

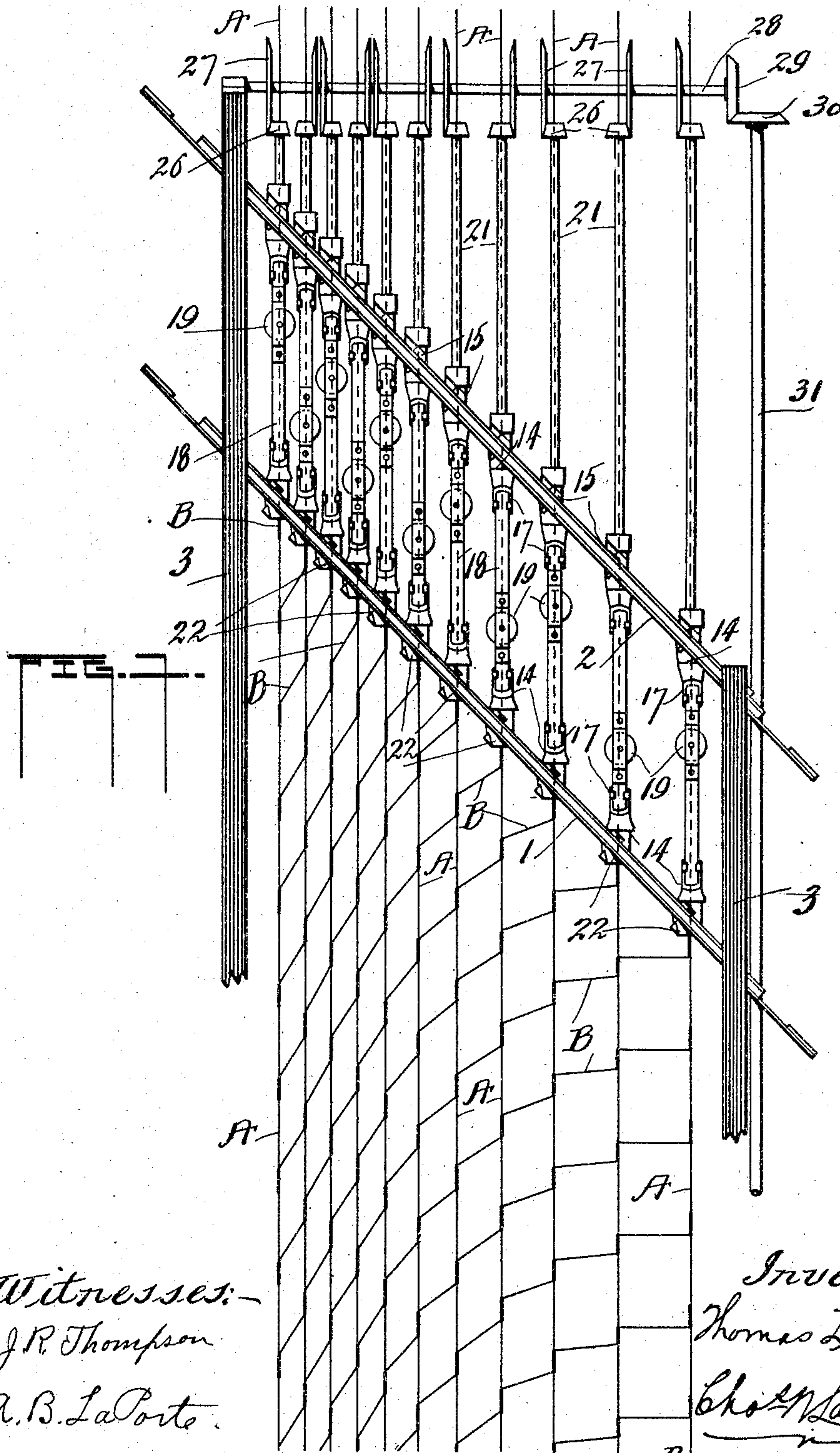
No. 790,213.

PATENTED MAY 16, 1905.

T. LITWILLER.
METHOD OF MAKING WIRE FENCING.

APPLICATION FILED APR. 20, 1904.

