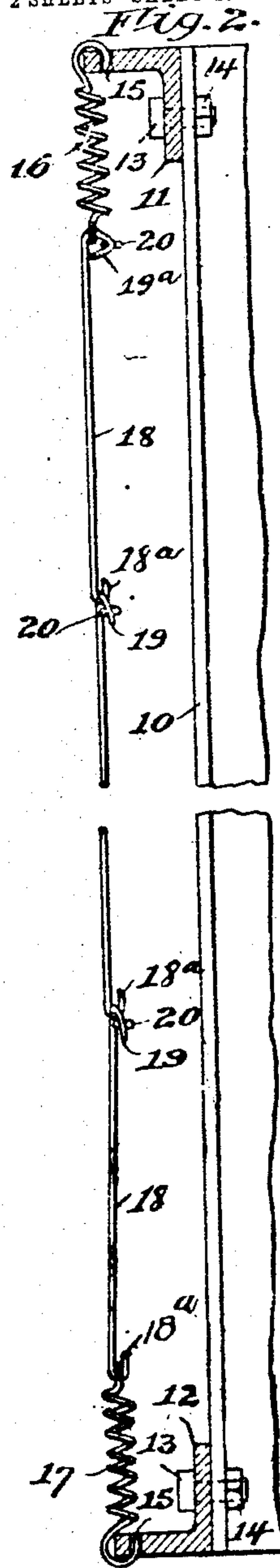
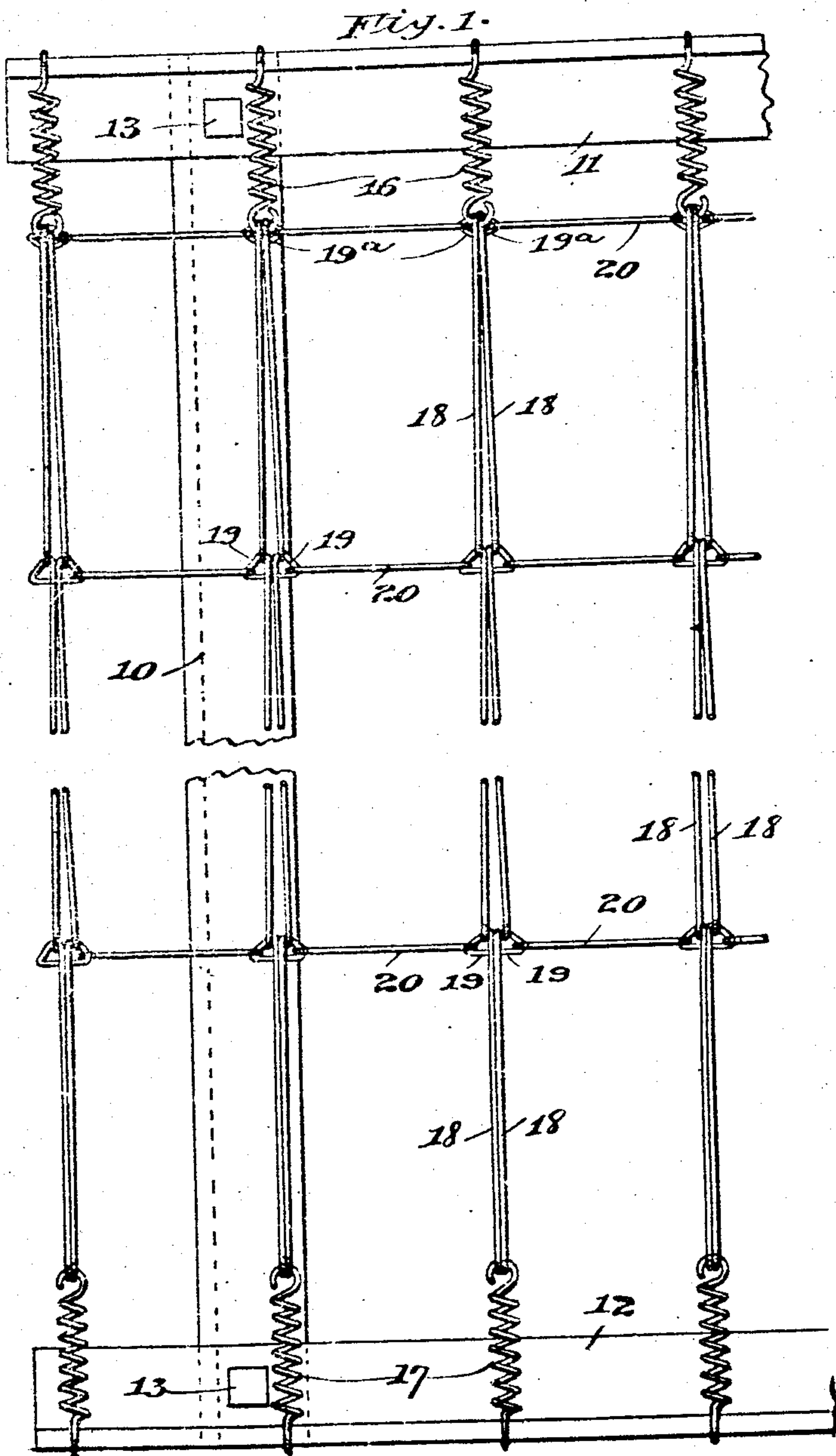


