wire mattress and a series of spiral supporting-springs, the upper extremity of said springs being woven into the mattress in a right line, the 25 extremity of one spring engaging with the extremity of an adjacent spring of the series, whereby said extremities form a substantially continuous wire interwoven in the mattress, substantially as set forth.

30 2. The combination, with a woven-wire mattress, of a series of spiral supporting-springs, the upper extremities of said springs being woven into said mattress in a right line parallel to one of the boundaries of the mattress, 35 the extremity of one spring overlapping the extremity of the adjacent spring of the series, whereby said extremities form a substantially continuous wire interwoven in the mattress, substantially as set forth.

40 3. The combination, with a frame-work composed of intersecting rods circular in cross-section and crimped at their intersecting points, of a series of springs secured at the points of intersection, one or more of said 45 springs having a double engagement with both the longitudinal and the transverse rods of said frame-work, the double engagement with the transverse rod being on opposite sides of the longitudinal rod, the double engagement with the longitudinal rod being on opposite sides of the transverse rod, substantially as set forth.

50 4. The combination, with a frame-work com-

posed of intersecting rods crimped at their point of intersection, of a series of springs secured at said intersecting points, one spring 55 passing over the longitudinal rod, thence under the intersecting rod, thence again over the longitudinal rod, and again engaging with the intersecting rod, the adjacent spring of the series having an alternate engagement 60 first around the intersecting rod, thence under the longitudinal rod, over intersecting rod, and again engaging with longitudinal rod, the engagements of the springs with the intersections thus forming a brace one to the 65 other, substantially as set forth.

5. The combination of a woven-wire mattress, a metallic supporting-frame composed of rods circular in cross-section and crimped 70 at their points of intersection, a series of spiral supporting-springs intermediate of the mattress and supporting-frame, said springs respectively located at said intersecting points, the upper extremity of said springs respectively being woven into said mattress in a right 75 line, the upper extremity of one spring engaging with the upper extremity of an adjacent spring, the lower extremities of said springs having a double engagement with each of the two rods forming the point of intersection to which said spring is attached, substantially as 80 set forth.

6. The combination of a woven-wire mattress, the strands of which extend transversely 85 of the bed, a metallic supporting-frame composed of a series of rods circular in cross-section and extending transversely and longitudinally of the bed, the rods being crimped at their points of intersection, and a series of 90 spiral springs, each of said springs located at one of said intersecting points, the upper extremity of each of said springs being interwoven in the meshes of said mattress longitudinally of the bed, the lower extremity of 95 each of said springs having an encircling and a secondary bearing on each of the two rods, forming an intersection of said supporting-frame, substantially as set forth.

In testimony that I claim the foregoing to 100 be my invention I have hereunto set my hand this 28th day of February, A. D. 1888.

DANIEL H. GAIL.

Witnesses:

LULU WARREN,
J. B. FAY.