

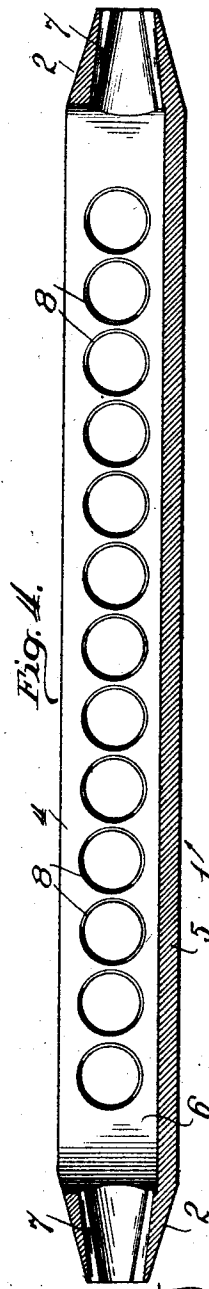
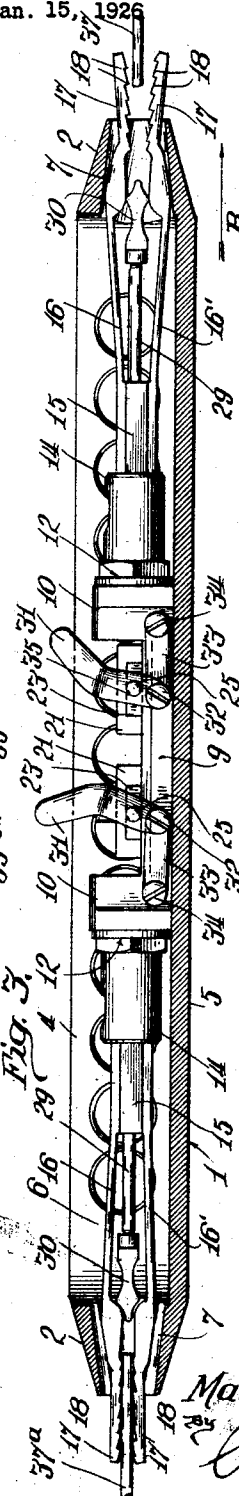
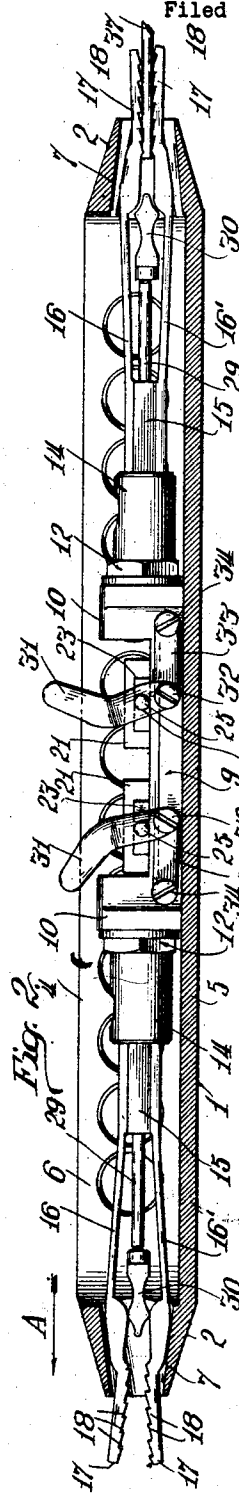
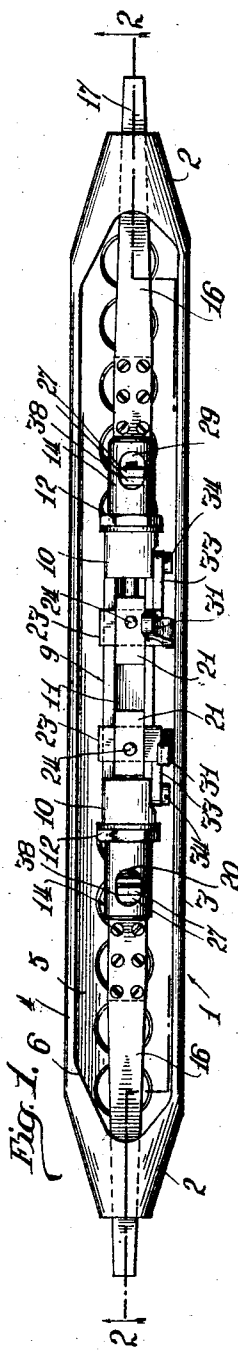
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THROWN PINCH SHUTTLE

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THROWN PINCH SHUTTLE.

