

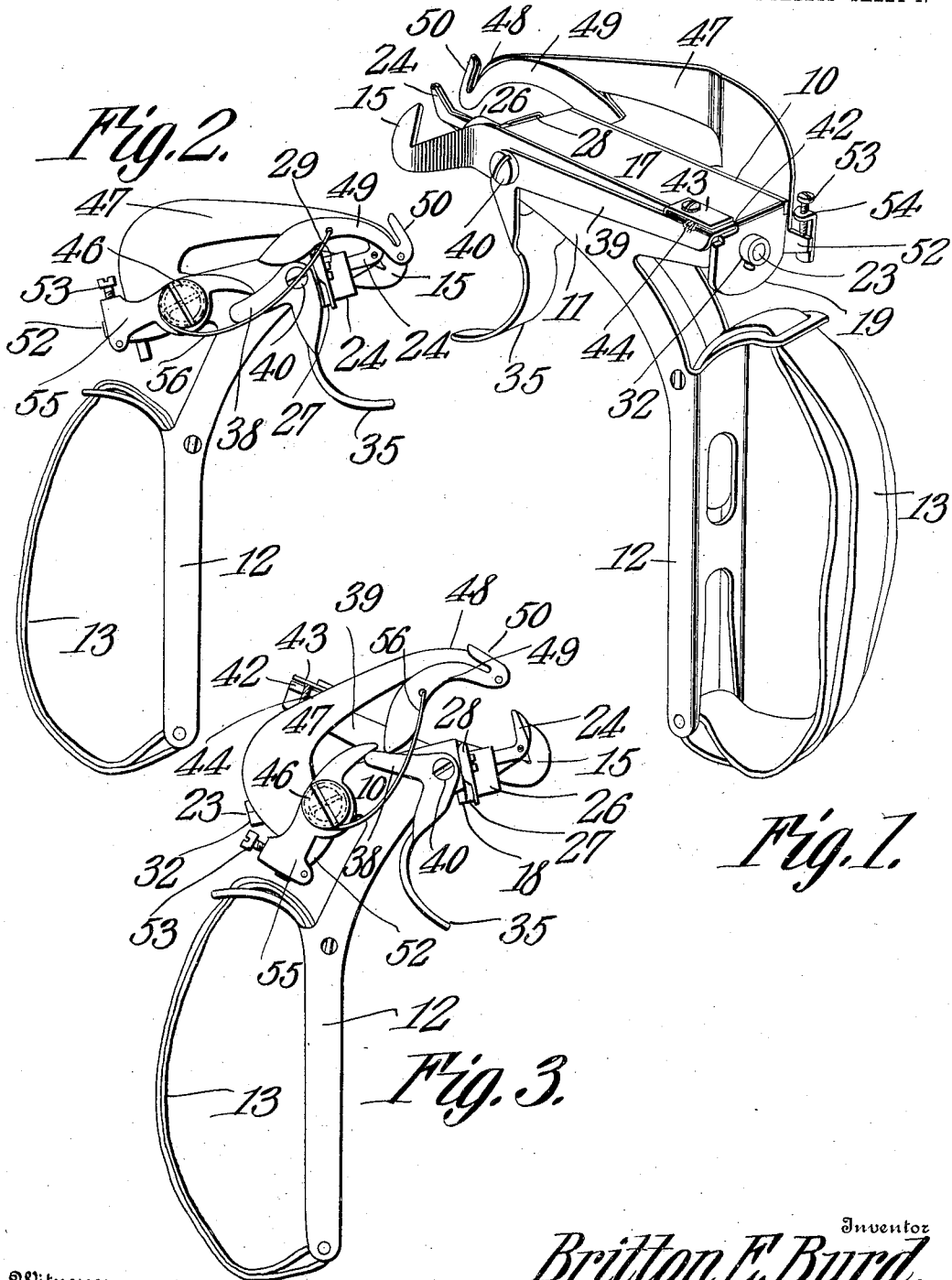
B. E. BYRD.
KNOTTER.

