June 19, 1923. 1,459,038

G. TURNER

MACHINE FOR MAKING MATCH BOOKS

Filed July 29, 1921 3 Sheets-Sheet 1

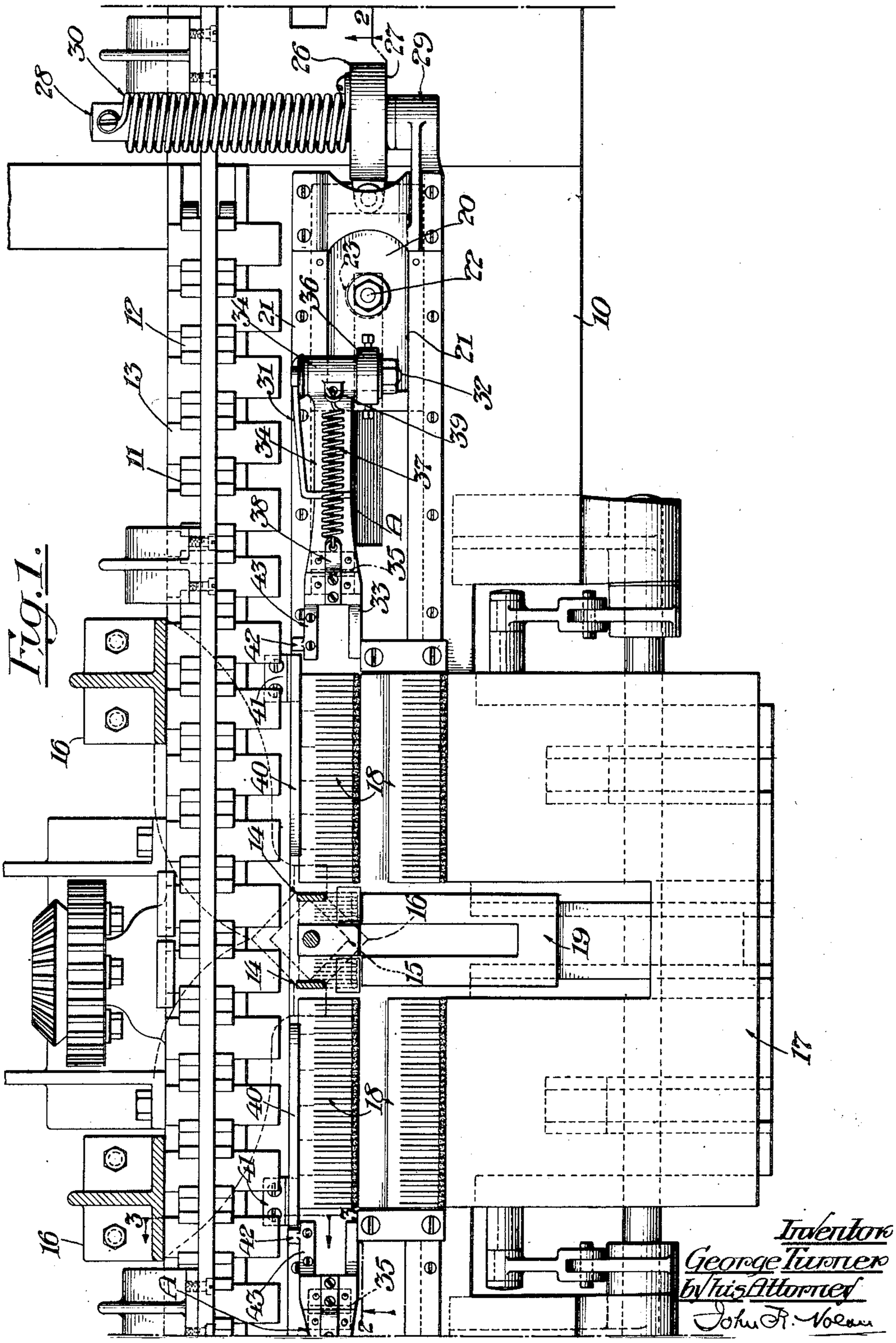

Fig. 1.