2 SHEETS—SHEET 1.



Witnesses:
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A. B. LaPorte.

Inventor:
Thomas Litwiler
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By *[Signature]* Atty.

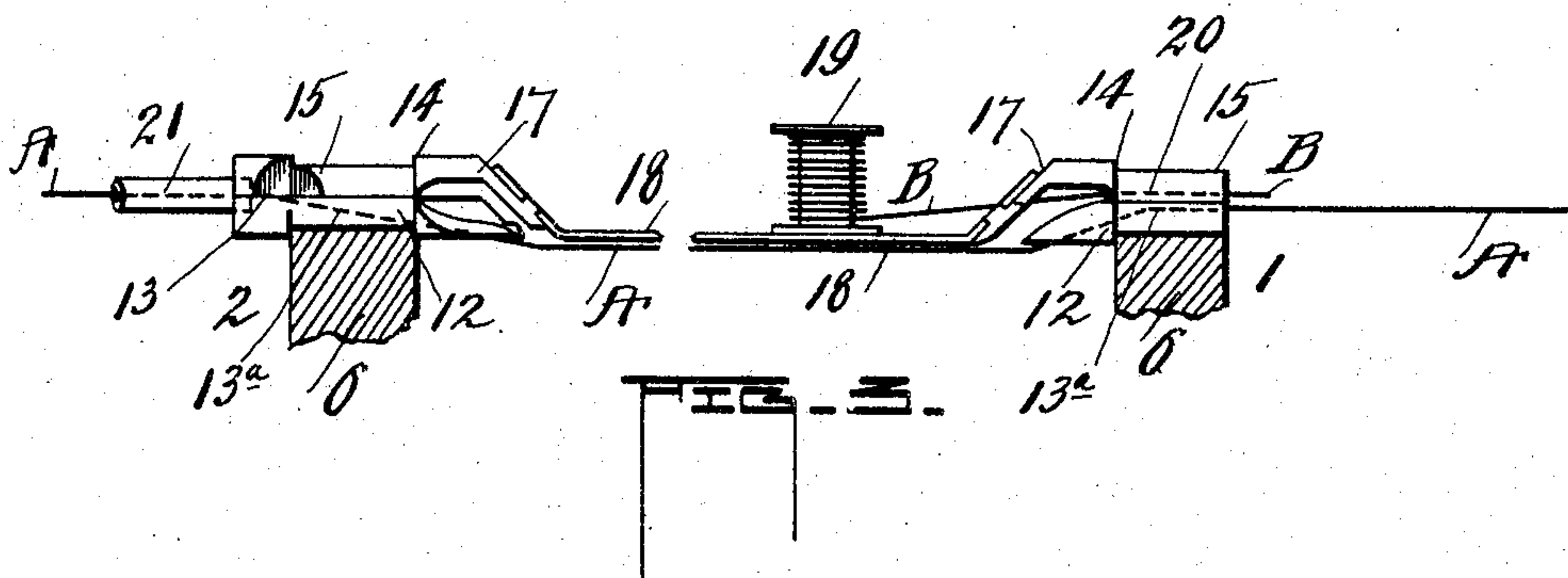
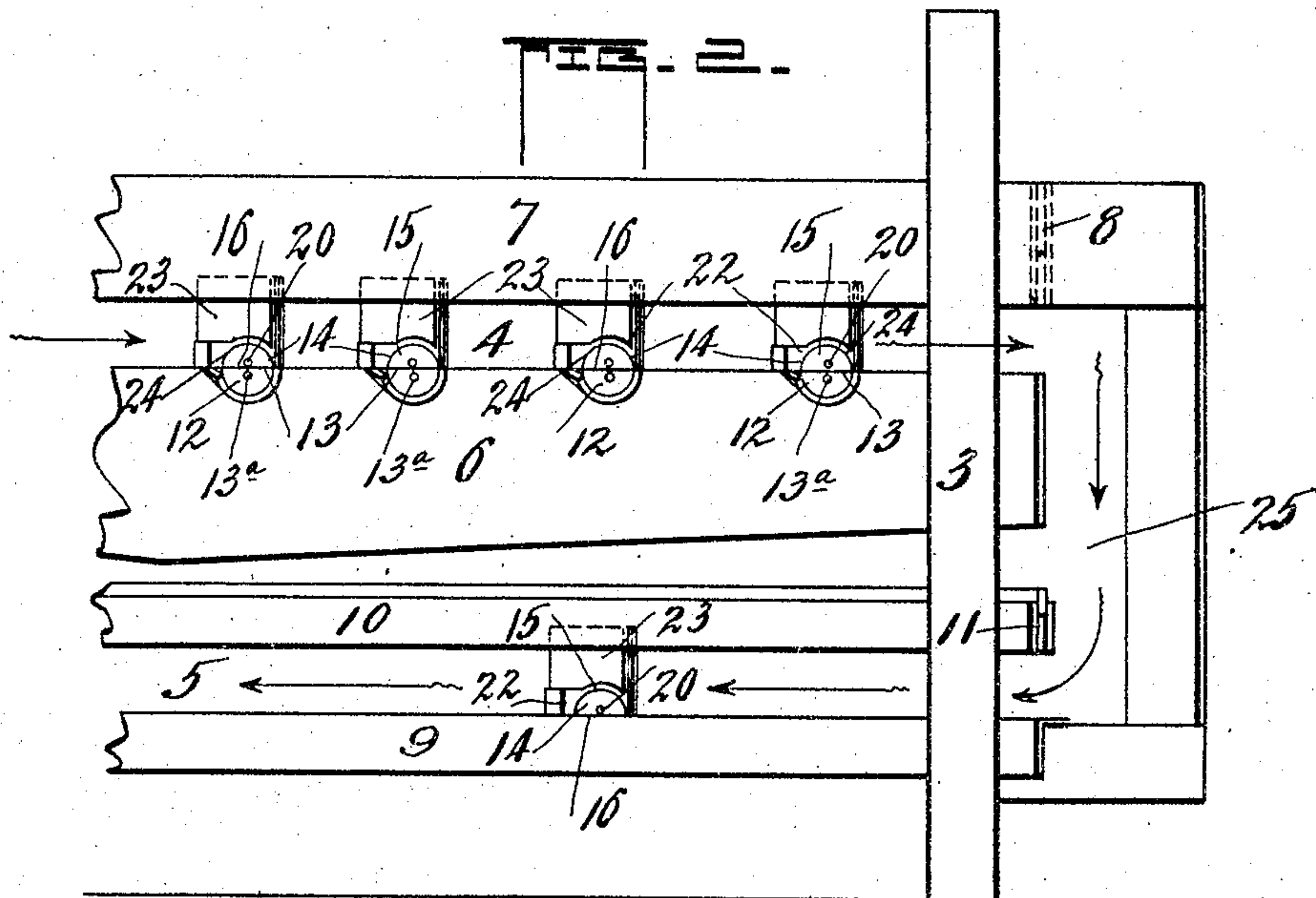
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UNITED STATES PATENT OFFICE.