Application filed January 15, 1926. Serial No. 81,524.

This invention relates to improvements in thrown pinch shuttles and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The main object of the invention is to provide a duplex pinch shuttle adapted to be thrown or reciprocated along the beam of a reed fabric weaving machine after each change in the shed and to pick up a weft stake at one end or limit of its throw and upon reverse movement of the shuttle to insert said weft stake in the shed and when it reaches the other limit of its throw to release said weft stake and pick up another one which is laid in the next succeeding shed in the next throw of the shuttle and so on.

A further object of the invention is to provide a thrown shuttle having a gripping or pinching means at each end with parts associated therewith in such a manner that when the shuttle is at one end of its throw, one of the gripping means which was open, operates to close upon and grasp a stake while the other gripping means on the opposite end of the shuttle which was closed upon a stake, is opened to release the same, the gripping means at each end of the shuttle operating in alternation to open and close, and thus release one weft stake and to grasp another one.

Still another object of the invention is to provide a duplex thrown shuttle, which will be positive and efficient in operation at high speed, which is simple in construction and strong and rigid although it is light in weight and which may be easily assembled.

These objects of the invention as well as others together with the many advantages thereof will more fully appear as I proceed with my specification.

In the drawings:—

Fig. 1 is a top plan view of a duplex thrown shuttle embodying my invention.

Fig. 2 is a longitudinal vertical section on an enlarged scale as taken on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 with some of the parts thereof in a changed position.

Fig. 4 is a longitudinal section through the shuttle body, with the parts normally carried thereby omitted therefrom.

Fig. 5 is another longitudinal vertical section on a further enlarged scale, with the parts thereof in a position corresponding to that shown in Fig. 2.

Figs. 6, 7 and 8 are transverse vertical sections through the shuttle as taken on the lines 6—6, 7—7 and 8—8 respectively of Fig. 5.

Fig. 9 is a view in side elevation of the improved shuttle.

Referring now in detail to that embodiment of my invention illustrated in the accompanying drawing, 1 indicates as a whole, the body of the shuttle which is of the usual shape of a thrown shuttle and which may be readily made of metal or fibre. Said body which is of a rectangular cross section, is of a suitable length and is tapered or somewhat pointed at its ends as at 2—2 for engagement with the picks of the loom by which it is thrown across the beam. The shuttle body includes upright front and rear walls 3 and 4 respectively and a bottom wall 5 which together with the tapered ends 2—2 define a recess 6 in the body in which the operative parts of the shuttle are located. In each tapered end 2—2 of the body is an axially disposed opening 7 which communicates with the recess 6. When the shuttle body is made of metal suitable openings 8 may be formed in the walls of the same to materially reduce the weight thereof.

Secured to the bottom wall 5 of the shuttle body, within the recess 6 and midway between the ends thereof is an elongated, longitudinally extending block 9, the ends of which are formed to provide bosses 10—10 and in the top surface of said block between said bosses is formed a bearing groove 11. As both sets of the parts associated with the bosses 10—10 are substantial duplicates, a detailed description of one set of parts will suffice for both. Threaded into each boss 10 from its outer end is a tubular bushing 12 which includes an exteriorly threaded extension 13. Threaded on to said extension is a sleeve 14 which in itself includes a tubular extension 15 of somewhat smaller diameter, the top and bottom surfaces thereof being flattened. Fixed to said flattened surfaces of said tubular extension 15, are the inner ends of top and bottom gripping or pinching members 16 and 16' respectively. The

outer ends of said members are formed to provide jaws 17—17 which extends through the opening 7 in the associated end of the shuttle body, the opposed inner surfaces of
 5 said jaws have transversely disposed teeth 18 to increase the gripping or pinching action thereof. The members 16 and 16' are made of a spring metal so that the jaws are normally urged toward each other and adjacent said jaws are formed opposed wedge
 10 engaging shoulders 19—19.