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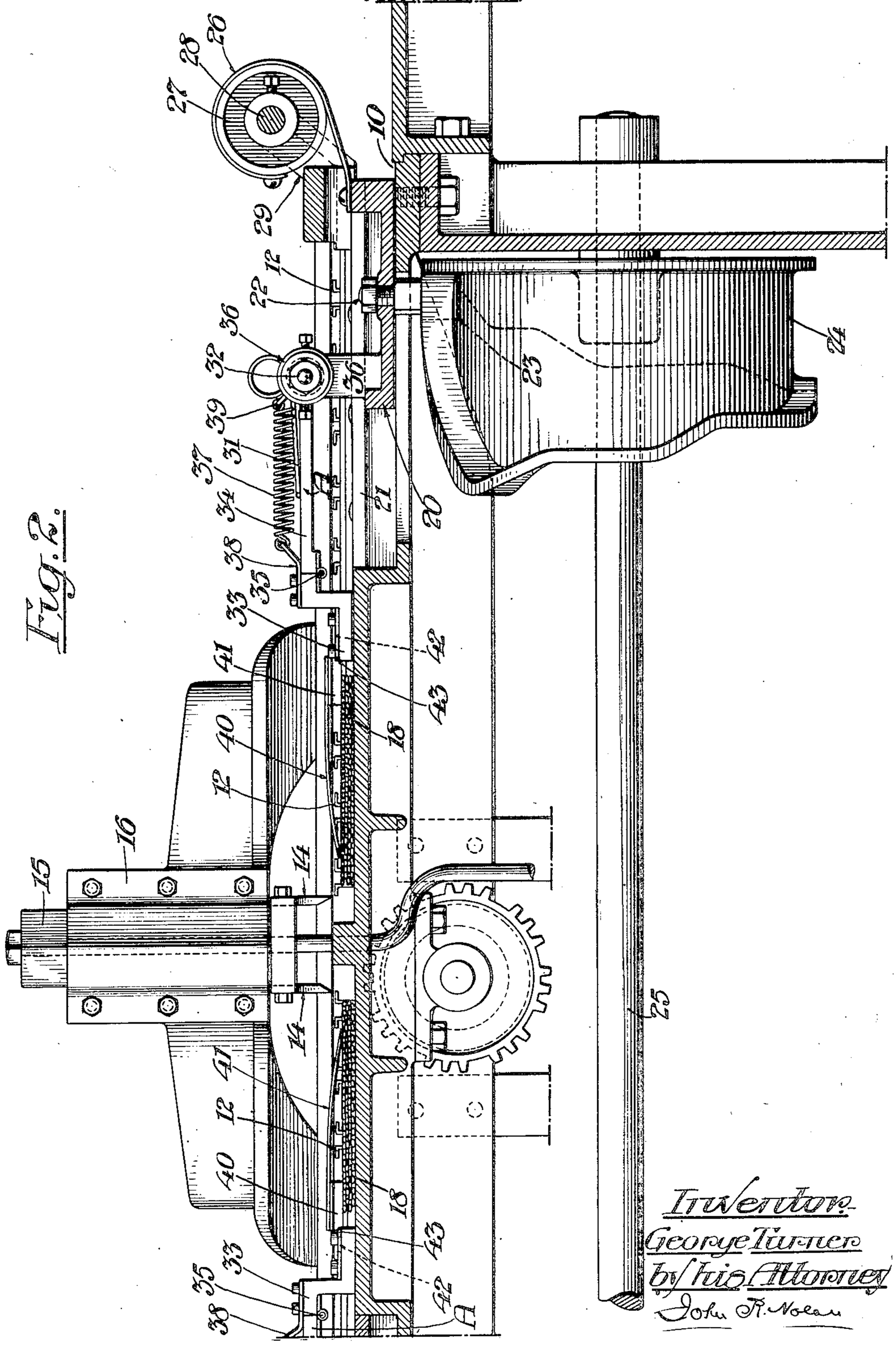

Fig. 2.