No. 865,799.

PATENTED SEPT. 10, 1907.

H. RICHARDSON.
WIRE BED BOTTOM FABRIC.
APPLICATION FILED FEB. 11, 1907.

2 SHEETS—SHEET 1.



Witnesses,
J. S. Mann,
S. N. Trud

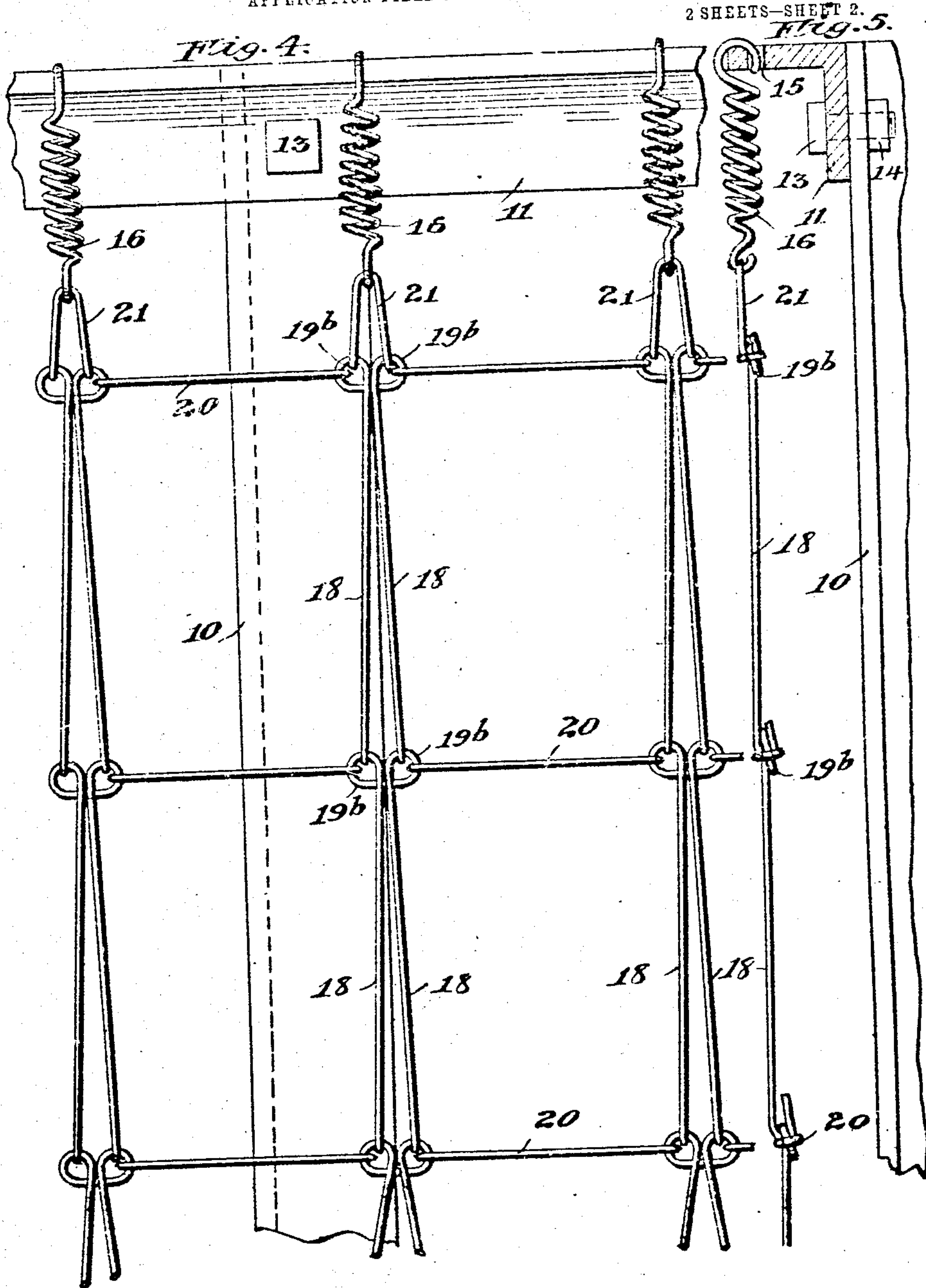
Fig. 3. *19a*
18-18
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HENRY RICHARDSON, OF CHICAGO, ILLINOIS.

