

1,003,355.

Patented Sept. 12, 1911.

Fig. 4.

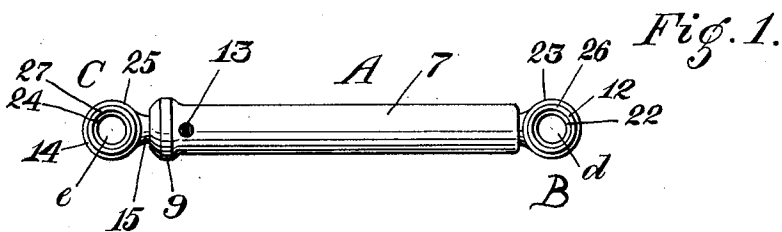
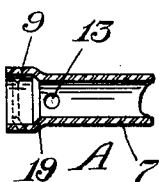


Fig. 3.

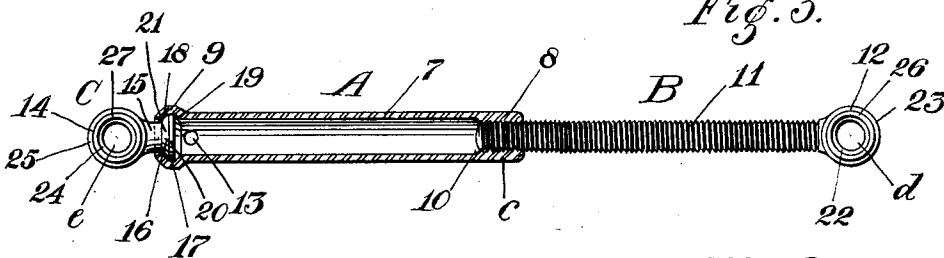


Fig. 2

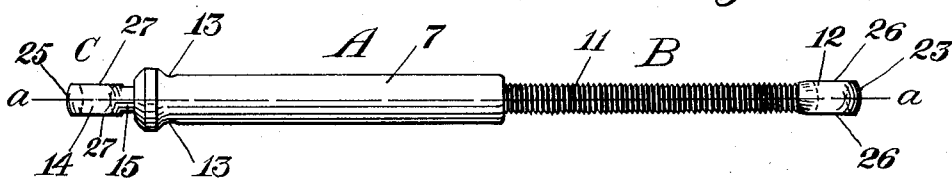


Fig. 6

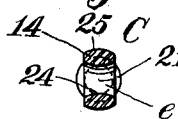
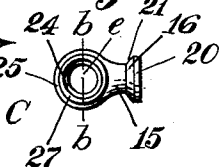


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

BUEL H. GREEN, OF LOS ANGELES, CALIFORNIA.

TURNBUCKLE.

1,003,355.

Specification of Letters Patent.

Patented Sept. 12, 1911.

Application filed June 29, 1910. Serial No. 569,582.

To all whom it may concern:

Be it known that I, BUEL H. GREEN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Turnbuckles, of which the following is a specification.

This invention relates to turn-buckles, and it has for its object to provide improvements in turn-buckles which will be superior in point of positiveness of operation, simplicity and relative inexpensiveness of construction in combination with efficiency in service, durability, serviceability, and general adaptability to varying conditions of use and service.

With the above and other objects in view, the invention consists in the novel provision, formation, construction, combination, association and relative arrangement of parts, members and features, all as hereinafter described, shown in the drawing and finally pointed out in claims.

In the drawing:—Figure 1 is a longitudinal side view of a turn-buckle constructed and organized according to the invention; Fig. 2 is a similar view with the parts in positions resultant upon relative adjustment thereof, and the line of vision being at an angle of ninety degrees to that of the showing in Fig. 1; Fig. 3 is a longitudinal sectional view, partly in full lines, taken upon the line *a—*a**, Fig. 2; Fig. 4 is a detail sectional fragmentary view, prior to final formation of parts thereof; Fig. 5 is a detail fragmentary view of a portion of the construction shown in Fig. 3, and in detached position; and, Fig. 6 is a vertical transverse sectional view, taken upon the line *b—*b**, Fig. 5, and looking in the direction of the appended arrow.

Corresponding parts in all the figures are denoted by the same reference characters.

Referring with particularity to the drawing, the improved turn-buckle shown therein as embodying the invention comprises three relatively adjustable members, A, B and C, the members A and C being swivelly connected, and the members A and B having each a threaded connection with the other; the member A being tubular in form and adapted for the reception and accommodation of the major portion of the member B, upon relative adjustment of said members A and B. The threaded connection between the members A and B is designated at *c*.