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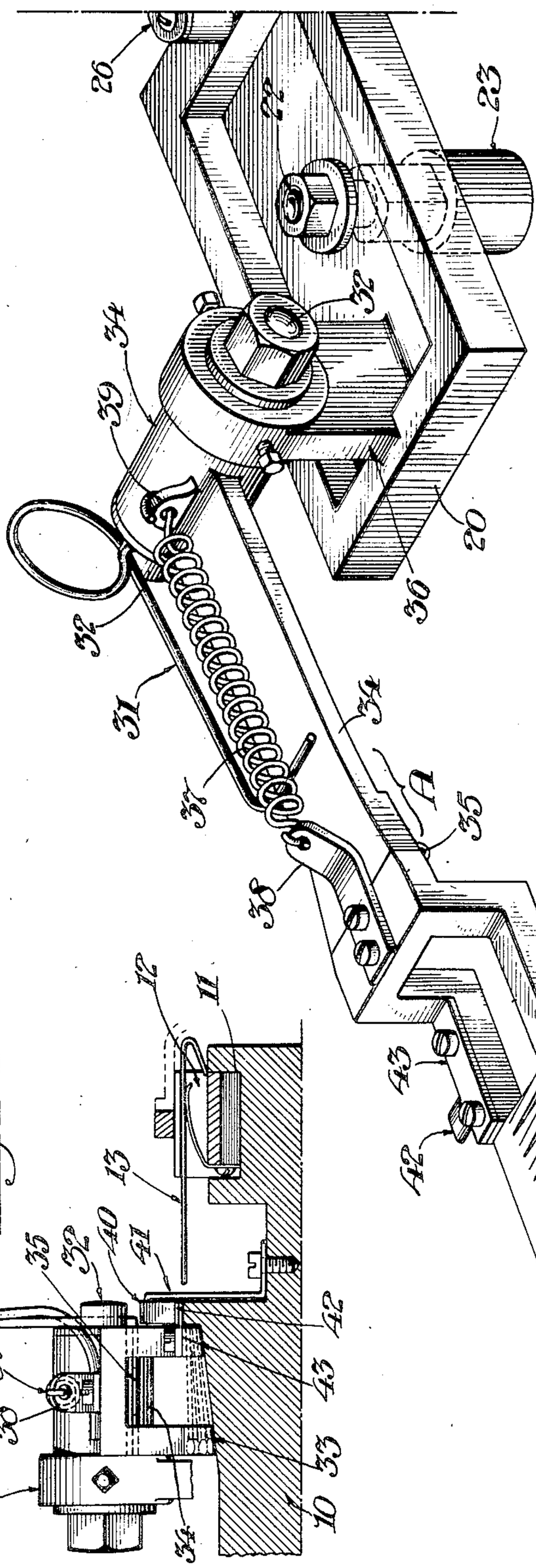

Fig. 4.

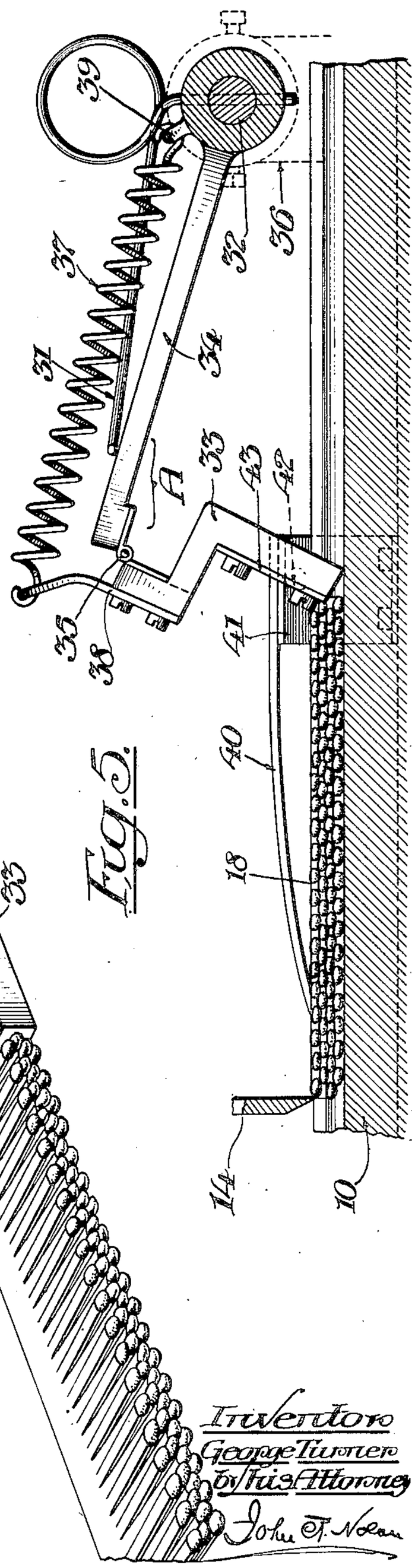

Fig. 5.

Fig. 3.

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Patented June 19, 1923. 1,459,038

UNITED STATES PATENT OFFICE.

GEORGE TURNER, OF BARBERTON, OHIO, ASSIGNOR TO THE DIAMOND MATCH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR MAKING MATCH BOOKS.

Application filed July 29, 1921. Serial No. 488,344.

To all whom it may concern:

Be it known that I, GEORGE TURNER, a citizen of the United States, and resident of Barberton, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Machines for Making Match Books, of which the following is a specification.