WIRE BED-BOTTOM FABRIC.

No. 865,799.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed February 11, 1907. Serial No. 356,775.

To all whom it may concern:

Be it known that I, HENRY RICHARDSON, a subject of the King of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wire Bed-Bottom Fabrics, of which the following is a specification.

This invention relates to wire fabrics, and more particularly that class of fabrics employed for the bottoms of beds, couches, and the like. In such fabrics the tension or strain imposed thereon is principally in a direction longitudinally of the fabric; and hence it is desirable to so construct a fabric as to well adapt it to resist and withstand such longitudinal strains without undue sagging or bowing.

Many fabrics of this character and for this purpose have heretofore been proposed, which are made up of a plurality of bent wire units connected and arranged in various ways. In many cases the units are so connected as not to avoid what is known as diagonal tension, which produces an undesirable contraction or inward bowing of the longitudinal edges of the fabric. In other forms it has been attempted to eliminate this objection by arranging the units in straight parallel longitudinal strands, and connecting them laterally by links which serve to fill the spaces between the strands and maintain the strands in substantial parallelism.

In the earlier and older art of bent-wire bed-bottom fabrics it was common to employ a considerable number and variety of forms of units in the make-up of a single pattern of fabric. In more recent practice, where the units are machine-made, considerations of economy in manufacture have brought about a style of fabric wherein the units are substantially identical and uniform throughout the entire fabric, such units being either directly engaged with each other or connected by short links or clips.

The present invention is of the latter type; and among the principal objects and advantages sought to be attained thereby may be mentioned, - to produce a flexible and foldable fabric which shall preserve the form or contour of its constituent elements or units and insure the retention of their proper relative positions in the fabric, and particularly of the cross links which connect adjacent longitudinal strands, under all conditions of handling or service; to obtain a combination of great tensional strength with lightness of weight, which is secured through the use of units having two-ply or twin-wire tension members which divide the longitudinal strains equally between them, and which twin-wire tension members have individual end connections at each end with longitudinally adjacent units; to provide a structure permitting independent freedom of longitudinal movement of the individual longitudinal strands of the fabric in service without displacement of the transverse connections between such

strands; to produce a fabric that may be easily and economically assembled; and, generally, to attain a stronger and more perfect fabric of this type than has heretofore been produced.

My invention will be readily understood when considered in connection with the accompanying drawings, illustrating a preferred embodiment of my invention, in which, -

Figure 1 is a plan view of a portion of a bed-bottom frame and fabric, the latter being broken out intermediate its ends; Fig. 2 is an edge view of Fig. 1, with the end bars of the frame shown in cross-section; Fig. 3 is a fragmentary perspective view of the upper end portion of a bent-wire unit specially adapted for direct engagement with an end helical; and Figs. 4 and 5 are fragmentary plan and edge views, respectively, of a slightly modified form of fabric including V-shaped links between one end of the fabric and the end helicals.

