(No Model.) 2 Sheets—Sheet 1.

T. F. WARRINGTON.

STOP MOTION DEVICE FOR REVOLVING BOX LOOMS.

No. 475,477. Patented May 24, 1892.

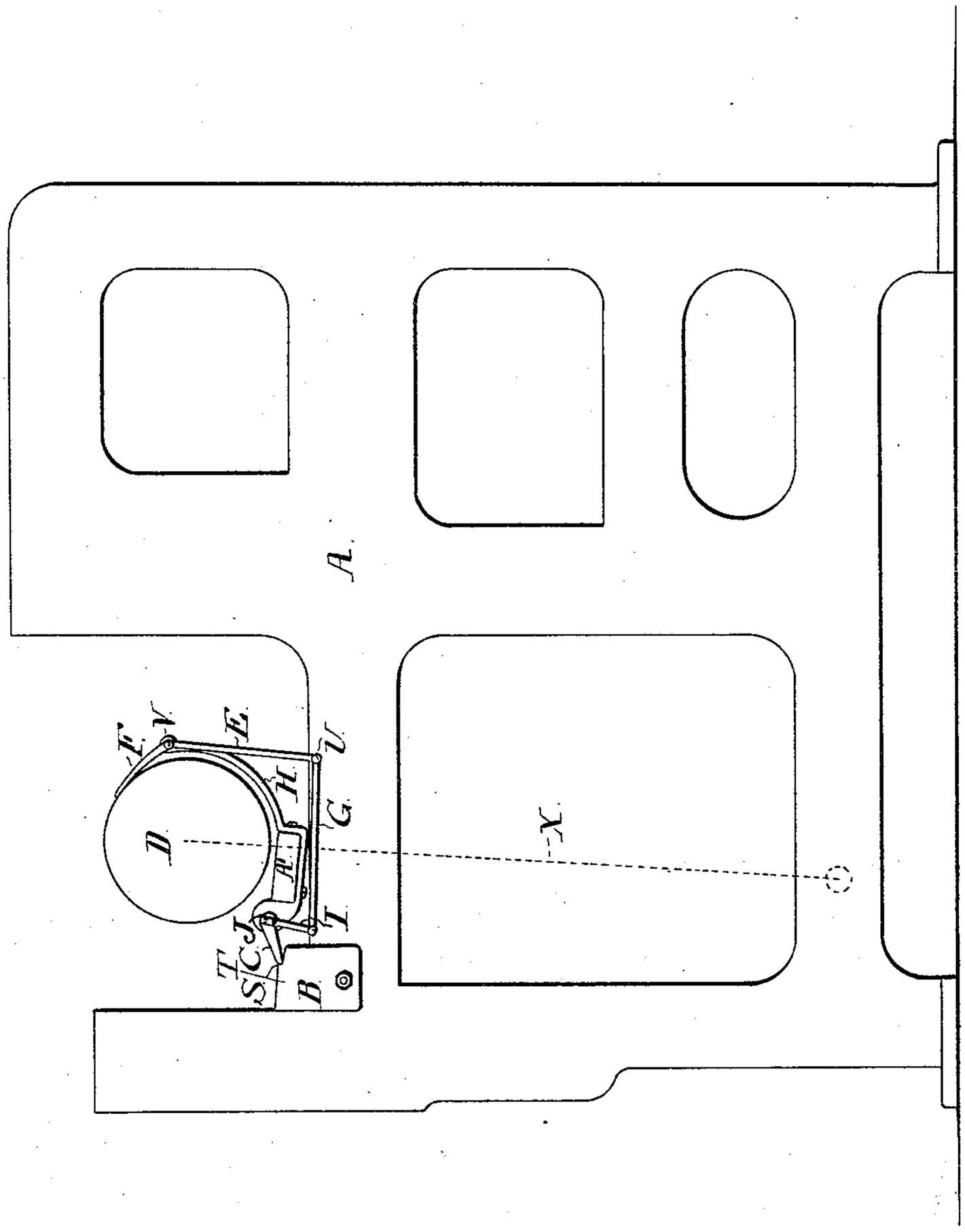

Fig. 1.