THOMAS LITWILLER, OF TREMONT, ILLINOIS.

METHOD OF MAKING WIRE FENCING.

SPECIFICATION forming part of Letters Patent No. 790,213, dated May 16, 1905.

Application filed April 20, 1904. Serial No. 204,044.

To all whom it may concern:

Be it known that I, THOMAS LITWILLER, a citizen of the United States, residing at Tremont, in the county of Tazewell and State of Illinois, have invented certain new and useful Improvements in Methods of Making Wire Fence; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved method of weaving wire into a fabric or netting, more especially the method of weaving together wires to form wire fencing, this particular description of wire fencing being described and shown in an application for patent for wire fence filed by me November 15, 1902, Serial No. 131,491, renewed on November 9, 1903, and bearing Serial No. 180,396.

The object aimed at by me in the method which I employ is to produce a stay-wire fence wherein the stays have a diagonal or oblique bearing to the longitudinal or continuous strand-wires in the completed fence. The longitudinal strand-wires are fed or drawn continuously through a corresponding series of twisting sections which are disposed in a diagonal or oblique line, succeeding sections being disposed slightly in advance of the preceding sections. Coacting with the twisting sections through which the longitudinal strands are drawn are a series of movable stay-carrying sections or shuttles from which stay-wires are fed or drawn, which are intertwisted first with one of the outside longitudinal or selvage strands. The stay-carrying section or shuttle is then moved diagonally or obliquely in the direction of travel of the longitudinal wires, and with the intersection of each of the succeeding or adjoining longitudinal strands the stays are intertwisted and cut after being intertwisted with the opposite outside longitudinal or selvage wires, when the stay-carrying sections or shuttles will travel down and across the path of the fabric beneath the longitudinal wires up and into position to place another stay. The longitudinal wires are drawn out

continuously, and the stay-wires are pulling out continuously, and said stays are moved obliquely across and forwardly in the general direction of the movement of the longitudinal wires, producing a fabric wherein the stays bear diagonal to the longitudinal bearing of the strand-wires and appearing at an angle opposite to that in which the wires are fed.

I am aware of machines which aim to produce a continuously-woven fencing, also of the method in vogue in making stay-fences; but I am not aware of any method by which a wire fence is produced continuously in which the stays are placed diagonally across the strand-wires with which they are intertwisted.

Figure 1 is a plan view of a number of wire-twisting devices and shuttles assembled in proper relation to produce a continuous woven fencing and showing the same in course of construction. Fig. 2 shows, enlarged, a partial front elevation of parts seen in Fig. 1 and discloses the further mode of operating the machine. Fig. 3 is an enlarged detail, in side elevation, of the longitudinal strand-wire-feeding sections and the coacting stay-carrying sections or shuttles.

In the practice of my invention there is provided a bed-frame consisting of the uprights 1 and 2, which comprise the front and rear portion of the bed. The same are supported in the longitudinally-disposed frames 3 at opposite sides or ends of the bed. The uprights 1 and 2, which compose the bed-frame, are arranged parallel to each other and at suitable distance apart and extend between the frames 3 at an angle approximating forty-five degrees, more or less, the angle at which the uprights 1 and 2 are carried being governed solely by the angle at which it is desired to place the stays in the fence when completed.

The front and rear portions of the bed 1 and 2 are provided with runways or guides 4 and 5. The runway or guide 4 is composed of the base-plate 6 and the overlying head-plate 7, in which is arranged the groove or slot 8. The runway or guide 5 is composed of the base-plate 9 and the overlying head-plate 10, in which is arranged the groove or slot 11, simi-

lar in all respects to the slot 8 above. The disposition of the base and head plates form the runways or guides 4 and 5, as shown. The parts of the bed-frame comprising the up-
 5 rights 1 and 2 are duplicated, so the description of one set as above will suffice for both.

12 denotes the front and rear semicircular sections of the strand or longitudinal wire
 10 twisters, of which there is a series, the flat faces 13 of which lie uppermost and are jour-
 naled, as shown, in the base-plate 6 of the bed with their flat faces 13 in a line with the up-
 per face of the base-plate 6. The sections 12 are provided with wire-grooves, as indicated
 15 at 13^a, and, as was stated in the fore part of this specification, succeeding twisting sections are carried slightly in advance of its follow-
 ing sections, substantially as seen in Fig. 1.

There is provided, coöperating with the
 20 strand-wire twisters, a plurality of stay-wire carriers, twisters, or shuttles composed of the front and rear sections 14, having semicircular portions 15 corresponding to the forward
 portions of the sections 12 and having flat
 25 faces 16 adapted to coincide with the flat faces of the sections 12 in a manner and for a purpose to be described. The stay-carriers are further provided with the corresponding
 extensions 17, which are suitably beveled and
 30 to which the opposite ends of a strap or plate 18 is attached (see Figs. 1 and 3) for connect-
 ing the front and rear sections 14 together to make a common carrier, so that in the move-
 ment of one section its mate will be corre-
 35 spondingly moved, and on the strap or plate 18 is suitably carried a spool (designated as 19) carrying a wire coil from which is fed a
 stay-wire. The front sections 14 of the stay-
 carrier are provided with a wire-groove 20,
 40 and the stay-wire, which is indicated as B, is fed or drawn from the spool 19 and passed
 through the groove 20, as shown in Fig. 3, to be intertwisted with the several longitudinal
 wires (denoted as A.) The wires A are fed or
 45 drawn from a suitable supply (not shown) and passed through a shaft or spindle 21, attached
 to the rear sections 12, and through the groove 13^a of the rear section 12 down, along, and
 beneath the strap or plate 18 and up and out
 50 through the groove 13^a of the front section 12 and, coinciding with the stay-sections B, are
 intertwisted therewith during the continued pulling out of such longitudinal or strand
 wires A.