APPLICATION FILED NOV. 18, 1908.

937,693.

Patented Oct. 19, 1909.

2 SHEETS-SHEET 1.



Witnesses

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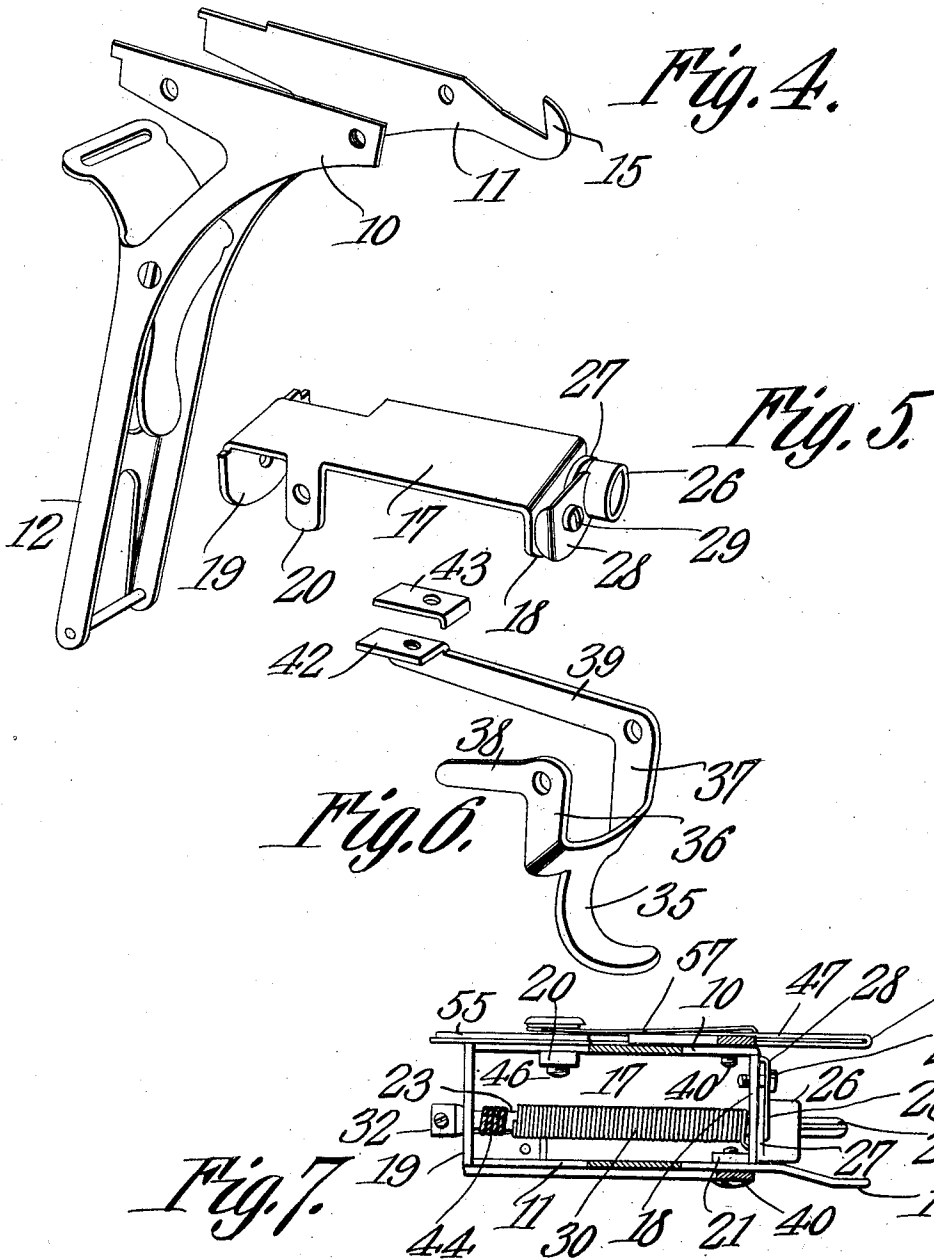
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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KNOTTER.