Slidable in the bushing 12 is plunger 20, the inner end of which includes a rectangular guide head 21 that has a sliding guiding bearing in the groove 11 of the block 9. In said guide head is a transversely disposed rectangular recess 22 (see Fig. 5) in which a cross head 23 is securely fixed by a pin 24. The cross head carries a laterally extending stud 25 on that end adjacent the side wall 3, the purpose of which will appear later. The outer end of the plunger 20 is threaded to receive a washer and coacting adjustable lock nuts 27 which are located in
 25 an upwardly opening recess 28 provided in the bushing 14 for that purpose. Threaded into the outer end of said plunger is the inner end of a wedge rod 29, which has sliding bearing in the extension 15 on the sleeve 14. The outer end of said rod 29 carries a duplex wedge 30 adapted to be engaged with the opposed shoulders 19—19 of the gripping members. When the rod 29 moves or is projected endwise outwardly, the wedge 30
 30 by reason of its engagement with said shoulders 19 will cause the gripping or pinching jaws to be spread apart or open as shown at the left hand end of Fig. 2 and when said rod 29 is retracted inwardly, said wedge is withdrawn from said shoulders
 40 and the yielding action of said members 16, 16' will close said jaws to tightly grip upon such a member or object as is presented between them as for example a weft stake of reed or like material.

Means are provided for imparting endwise movement to the wedge rods in alternation so that when the shuttle is in operation and approaches the limit of its throw in one direction across the beam of the loom or weaving machine with which it is used, the jaws at the advancing end thereof and which are open, are caused to be closed, while the jaws at the trailing end thereof which were closed upon a stake are caused to be opened. When the shuttle approaches the limit of its throw in the other direction, the last mentioned jaws are closed and the first mentioned ones are opened. Associated with
 60 each wedge rod is a trigger 31, positioned between the block 9 and side wall 3 of the shuttle, the bottom end of said trigger being pivoted on a shifting fulcrum formed by a screw 32 carried on the rear end of a link
 65 33. The front end of said link is pivoted by

a screw 34 to the end of the block 9. In said trigger near its bottom end is an opening 35 (see Fig. 6) to receive the stud 25 on the cross head 23. The top end of said trigger projects a slight distance above the associated side wall 3 of the shuttle so as to engage with suitable tripping shoulders on the loom or weaving machine during the throw of the shuttle. As best shown in Fig. 1, the top ends of said triggers are offset into different transverse planes of the shuttle so as to engage with suitable tripping means on the loom not herein shown. In the throw of the shuttle the triggers will engage with said tripping means and both swing in the same direction, but as the gripping or pinching jaws face in opposite directions, it is apparent that when the jaws on one end of the shuttle are caused to open, the jaws on the other end are caused to close and vice versa. By reason of the adjustment provided by the threaded connections between the wedge rods 29 and plungers 20 as well as the threaded connections between the other parts of the mechanism, the opening and closing of the jaws may be nicely determined.

When the shuttle is being thrown to the left as indicated by the arrow A in Fig. 2, the gripping or pinching jaws at the left hand end thereof are open and the jaws at the right hand end of the shuttle are closed to grip or pinch a member 37 between them which may be a weft member or stake such as is employed in the weaving of reed fabric. When said shuttle reaches the end of its throw towards the left through the warp shed, the triggers engage coacting tripping devices and the jaws at the right hand end open to release the weft or stake member 37 and the jaws at the left hand end of the shuttle close or grip upon another member 37^a as best shown in Fig. 3. When the shuttle is thrown to the right as indicated by the arrow B in Fig. 3 said weft member 37^a is inserted through the shed and deposited therein and the jaws at the right hand end thereof which are open now close upon or grip another weft member and so on.

It is apparent that my improved shuttle which is of the so called "pinch" type is duplex not only in construction but in operation, but carries no pirn or bobbin. It is positive and efficient in operation at the high speed at which it is thrown, and although simple in construction, the parts are so formed as to be strong and rigid and thus withstand the jar or shock to which they are subjected in use.

The shuttle above described is especially adapted for use in a weaving machine such as is shown in my copending application Serial No. 81,523 filed on an even date herewith and to which cross reference is hereby made.

While in describing my invention, I have

referred in detail to the construction and form as well as the relative position and arrangement of the parts thereof, the same is for the purpose of illustration only so that I do not wish to be limited thereto except as may be pointed out in the appended claims.

I claim as my invention:

1. A thrown pinch shuttle embodying therein, a shuttle body having a longitudinal opening in each end and cooperating pinching members extending through each opening and projecting beyond each end of the shuttle body but not forming a part thereof, and movable trigger members located on the shuttle body substantially midway between its ends, one associated with the pinching members at each end of the shuttle, adapted in the thrown movement thereof, to engage fixed parts of a loom for opening and closing said pinching members.