55 The front and rear sections 14 of the spool-carriers or stay-shuttles are each provided with a cap-plate 22, having the vertically-ex-
 tended portions 23, which bear at an angle to correspond to the angle at which the head-
 60 plates 7 and 10 are carried, while the twister-sections and shuttles lie parallel with each other and with the longitudinally-disposed frames 3. The cap-plates are provided with
 semicircular faces 24 and form one-half of a

bearing for the sections 12 and 14, the other 65
 half-section of the bearing being in the base-plate 6, and said extended portions 23 are
 movable in the grooves 8 and 11 of the plates 7 and 10 for a purpose to be described and to
 retain the parts in their correlative positions 70
 when the feeding of the stay-sections are co-incident with the strand-wires.

The strand-wire-twister sections have fixed positions in the bed - frame and are here shown at graduated distances, which is for the 75
 purpose of producing a fence having gradu-ated meshes. However, the spacing of the
 strand-wire-twister sections may be uniform, if desired. The strand-wire-twister sections
 will be in number to correspond to the num- 80
 ber of strand-wires or as many as may be needed for making a fence fabric of a desired
 width. In this instance the fence is known as "eleven-bar" fence. Therefore there would
 be needed eleven sets of strand-wire-twister 85
 sections; but this is not the case with the stay carriers or shuttles, as to facilitate in the
 perfect operation of the machine and to pro-duce a fabric continuously I would provide
 a great number of stay-carrying sections, the 90
 object of which will become apparent.

In producing the fabric the strand-wires A would be passed through their twister-car-
 rying sections in the manner specified and the stay-carrying shuttles would be successively 95
 and intermittingly brought coincident with each succeeding stay-carrying section through-
 out the bed. In other words, every shuttle carrying a stay-wire would start in (see Fig. 1) at the left-hand side of the bed, and its stay 100
 would be intertwisted with the outside selvage-wire. During such intertwisting of the stay
 with the selvage wire the selvage-wire is being continuously drawn forward, which will
 also pull out continuously the stay-wire. After 105
 a sufficient number of turns have been made in twisting the wires the stay-carrying shut-
 tle is shifted sidewise diagonally or moved forwardly obliquely to cause said stay-carry-
 ing shuttle to coincide with the second longi- 110
 tudinal wire and would remain for a prede-termined period in such a position until the
 stay-wire had been intertwisted with said lon-
 gitudinal wire. After a complete twist was
 made the said stay-carrying shuttle would 115
 move in the bed in like manner as before and continue to be so moved intermittingly for
 causing the same to coincide with all of the succeeding strand-wires and to be twisted
 therewith. After said stay-wire had been 120
 intertwisted with the opposite and outside selvage-wire to the right side of the bed
 the stay-wire will be severed, and the said shuttle will move forward in the direction of
 the arrows shown in Fig. 2, and the said stay- 125
 carrying shuttle, with its cap-plates 22, would enter the vertically-disposed way 25, where
 suitable mechanism would receive the same,

lower it to the runway 5, and the same would enter said runway and return across the bed in the manner indicated by the arrows in Fig. 2, in which a stay-carrying shuttle and cap-plate is in the act of moving along the runway 5. At the opposite end of the bed said stay-carrying shuttles would enter a vertically-disposed way similar to that shown, as at 25, and suitable mechanism would raise it to the position already previously described, which is preliminary to starting said stay-carrying shuttle along the runway 4 for the purpose of placing another stay and causing the same to be intertwisted with each of these succeeding strand-wires. The reason for a great number of stay-carrying shuttles will now become evident, for it will be understood that they follow each other in succession, so that, as appears in Fig. 1, there will always be a stay-carrying shuttle coincident with each of the strand-wire-twisting sections, and when one shuttle is moved all of the shuttles will be moved, and it is immaterial as to the number of shuttles moving along the runway 5; but only a specified number may be in the runway 4 at any one time.