937,693.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed November 18, 1908. Serial No. 463,300.

To all whom it may concern:

Be it known that I, BRITTON E. BYRD, a citizen of the United States, residing at Durham, in the county of Durham and State of North Carolina, have invented a new and useful Knotter, of which the following is a specification.

This invention relates to hand operated knotters and has for its principal object to improve, simplify and cheapen the construction of devices of this type.

A further object of the invention is to simplify and improve the means for operating the knot tying bill.

A still further object of the invention is to simplify and improve the mechanism employed for gripping and holding the thread and removing the thread from the tying bill after the completion of the tying operation.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims; it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a perspective view of a knotter constructed in accordance with the invention. Fig. 2 is a side elevation of the machine with the parts in position to receive the thread. Fig. 3 is a similar view showing the parts in the position assumed at the completion of a thread tying operation. Fig. 4 is a detail perspective view of the main carrying frame of the machine. Fig. 5 is a similar view of the supporting frame of the tying bill. Fig. 6 is a detail perspective view of the finger operated lever. Fig. 7 is a sectional plan view through the frame in the plane of the tying bill.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In carrying out the present invention all, or practically all, of the parts are formed of stamped sheet metal so as to materially reduce the cost of construction and permitting all of the parts to be standardized.

The main carrying frame, as shown in Fig. 4, is formed of a single sheet of metal that is bent to form a pair of side plates 10 and 11 and a handle 12, the latter being provided with attaching devices for a hand strap or loop 13 of any ordinary construction. The side plate 11 is of greater length than the side plate 10 being continued forward and turned up to form a bill 15 that acts as a thread guide during the tying operation.

The second section of the frame shown in Fig. 5 comprises a plate 17 having downturned front and rear walls 18 and 19, and a pair of downwardly bent side lugs 20 and 21 all of these parts being formed of a single piece of metal.

The front and rear walls 18 and 19 of the frame are provided with bearing openings for the passage of a shaft or spindle 23 which carries at one end a tying bill 24 of ordinary construction and the cutter blade of this bill is arranged to be actuated by an eccentrically disposed collar 26 having a base flange 27 that is locked in place by a clamping plate 28, and securing bolt or screw 29. The inner portion of the shaft 23 is surrounded by a coiled torsion spring 30, one end of which is connected to the shaft and the other end to the casing. The function of the spring is to restore the parts, and especially the tying bill, to initial position immediately after each knot tying operation. At the rear end of the shaft is arranged a collar 32 which is held in place by a suitable set screw and serves to prevent longitudinal displacement of the shaft.

The thumb or finger piece 35 shown in Fig. 6, is made of a single piece of stamped sheet metal, so bent as to form a pair of approximately vertical parallel arms 36 and 37, from which extend arms 38 and 39, the latter arms being approximately horizontal. This finger piece is pivotally connected to the main frame by a pair of screws 40 that pass through diametrically opposite open-

ings formed in the main frame, and one of the screws is continued through the downwardly extending lug 21 of the frame member 17 for the purpose of forming an additional frame securing means. At the rear end of the arm 39 is an inwardly bent lug 42, which, in connection with a small plate 43, forms a clamp for the reception of one end of a flexible actuating device 44. This actuating device is preferably in the form of a cord that is wound around the rear end of the shaft 23, and when the finger piece is actuated, and arm 39 is moved upward from the position shown in Fig. 2 to that illustrated in Fig. 3, the cord will be unwound from the shaft and the latter will be turned the proper distance to effect the tying of the knot and the cutting of the thread. This operation takes place against the resistance offered by the torsion spring 30 and when pressure on the thumb piece is relieved, the spring will act to restore the tying shaft to its initial position.