Each of the members B and C is provided with or formed with an eye, *d* and *e*, respectively, the office of each of which is to enable connection with the respective member of the wire, cord, rope, rod, or other connection or structural element to which the turn-buckle is to be applied, and upon which stress is to be imposed in the performance of the turn-buckle function.

The member A comprises an annular or tubular elongated body 7, within which, at one end, as at 8, are cut internal threads; the other end of said body 7 being formed into an enlarged housing 9 for the reception of a portion of the member C, in the manner hereinafter described. The tubular body 7 is undercut longitudinally between the housing 9 and the end portion threaded, as at 8, as indicated at 10 in Fig. 3; so that the internal diameter of the tubular body is enlarged relative to the end portion thereof having the threads 8, for the purposes hereinafter specified.

The member B comprises a threaded shank 11 formed to coact with the threads at 8 at the end of the tubular body 7, having at one end a head 12; the shank 11 being of such longitudinal dimension as to permit of substantially its entire reception and housing by the tubular body 7, exclusive of the housing 9. The tubular body 7 is transversely pierced to provide opposed holes or openings 13 formed closely adjacent to the housing 9 at one end of the body 7, the purposes of which will be hereinafter specified.

The member C comprises a head 14 joined by a short neck 15 with a swivel element 16 which is received by the housing 9 which so accommodates the same as to permit rotation of the swivel element 16 within said housing, qualified by slight play or loose motion between the swivel element and the housing. To form the housing 9, the material of which the tubular body 7 is formed is spun into final formation through a process inclusive of the intermediate step indicated in Fig. 4; and the resultant housing is so conformed as to include an annular relatively narrow internal surface portion 17 merging into a radiused internal surface portion 18 extending to the outer end portion of said housing; said annular internal surface portion 17 merging in the opposite direction into a countersunk portion 19 between which and the annular portion 17 exists an annular sharply defined angularity. The swivel ele-

ment 16 is so formed as to provide an annular end portion 20 fitting loosely within the annular internal surface portion 17; and merging into a radiused portion 21 complementing the radiused internal surface portion 18 of the housing 9 and loosely fitting within the same.

The head 12 is bored transversely to produce the eye *d*, such eye being confined by annular radiused walls 22; and the head 12 having likewise an outer annular radiused surface portion 23. The head 14 is likewise bored transversely to produce the eye *e*, which latter is confined by annular radiused walls 24; the outer surface portion of the head 14 being likewise annularly radiused, as at 25. The lateral faces 26 of the head 12 are finished flat, and lie in parallel planes, at right angles to the axis of the bore of the eye *d*. The lateral faces 27 of the head 14 are likewise finished flat, and extend in parallel planes at right angles to the axis of the bore of the eye *e*.

The members A and B are manipulated to produce relative axial rotation thereof, resultant upon which the total length of the two members, as well as of the three members A, B and C, is varied, in the performance of the function of the turn-buckle in uniting under tension or stress the wires, cables, rods, or other devices, parts or elements respectively connected with the members B and C and the heads 12 and 14 thereof. Such devices or elements are passed through the eyes *d* and *e*, and, in the case of wires, cords and other flexible devices are twisted structurally to secure the same in connection with the turn-buckle. The radiused formations at 22 and 23 of the head 12, and at 24 and 25 of the head 14, receive and hold wires or other devices or elements connected with the respective heads positively without subjecting the same to excessive abrasion. This positiveness of holding action is supplemented by the flat faces 26 of the head 12 and 27 of the head 14, across which the wires or other devices or elements extend in angular deflection from the said radiused surface portions. The radiused formations referred to of the heads 12 and 14 likewise materially reinforce and strengthen said heads.

The co-engaging annular surface portions 17 and 20, respectively, of the housing 9 and the swivel element 16, and the correspondingly co-engaging radiused surface portions 18 and 21 of the housing 9 and the swivel element 16, respectively, insure a positive and effective co-engagement of the swivel element with the housing thereof. The annular angularity between the annular surface portion 17 within the housing 9 and the countersunk formation 19 likewise within the housing 9, is productive of an annular bearing surface between the swivel element and the housing, in opposition to the radiused

bearing surface 18 with which co-engages the radiused portion 21 of the swivel element. The slight play allowed the swivel element within its housing will result, in use of the turn-buckle, in the abrasive action of the swivel element upon the inner surface of the housing 9, at the bearings aforesaid, to thoroughly clean the co-engaging surface portions of the swivel element and its housing, and keep the same bright and free from rust.