Referring to the drawing, 10 may designate one of the longitudinal bars of the bed frame, and 11 and 12 the end or cross-bars, which bars are conveniently and cheaply formed of angle-bars and secured by bolts 13 and nuts 14. The cross-bars 11 and 12 may have their upstanding flanges apertured, as shown at 15 for the reception of the end hooks of the usual series of helical springs 16 and 17 through which the upper and lower ends of the fabric are commonly united with the upper and lower cross-bars of the frame, to furnish the desired resiliency and elasticity.

Referring now to the fabric itself, in which the novel features of the present invention more particularly reside, this fabric is made up of a series of parallel longitudinal strands each formed of duplicate or substantially duplicate bent-wire units connected end to end, in association with space-filling and connecting members that laterally and flexibly unite adjacent strands at intervals.

Referring first to the invention as illustrated in Figs. 1, 2 and 3, and describing the form and construction of the individual units of the fabric, it will be seen that these are each made from a single length of wire of suitable gage, according to the load to be sustained, which wire is bent double at its longitudinal center to form a straight longitudinal tension member of double or two-ply wire constituting the body of the unit, the twin wires of this unit being designated by 18, and each terminating at the lower end of the unit in hooks 18*. The central portion of the wire from which the twin wires of the tension member extend is so bent and disposed as to provide on the opposite sides of the upper end of the tension member small loops 19 herein shown as of triangular form, the inner adjacent sides of said loops being constituted by the extreme end portions of the twin wires of the tension member, and the lower sides of the loops being connected across and beneath said tension member. The units thus formed

are connected up in a series of straight parallel longitudinal strands by simply engaging the hooks at the lower ends of the units of one transverse row with the loops forming the heads of the units of the next underlying transverse row; the helicals 17 at the lower end being engaged with the twin hooks at the lower ends of the lower row of units, and the helicals 16 at the upper end being preferably hooked between the upper end of the tension members and the backwardly bent portion of the wire forming the twin loops, so that the helical engages both wires of the tension member and exerts an equal strain on each. Where the helicals at the upper end are thus directly engaged with the units, interhooked engagement of the helicals may be facilitated by bending the two loops 19^a (Fig. 3) downwardly on an intermediate line substantially parallel with the longitudinal axis of the tension member. The longitudinal strands thus formed and connected to the end bars of the frame are connected transversely preferably by means of simple straight wire links 20 having hooked ends which engage the adjacent loops 19 and 19^a of laterally adjacent units. These links serve to flexibly connect the longitudinal strands and also constitute space-filling and auxiliary supporting members for the mattress.

In the form of the invention illustrated in Figs. 4 and 5, the same principle of construction is applied; the said figures simply showing a variation in the form of the loops constituting the heads of the units, the loops 19^b herein shown being approximately circular; and the loops of the upper transverse row being connected to the end helicals by V-shaped links 21, which are directly interhooked at their open ends with the loops 19^b of the units, and at their closed ends are engaged by the hooks of the helicals.

In the preferred form of unit herein shown, the twin wires of the two-ply tension member are preferably disposed contiguous at their upper ends, and the manner of engagement of the units spreads the said members somewhat at their lower ends, as shown (except in the case of the lower transverse row), thus giving to the body of the unit a tapered form narrowest at its upper end where it lies between the laterally projecting loops, and widest at its lower end where it interhooks with the loops of the next longitudinally adjacent unit.