2. A thrown pinch shuttle embodying therein, a shuttle body, a pair of cooperating pinching members at one end of the body, with their inner ends fixed with respect to the shuttle body and with their outer ends capable of yielding toward and away from each other, a wedge member interposed between said members, and movably guided in the body, and a trigger arranged at a point between the ends of the body and operatively engaged with said wedge rod and adapted as the shuttle approaches the end of its throw to directly engage a fixed part of the loom for actuating the wedge rod to open and close said pair of cooperating pinching members.

3. A thrown pinch shuttle embodying therein, a shuttle body, a pair of cooperating pinching members at one end of the body, with their inner ends fixed with respect to the shuttle body and with their outer ends capable of yielding toward and away from each other, a wedge member interposed between said members, and movably guided in the body, and a trigger arranged at a point midway between the ends of the body associated with the inner end of said wedge rod and adapted as the shuttle approaches the end of its throw to directly engage a fixed part of the loom for actuating the wedge rod to open and close said pinching members.

4. A thrown shuttle embodying therein, a shuttle body, a pair of cooperating pinching members at each end of the body, a wedge block positioned between each pair of members, means associated with the inner end of each wedge rod providing a non-rotative sliding bearing therefor, a trigger located at a point midway between the ends of said body and operatively engaged with the inner end of each wedge rod and operative as the shuttle approaches each end of its throw to engage a fixed part of the loom

and to impart endwise movement to said wedge rods to open and close said pairs of cooperating pinching members in alternation.

5. A thrown shuttle embodying therein, a shuttle body, a pair of cooperating pinching members at each end of the body, a wedge block positioned between each pair of members, means on the shuttle body providing a guide groove, means on the inner end of each wedge rod and slidable in said groove for holding the wedge rod against rotation while permitting reciprocation thereof, and an actuating trigger operatively connected to the inner end of each wedge rod for reciprocating them to open and close said pinching members.

6. A thrown shuttle embodying therein, a shuttle body, a pair of cooperating pinching members at each end of the body, a wedge block positioned between each pair of members, means on the shuttle body providing a guide groove, means on the inner end of each wedge rod and slidable in said groove for holding the wedge rod against rotation while permitting reciprocation thereof, an actuating trigger operatively supported in said shuttle body, and a laterally extending stud on the inner end of the wedge rod engaged with said trigger.

7. A thrown pinch shuttle embodying therein, a shuttle body, a bearing block on the bottom thereof, a tubular bushing in said block, a sleeve adjustably carried by said bushing, a pair of cooperating pinching members fixed to said sleeve, a wedge rod slidable through the sleeve for opening and closing said pinching members, a plunger slidable in said bushing, and means for actuating said plunger.

8. A thrown pinch shuttle embodying therein, a shuttle body, a bearing block on the bottom thereof, a tubular bushing in said block, a sleeve adjustably carried by said bushing, a pair of cooperating pinching members fixed to said sleeve, a wedge rod slidable through the sleeve for opening and closing said pinching members, a plunger slidable in said bushing, and including a guide head slidable on said block and a trigger pivoted on said block and operatively connected to said guide head.

9. A thrown pinch shuttle embodying therein a hollow shuttle body having an axially disposed opening in each end thereof and a pair of cooperating pinching members arranged in each end of the hollow body and having parts normally extending through the opening thereof and beyond the same.

10. A thrown pinch shuttle embodying therein a hollow shuttle body having an axially disposed opening in each end thereof, a pair of cooperating pinching members arranged in each end of the hollow body and having parts normally extending through

the openings thereof and beyond the same, and means associated with each pair of pinching members and carried by said body at a point substantially between its ends for opening and closing the associated pair of pinching members in alternation as the shuttle approaches the ends of its throw.

11. A thrown pinch shuttle embodying therein a hollow shuttle body having an axially disposed opening in each end thereof, a pair of coacting pinching members arranged in each end of the hollow body and

having parts normally extending through the opening thereof and beyond the same and means carried by said body at the middle thereof and adapted to engage fixed parts of a loom as the shuttle approaches the ends of its throws for actuating the said pairs of pinching members to open and close them on alternation.

In testimony whereof, I have hereunto set my hand, this 17th day of December, 1925.

MARSHALL B. LLOYD.