It results from the predetermination of the length of the threaded shank 11 of the member B, and the length of the tubular body 7 exclusive of the housing 9, and further from the formation of the opposed holes or openings 13 at the end of the tubular body 7 closely adjacent to the housing 9, that when the member B is screwed entirely home within the member A, such openings 13 are internally stopped. The function of said openings is their adaptability to receive a manipulating implement for relative adjustment of the members A and B, and likewise to receive a tie-wire or other lock extending from the member C and preventive of relative axial rotation of the member A and the member C. When the member B is screwed entirely home within the member A, as above stated, such manipulating implement cannot be passed through the registering openings 13, or through either of the same into the tubular body 7; nor can such tie-wire or other locking device be passed into or through the said body 7. Therefore, in the first case, the appearance of the inner end of the shank 11 in registration with the openings 13, is notice to the user of the turn-buckle that its further employment to tighten and draw together the devices or elements with which the heads 12 and 14 are connected cannot be performed without first elongating the entire turn-buckle formation, by unscrewing the member B partially from the member A, then re-adjusting the connection of the turn-buckle with the wires or other devices between which it is interposed, and then screwing the member B farther into the member A. In the second case, such appearance of the member B in registration with the openings 13, is notice to the user of the turn-buckle that it may be possible to impose further stress upon the devices or elements connected thereto, in the manner aforesaid, prior to locking the members C and A against relative axial adjustment, preventive of relative axial adjustment, in ordinary service, of the members A and B.

The variation of internal diameter of the member A, as between the end portion thereof threaded at 8 and the major portion thereof, prevents binding of the threaded shank 11 within the tubular body 7 of the member A, should the true straight longitudinal formation of either the shank 11 or

the body 7 be altered or varied, as by buckling thereof.

The entire device is rigid and durable in the construction of its separate parts and features, convenient of manipulation, adaptable to a wide range of working conditions, and particularly to the working conditions present in flying machine practice, in which the proper taut condition of stay-wires, braces, and similar elements is of the utmost importance to safety of the operator and maintenance of working conditions.

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

1. A turn-buckle comprising an outer tubular member provided adjacent to one end portion with a transverse opening, an inner member having a threaded connection with the end of said tubular member opposite to that at which said opening is formed, and an attachment head connected with the tubular member; said opening being intermediate of the threaded end of the tubular member and the attachment head.

2. A turn-buckle comprising an outer tubular member provided adjacent to one end portion with a transverse opening, an inner member having a threaded connection with the end of said tubular member opposite to that at which said opening is formed; said inner member being of such longitudinal dimension as to stop said transverse opening in said tubular member at one end and to project at the other end from the other end of said tubular member, and an attachment head connected with the tubular member at the end thereof in which said opening is formed.

3. A turn-buckle comprising an outer tubular member provided at one end with internal threads and at the other end with a transverse opening; an inner threaded member co-acting with the internal threads of said outer tubular member and of such longitudinal dimension as to stop said transverse opening at one end and to project at the other end from the other end of said outer tubular member; and an attachment head connected with the second-named end of the tubular member.

4. A turn-buckle comprising an outer tubular member provided at one end with internal threads and at the other end with a transverse opening; an inner threaded member co-acting with the internal threads of

said outer tubular member and of such longitudinal dimension as to stop said transverse opening at one end and to project at the other end from the other end of said outer tubular member; said inner member being provided at one end with an attachment eye; and an attachment head connected with the second-named end of the tubular member.

5. In a turn-buckle, an attachment head having a transverse eye confined by annular radiused walls and having an annular radiused external surface portion; said attachment head being formed with opposed lateral flat faces lying in planes at right angles to the axis of said eye and between the radiused parts.

6. In a turn-buckle, an attachment head, a swivel element connected therewith, and a tubular body one end of which is formed over the swivel element and provided with internal spaced surface portions one of which is radiused and the other of which is of counter-sunk formation; said swivel element being provided with an annular surface portion disposed between the said internal surface portions of the tubular body, and with a radiused portion disposed for co-engagement with the radiused internal surface portion of said spun tubular body.

7. A turn-buckle comprising a tubular body provided at one end with a housing, and with a transverse opening adjacent to the housing, an attachment head provided with a swivel element rotatably inclosed by the housing, the tubular body being provided at the end opposite to that of the housing with internal threads and having an internal diameter throughout the major portion thereof enlarged with respect to the internal diameter at the threaded end thereof, and a threaded shank co-engaging with the threaded end portion of the tubular body and having at one end an attachment head; said threaded shank being of such longitudinal dimension as to stop the transverse opening in the tubular body when screwed home in the latter.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

BUEL H. GREEN.

Witnesses:

RAYMOND I. BLAKESLEE,
B. F. FLETCHER.