This invention relates to machines for making match books, having reference especially to the match-strip feeding mechanism of the machine set out in Letters Patent of the United States No. 1,042,472, dated October 29, 1912.

The patented machine includes an intermittently movable endless carrier into the links of which folded blanks suitable for match-book covers are inserted at one station; means at another station for receiving superposed match strips and supporting them laterally and longitudinally of the path of travel of the carrier; cutter mechanism whereby the margins of such strips are transversely severed; pushers for positively acting upon the strips to advance them intermittently to the path of the cutters in such a manner that cards of predetermined width are progressively severed from the strips, and plungers for successively moving the thus severed cards beyond the cutters and into the covers contained in the carrier; all as fully set forth in said Letters Patent.

In the operation of the patented machine at a relatively high speed the attendant sometimes inadvertently introduces too many superposed match strips, or the match strips become disarranged before or after being positioned in proximity to the cutters. In any event the strips, when endwise acted upon by the pusher, fail to pass freely under the adjacent cutter, thus obstructing the feed and causing a severe strain on the pusher. This occurrence frequently results in the injury of the pusher or its connections and necessitates the stoppage of the machine until the damaged part or parts have been repaired or renewed.

The object of my invention is to obviate the objection above noted; and to that end the invention comprises a jointed pusher device which is so constructed and arranged as to yield or "break" at the joint when the pusher is subjected to abnormal resistance.

The invention also comprises novel features of construction and combinations of parts which will be hereinafter described and claimed.

In the drawings—

Figure 1 is a sectional plan of a portion of a match-book machine equipped with pusher mechanism embodying my invention.

Fig. 2 is a longitudinal vertical section of the machine, as on the line 2—2 of Fig. 1.

Fig. 3 is a transverse vertical section of the same, as on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of one of the pushers, and adjuncts, showing the normal condition of the pusher during the match-strip feeding operation.

Fig. 5 is a longitudinal vertical section through the strip-supporting bed adjacent the pusher, showing the latter in its bent or "broken" condition.

Referring to the drawings, 10 designates a part of the main table provided with a longitudinal way or channel 11 within which the upper run of an intermittently-movable carrier 12 is seated and guided. This carrier comprises an endless chain of links into which end folded cover blanks 13 are inserted at one station of the machine.

A pair of spaced-apart depending cutter blades 14 are vertically-reciprocable in a plane in front of the carrier. These blades are carried by a reciprocative head 15 which is mounted in a suitably disposed guide-frame 16 adjacent the card-inserting station of the machine.

A slide 17 is mounted to reciprocate transversely of the table and to feed spaced-apart double match-strips 18 toward and longitudinally of the carrier and position them with their inner ends adjacent the outer sides of the respective cutters.

Two strip-feeding pushers (A) are mounted to slide on the table in a manner to bear against the outer ends of the strips and advance the strips step-by-step to the respective cutters. During each advancement of the strips the overhanging cutters 14 descend and cut match cards from the inner or leading ends of the respective strips, which cards, as rapidly as they are produced, are inserted into the carrier by a bifurcated

plunger 19 which is reciprocable transversely of the table. The carrier is intermittently advanced to present a successive pair of links and covers to each pair of cards.

Each of the pushers is pivotally connected at its outer end to a slide 20 which is mounted in and between longitudinal guides 21 on the table, the forward or acting end of the pusher resting on the table. Depending from the slide 20 and through a longitudinal guide slot in the table, is a stud 22 provided with a roll 23 which is held in contact with the face of a cam 24 on the main shaft 25 of the machine; the contour of the cam being such that during each rotation thereof periodical progressive movements of the slide 20 corresponding with the number of cards to be cut from the double strip engaged by the pusher are effected. A flexible band 26 is connected with the outer end of the slide and with the periphery of a wheel 27, the shaft 28 of which latter is journaled in a bracket 29 on the table. On this shaft is a coiled spring 30 one end of which is secured to the shaft and the other end to the wheel 27, whereby when the said wheel is rotated through the inward movement of the slide, the spring is wound upon the shaft and the resultant torsional action tends to maintain the slide retracted and the roll 23 in contact with the cam 24.

During the rotation of the cam the pusher is advanced thereby against the action of the spring a distance equal to the width of a match card, and there maintained not only until the card has been severed from the strip and introduced in the cover, but until the bifurcated plunger 19 has been retracted, whereupon the pusher is again advanced by the cam a distance equal to the width of a match card and retained in place as before, and so on until the strip has been finally severed. This done, the torsional spring and connections return the slide 20 and its appurtenances for a succeeding operation. To maintain the acting part of the pusher in contact with the table, and so insure its abutment against the end of the match strip, a spring 31 is provided, one end thereof being secured to the pivot stud 32 for the pusher and the other end being laterally bent to bear upon the top of the pusher.