Extending through the rear portion of the side plate 10 and the lug 20 is a screw 46 on which is mounted a thread clamping lever 47, the forward edge of which terminates in a downwardly curved arm 48 and to the extreme end of this arm is pivoted a thread clamping member 49 having a hollow clamping jaw 50 which embraces the clamping arm 48 in order to more securely hold the thread. The rear end of the lever 47 is provided with a rearwardly extended integral arm 52 on which bears a screw 53 carried by an ear 54 that forms a part of a small lever 55, also pivoted on the screw 46. The forward arm of the lever 55 rests on the arm 38 of the thumb or finger piece, and the rear end of the thread clamping member 49 likewise rests on the arm 38. To assist in maintaining these parts in proper relative position and to actuate the thread clamping member 49, a small spring 56 is employed. One end of the spring passes through a diametrical opening formed in the screw 46, and thence is wound several times around the screw, while the opposite or outer end of the spring is attached to the thread clamping member 49, the point of attachment being so located that the tendency of the spring will be to move the clamp into operative engagement with the thread, but when the parts are in the normal position shown in Fig. 2, the rear end of the thread clamping member will rest on the thumb or finger piece and the engaging face of the clamp member will be held outward from the arm 48 in order to permit the ready insertion of the thread.

The operation of this device, so far as the tying of the knot is concerned, is well known to those skilled in the art and does not require any detailed description.

During the thread tying operation, the thumb piece is moved inward toward the main frame from the position shown in Fig. 2 to that illustrated in Fig. 3, and the arm 38 of the thumb piece will operate on the inner end of the lever 55 raising the same and causing the rear end of the lever to be depressed. The screw 53 carried by the lever will thereupon act upon the arm 52 and the main thread clamping lever will be carried up toward the position shown in Fig. 3, while the butt of the clamping member 49 will ride on the arm 38 so as to prevent abrupt movement to thread clamping position. The thread clamping operation will therefore be more or less gradual and the time of operation may be adjusted by turning the screw 53.

As soon as pressure on the thumb or finger piece is relieved, the tying bill shaft will be restored to its initial position as before stated, while the spring 56 will perform a like function for the thread clamping devices.

What is claimed is:—

1. In a hand operated knotter, a two part sheet metal frame comprising a handle member having its side flanges extended to form the side plates of the main frame, and a main frame plate bent to form downwardly extending front and rear walls, and side attaching lugs, a thumb lever pivoted to the frame and having a pair of spaced rearwardly extending arms arranged on opposite sides respectively of the main frame, a tying-bill, a tying-bill shaft, an operating means connecting one of the thumb lever arms to the shaft, a thread clamping device, and means operable from the other arm, and a lever for actuating said thread clamping device.
2. In a hand operated knotter, a frame, a tying-bill, a tying-bill shaft journaled in the frame, a thumb lever, a flexible member wound around the shaft, and a clamping plate carried by the thumb lever and arranged to receive and hold one end of said flexible member.
3. In a hand operated tying-machine, a frame, a tying-bill, a tying-bill shaft, a thumb lever arranged to operate said shaft, a main thread clamping lever, a secondary lever pivoted on the same pivot as the main lever, an adjustable connection between the two levers, and an arm extending from the thumb lever and engaging said secondary lever.
4. In a hand operated knot tier, a frame, a tying-bill, a tying-bill shaft journaled in the frame, a thread clamping lever pivoted to the frame, a secondary lever pivoted on the pivot as the thread clamping lever, the two levers having superposed lugs near their rear ends, a screw passing through one of

the lugs and engaging the other lug, an arm
carried by the thumb lever and engaging the
secondary lever, and a secondary clamping
member carried by the main clamping lever
5 and held from excessive movement by the
arm of the thumb lever.

In testimony that I claim the foregoing as

my own, I have hereto affixed my signature
in the presence of two witnesses:

BRITTON E. BYRD.

Witnesses:

J. S. PERRY,

R. C. MULLICAR.