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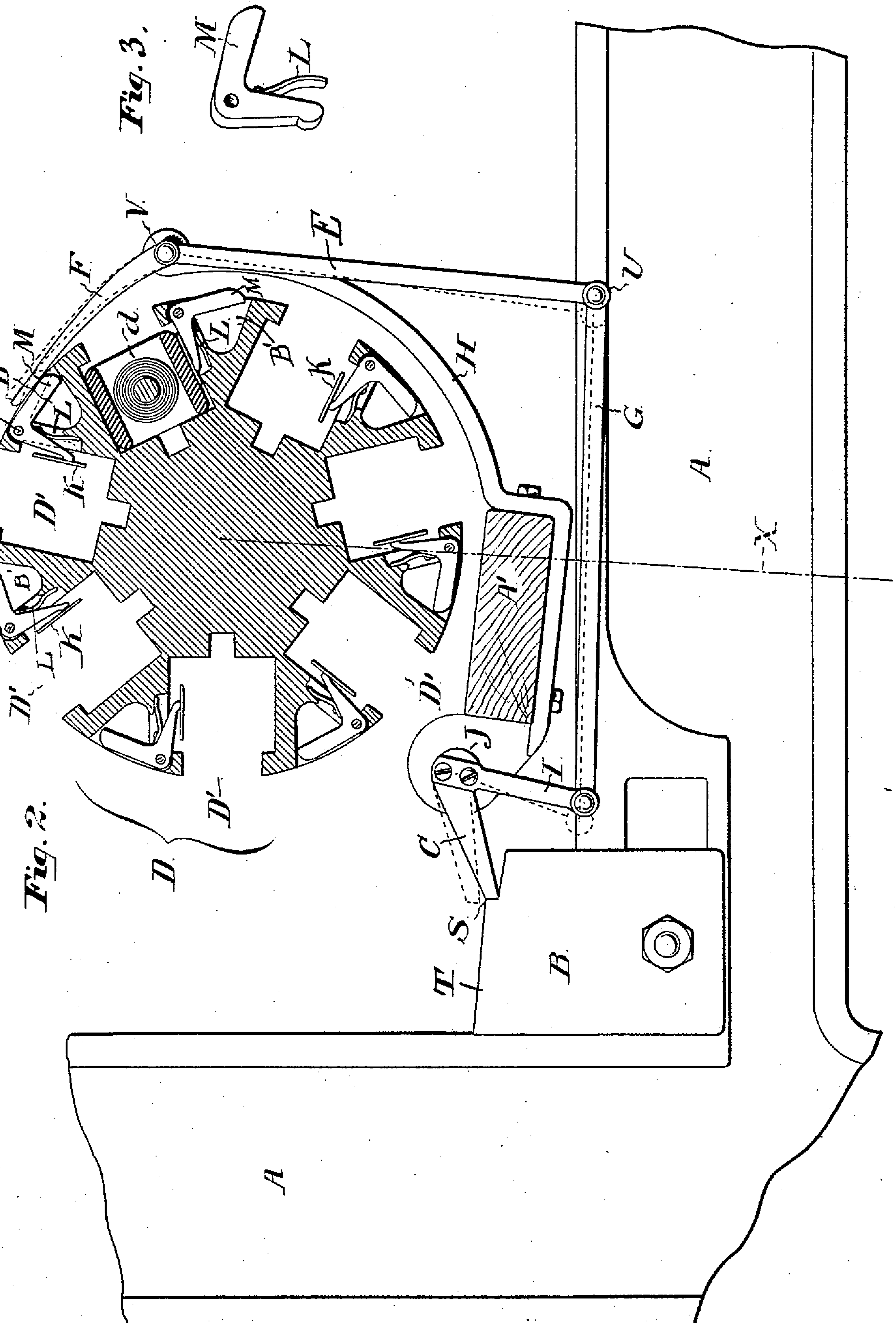

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UNITED STATES PATENT OFFICE.

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STOP-MOTION DEVICE FOR REVOLVING-BOX LOOMS.

SPECIFICATION forming part of Letters Patent No. 475,477, dated May 24, 1892.

Application filed June 13, 1890. Serial No. 355,328. (No model.)

To all whom it may concern:

Be it known that I, THOMAS FRANCIS WARRINGTON, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Stop-Motion Devices for Revolving-Box Looms, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to what are usually known as "revolving-box" or "circular-box" looms, in which the shuttles are seated in a rotating frame or box; and its object is to afford a means of stopping the loom in case any shuttle fails to be thrown "home" into its seat.

In the accompanying drawings, Figure 1 represents a partial side elevation of the frame of the loom, indicating, without elaboration of detail, the general relation of the rotating box and stop-motion devices to the other parts. Fig. 2 is a view, partly in vertical transverse section, through the box, and partly in side elevation, of the stop-motion devices adjacent thereto. Fig. 3 is a view, on a still larger scale, showing the details of one of the levers which are connected with the shuttle-box to determine the action of the stop-motion.

In the general view of Fig. 1 the housing or frame of the loom is indicated at A, the frog at B, the "sword" or oscillating frame of the lathe at X, and the rotating shuttle-box at D. This box is constructed and actuated in the usual manner in this class of looms and is in the instance shown adapted to receive seven shuttles, as indicated in Fig. 2, where the cavities or seats for the shuttles are shown at D′. Within each of said cavities and upon the rear side thereof is a movable strip K, which may either be hinged to the cavity or may be of thin elastic metal fastened upon one side or end, the other being free to move outward or away from the shuttle *d*. This strip is so arranged with relation to the size of the cavity D′ and diameter of the shuttle as that when the shuttle is home the strip will be slightly shifted or sprung outward thereby, resuming its normal position, however, when the shuttle leaves the cavity. Adjacent to each strip K and upon the rear side thereof I mount the devices for communicating this outward movement of the strip to the other devices hereinafter to be described, which constitute the stop-motion proper. Said communicating devices consist of bell-crank levers mounted in proper relation to the strips K in the following manner:

Intermediate between the shuttle-seats D′, I form in the periphery of the box D deep cavities B′, extending radially inward and communicating laterally with one of the shuttle-cavities D′. The bell-crank lever M is pivoted at N, with one of its arms extending through the opening into the cavity D′ and in contact with the outside of the strip K, such contact being maintained by means of a spring L, normally throwing the arm in that direction. The other arm of the bell-crank when in the innermost position (corresponding with the normal position of the strip K) lies flush with the outer periphery of the box; but when said strip K is sprung or turned outward by the presence of the shuttle said arm of the bell-crank M is thrown out of the cavity and beyond the periphery of the box, as indicated by the dotted lines. It is upon the motion of this lever that the action of the stop-motion depends.

The remaining parts will now be described: Upon the front of the shuttle-box frame A is mounted in suitable bearings a rock-shaft J, extending across the front of the lathe, and at each end of said rock-shaft is rigidly attached a finger or "dagger" C, adapted to engage with a stop or shoulder S upon the frog B. When thus engaged, the motion of the lathe toward the breast-beam is arrested and the loom consequently stops. A slight movement of the rock-shaft suffices, however, to turn the finger C upward sufficiently to clear the shoulder S and ride up on the top T of the frog, thus not interfering with the oscillation of the lathe. At the end of the rock-shaft is rigidly attached a lever-arm I, to the lower end of which is pivoted a link G, the other end of said link being pivoted at U to a long lever-arm E, rigidly attached to a short shaft V, whose bearing is in the upper end of a curved arm or bracket H, mounted upon the box-frame A and encircling a portion of the shuttle-box D. A shorter lever-arm F, rigidly attached to said shaft V, overhangs the shuttle-box with its extreme end close to the pe-

riphery thereof in line with the cavities which contain the bell-crank levers M, so that when the arms of said bell-cranks are in their outermost position the lever-arm F will be raised thereby, this position corresponding to the presence of the shuttles in their boxes. The raising of the lever-arm F throws the long arm E to the left, shifting the link G toward the breast-beam and turning the rock-shaft J by means of the arm I, so as to raise the dagger C clear of the shoulder S, as indicated by the dotted lines in Fig. 2. Hence the motion of the lathe will not be checked, and so long as the dagger rests upon the upper surface T of the frog the lever F will not drop down upon the surface of the shuttle-box, but will be supported clear thereof throughout the remaining portion of the forward movement of the loom. When, however, the return of the lathe takes place and the shuttle leaves the box, the strip K resumes its normal position, the bell-crank M thereupon turns down into its cavity, and the lever-arm F drops into close proximity to the surface of the box D, as indicated by the solid lines. This position of the lever-arm correspond with a position of the rock-shaft J, which would bring the dagger C into range of engagement with the shoulder S, so that as the lathe moves forward the dagger will strike the shoulder and stop the loom. Hence it will be seen that the normal tendency of the stop-motion device proper is to stop the loom, said condition continuing during all the time that the shuttle is out of the box or on its way through the shed. It is the presence of the shuttle in its box which alone prevents the operation of the stop-motion devices, so that any failure of the shuttle to be thrown home necessarily results in stoppage at or before the end of the pick. The rotation of the shuttle-box is of course effected during the period when the shuttles are home—viz., during the forward movement of the lathe—and this period corresponds to that position of the parts in which the dagger is supported upon the top surface T of the frog. This support of the dagger relieves the shuttle-box of all pressure from the upper end F of the lever, so that the box is free to rotate without obstruction. So far as I am aware this feature is not found in any device of the same general character heretofore used, in all of which the lever was held with more or less pressure against the surface of the box at all times. In my improvement it is only in contact with the box or with the bell-cranks during that period when the box does not rotate, and when, consequently, such pressure is immaterial.

I am aware that the use of a stop-motion lever actuated by one end of a plunger whose other end extends within the shuttle-cavity of a rotatable shuttle-box is not, broadly speaking, new, such a device being shown in German Patent No. 30,515, and I therefore disclaim the subject-matter thus shown. In such prior device, however, the stop-motion lever is not held clear of the shuttle-box during the period of rotation of the latter, and hence lacks the advantages due to my improvement, as above set forth.

Having thus described my invention, I claim—

The combination of the rotating shuttle-box, the bell-cranks arranged within the periphery of the shuttle-box between the shuttle-seats, the movable strips arranged within the shuttle-seats and in contact with one arm of each of said bell-cranks, the oscillating frame carrying said box, the rocking dagger mounted upon said frame, the frog having a shoulder adapted to engage with said dagger, the stop-motion lever having one arm arranged in proximity to the periphery of the shuttle-box and within the range of movement of the bell-cranks, and means, substantially as described, whereby the other end of said stop-motion lever is connected with the rocking dagger.

THOMAS FRANCIS WARRINGTON.

Witnesses:
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HENRY U. PAUL, Jr.