The mechanism above-described, excepting as hereinafter pointed out in respect to the pushers, is or may be of the same general construction as the corresponding mechanism described in Patent No. 1,042,472 aforesaid.

The two pushers and their supporting and actuating devices are identical in construction and operation, and therefore a description of one of the pushers and its associated parts will suffice.

In pursuance of my invention each pusher comprises a two-part member whereof the parts 33, 34 are hinged or jointed, as at 35. The forward or acting part 33 preferably comprises an angular bifurcated foot the free end of which is normally positioned to bear against the adjacent end of the match strips on the table, as above mentioned. The outer end of the part 34 is pivotally hung on the stud 32 which projects from an upstanding lug 36 on the slide 20.

The two hingedly connected parts are normally held in end to end relation by means of a tension spring 37, one end of which is conveniently secured to an ear 38 on the part 33 and the other end to an ear 39 on the hub of the part 34. (See Fig. 4).

Adjacent one side of the path of the pusher, is supported a longitudinally-extending inclined spring arm 40, the upper end of which is remote from the cutter and is secured to a suitably-disposed bracket 41 on the table. This arm is so arranged in juxtaposition to the pusher that during the travel of the latter a laterally-projecting stud 42 on the forward part of the pusher co-acts with the arm, which stud is preferably formed on a plate 43 affixed to the part 33. During the forward or active travel of the pusher toward the cutter, the stud 42 lies below and passes under the spring arm, and as the stud comes in contact with the lower or free end of the arm it forcibly raises such end and passes onward therefrom. In its return travel the stud 42, being higher than the free end of the arm, rides upon the top surface of the arm thus bodily lifting the pusher sufficiently to enable the attendant to insert new match-strips in the machine while the pusher is being returned to its outer or starting position. When the pusher has nearly reached the limit of its return travel, the stud 42 escapes the higher end of the bar and the pusher, dropping, assumes its active position behind the strips.

Under normal conditions the jointed pusher operates precisely as a solid pusher to advance the strips positively step-by-step to the cutter, but in the event of the free passage of the strips to the cutter being obstructed or interfered with for any reason, such, for example, as the delivery of too many superposed strips by the attendant, or the disarrangement of the strips when they are in the machine, the pusher, being positively advanced against the opposing match strips, will yield or buckle upward at the joint 35 against the stress of the spring 37, as illustrated in Fig. 5, and thus obviate all liability of buckling and jamming the strips against the cutter. The upward movement of the joint of the pusher, when it "breaks," serves as a signal to the attendant to stop the machine and correct the trouble. The arm 40 serves as an over-

hanging stop for the stud 42 on the forward arm of the pusher when the pusher is buckled as above described.

It is to be understood that my invention is not limited to the structural details herein disclosed, as the construction may be modified within the principle of my invention and the scope of the appended claims.

I claim—

1. In match-strip feeding mechanism for match-book machines having a cutter operable to sever successive match cards from the strips, a pusher reciprocable toward and from the cutter and operative in its forward movement to act against the end of the strips remote from the cutter, means for reciprocating said pusher, and means for raising said pusher and maintaining it raised during its return movement.

2. In match-strip feeding mechanism for match-book machines having a cutter operable to sever successive match cards from the strips, a pivotally supported pusher reciprocable toward and from the cutter and operable in its forward movement to act against the end of the strips remote from the cutter, said pusher having a lateral projection, means for reciprocating said pusher, and a longitudinally-extending inclined arm arranged adjacent the path of the pusher and so positioned that in the forward and return travel of the pusher the projection passes respectively below and above the arm.

3. In match-strip feeding mechanism for match-book machines having a cutter operable to sever successive match cards from the strips, a pusher comprising two hingedly connected sections whereof the forward or acting section is provided with a lateral projection, a member to which the outer end of the other section is pivotally connected, a spring connecting said sections and tending to maintain them normally in active position, means for reciprocating said member toward and from the cutter, and a longitudinally-extending inclined element arranged adjacent the path of the pusher and so positioned that in the forward and return travel of the pusher the projection passes respectively below and above the said element.

Signed at Barberton, in the county of Summit and State of Ohio this 23 day of July A. D. 1921.

GEORGE TURNER.