It will be observed from the angle at which the bed-frame is carried, also the disposition of the twisters, that by a continuous pulling-out process of the strand-wires and the stays, a stay when finished will have its lower end or starting-point in advance of the end of the complete stay or in a line bearing obliquely across the fabric, as shown by the completed stays and those which are forming in Fig. 1.

On the rear end of each of the spindles or shafts 21 is carried a pinion 26, which meshes with a bevel-gear 27, carried on the shaft 28. The shaft 28 is adapted to be actuated through the miter-gears 29 and 30, the former carried by the shaft 28 and the latter carried by a longitudinally-disposed shaft 31, which is adapted to be actuated from some suitable source of power which has combined therewith reversing mechanism for the purpose of intermittently reversing the rotation of the shafts 31 and 28 or at each alternate twisting of the stay-wires with the strand. It will be noticed that adjacent bevel-gears 27 are adapted to rotate in opposite directions for the purpose of imparting a reverse motion to each alternate shuttle and strand-wire-twister section, which movement is also reversed with the reversal of the shafts 31 and 28, the purpose of which is to produce a fabric substantially like that in the application above referred to, in which the stays are intertwisted alternately over and under both across the fabric and longitudinally thereof. It also enables the carrying of the strand-wire-twister sections and stay-shuttles, as shown in the drawings, and the disposition of the spools 19, upon which are carried the stays, is such that

the shuttles may be rotated simultaneously and without interference.

There is no means shown on the machine for gripping the free end of the stays as they are caused to make their initial twist with the left-hand selvage-wire, nor is there any means shown for shifting the stay-carrying shuttles, for it will be understood that the mechanism for doing this particular work and for carrying the shuttles to and along the runway 5 are properly within the province of the designer or mechanic and could be carried out in several ways. It is to be also understood that while I have specified that the spindles 21 rotate in opposite directions, this need not be carried out unless desirable, and the movements of the twisters may be varied and yet come within the scope of the present invention.

In following out the invention attention is called to different forms of diagonal stays. One such, as disclosed in the drawings, where the completed stay, although fed from shuttles adapted to travel in a straight diagonal line, is directed or bears obliquely across the strand-wires in a curved line, occasioned by the use of a graduated mesh from top to bottom of the fabric. In the other form (not shown on the drawings, but referred to) a uniform mesh throughout would be produced by passing the stay-carrying shuttles across the strand-wires in the manner shown, but move each shuttle after a stay had been drawn from the shuttle a length corresponding to the width, height, or space between the strand-wires, when the diagonal bearing of the stays would be in a straight line rather than curved, as shown in the figures. It is understood that although the shuttles move intermittently across the bed the stay-wires, like the strands, are drawn or pulled out continuously.

Having thus fully described my invention, what I claim is—

1. The method of making wire fence consisting of the following steps: continuously feeding a series of strand-wires; feeding continuously stay-wires diagonally across the path of the strands and intertwisting the said stays with each succeeding strand-wire, forming stays bearing diagonally across the strands from selvage to selvage, substantially as specified.

2. The method of making wire fence consisting of the following steps: continuously feeding a series of strand-wires; feeding continuously stay-wires diagonally across the path of the strands and intertwisting the said stays with each succeeding strand-wire, forming stays with arcs between their ends bearing diagonally from selvage to selvage, substantially as specified.

3. The method of making wire fence consisting of the following steps: continuously feeding a series of strand-wires, feeding stay-

wires diagonally across the body of the strands,
continuously pulling out the stay-wires, and
intertwisting the same with each succeeding
strand-wire to form a stay bearing diagonally
5 across the strands at an angle opposite to the
angle of feed of the stay-wires, substantially
as specified.

In testimony whereof I affix my signature in
presence of two witnesses.

THOMAS LITWILLER.

Witnesses:

CHAS. W. LA PORTE,
ROBERT N. McCORMICK.