From the foregoing description and illustration it will be observed that each longitudinal series of double-wire units forming the longitudinal strands of the fabric lies in a single independent direct line of strain from end to end of the structure. It has its individual spring connection with the cross-bar at each end and a flexible connection with each of the similar series on either side of it. The spring connections of each series are disposed in axial alinement with the median line or axis of the strand, so that both of the wires comprising the body of each unit receive the same tension and divide the strain equally between them, and the flexibility of the transverse connections to the similar lines of units on either side allows the longitudinal freedom of each line. It is such a series of units or links which constitute each of the longitudinal strands referred to in the appended claims. It will also be observed that the described formation of the loops at the head of each unit is such as to prevent the displacement of the transverse connecting links, since both ends of said links are limited

by the dimensions of the loops in respect to possible movement longitudinally of the units. A further advantage inheres in the described formation of loops in that the twin wire tension members are thereby afforded individual end connections at each end with the longitudinally adjacent units, so that there is afforded a double thickness of wire, instead of a single thickness, at the interhooked connection between adjacent units, which greatly contributes to the tensional strength of the longitudinal strands. Furthermore, by reason of the fact that the longitudinal tension is opposed by and tends to draw the twin wires of the tension members together, while the lateral tension created by the loads sustained by the transverse links 20 is opposed by the lower substantially straight transverse connection between the two loops, all tendency to contract the loops or to distort or deform the individual units under either the strains imposed by the end helicals or by the load imposed upon the fabric, is neutralized, and the loops remain rigid and the fabric will preserve its proper form under all conditions.

From the foregoing it will be observed that the described structure forms a fabric that, while flexible and foldable both longitudinally and transversely, is nevertheless in service substantially rigid in its resistance to both longitudinal and transverse tensional strains; practically all of the resiliency and elasticity being afforded by the end helicals, which greatly reduces the local stretching and sagging effects that have hitherto characterized this type of bed-bottom.

The described fabric can be cheaply and easily made, as it is possible to both bend the units to shape and run them out in continuous chain form in a single machine, making it necessary only to supply and connect up the helicals and the transverse connecting links in the manual assembling of the fabric.

I claim:

1. A bed-bottom fabric including a plurality of bent wire units connected end to end to form parallel longitudinal strands each lying in a single direct line of strain from end to end of the structure, each of said units consisting of a wire bent to form a straight longitudinal two-ply tension member having a pair of loops at one end thereof, said loops being connected across said tension member, in combination with transversely disposed links engaging the loops of laterally adjacent strands, substantially as described. 105
2. A bed-bottom fabric including a plurality of bent wire units connected end to end to form parallel longitudinal strands each lying in a single direct line of strain from end to end of the structure, each of said units consisting of a wire bent to form a tapered two-ply longitudinal tension member having a pair of loops at its narrow end, connected across said tension member, in combination with transversely disposed links engaging the loops of laterally adjacent strands, substantially as described. 110
3. A bed-bottom fabric including a plurality of bent wire units connected end to end to form parallel longitudinal strands each lying in a single direct line of strain from end to end of the fabric, each of said units consisting of a wire bent to form a tapered two-ply longitudinal tension member having a pair of loops at its narrow end connected across said tension member, and a pair of hooks at its wide end engaged with the loops of a longitudinally adjacent unit, in combination with transversely disposed links hooked into the loops of laterally adjacent strands, substantially as described. 115
4. As an article of manufacture, an integral bent wire unit for a bed-bottom fabric consisting of a straight double-wire longitudinal tension member the twin wires of which terminate at one end in hooks and at the other 120

end are extended to form a pair of oppositely disposed loops lying wholly laterally of and connected across said tension member, substantially as described.

- 5 As an article of manufacture, an integral bent wire unit for a bed-bottom fabric consisting of a tapered double-wire longitudinal tension member the twin wires of which terminate at the wide end in hooks and at the narrow end lie contiguous to each other and are extended to form a pair of oppositely disposed loops lying laterally of and connected across and beneath said tension member, substantially as described.
- 10

6. A bed-bottom fabric including a plurality of bent wire units connected end to end to form parallel longitudinal

strands, each of said units consisting of a wire bent to form a straight double-wire longitudinal tension member 15 having a pair of laterally projecting loops at one end, said loops being connected across one side of said double-wire tension member, in combination with transverse links engaging the loops of laterally adjacent units to thereby flexibly connect adjacent strands, substantially as de- 20 scribed.

HENRY RICHARDSON.

Witnesses:

SAMUEL N. POND,
FREDERICK C. GOODWIN.