(No Model.) 3 Sheets—Sheet 1.

E. WRIGHT.

LOOM.

No. 452,328. Patented May 12, 1891.

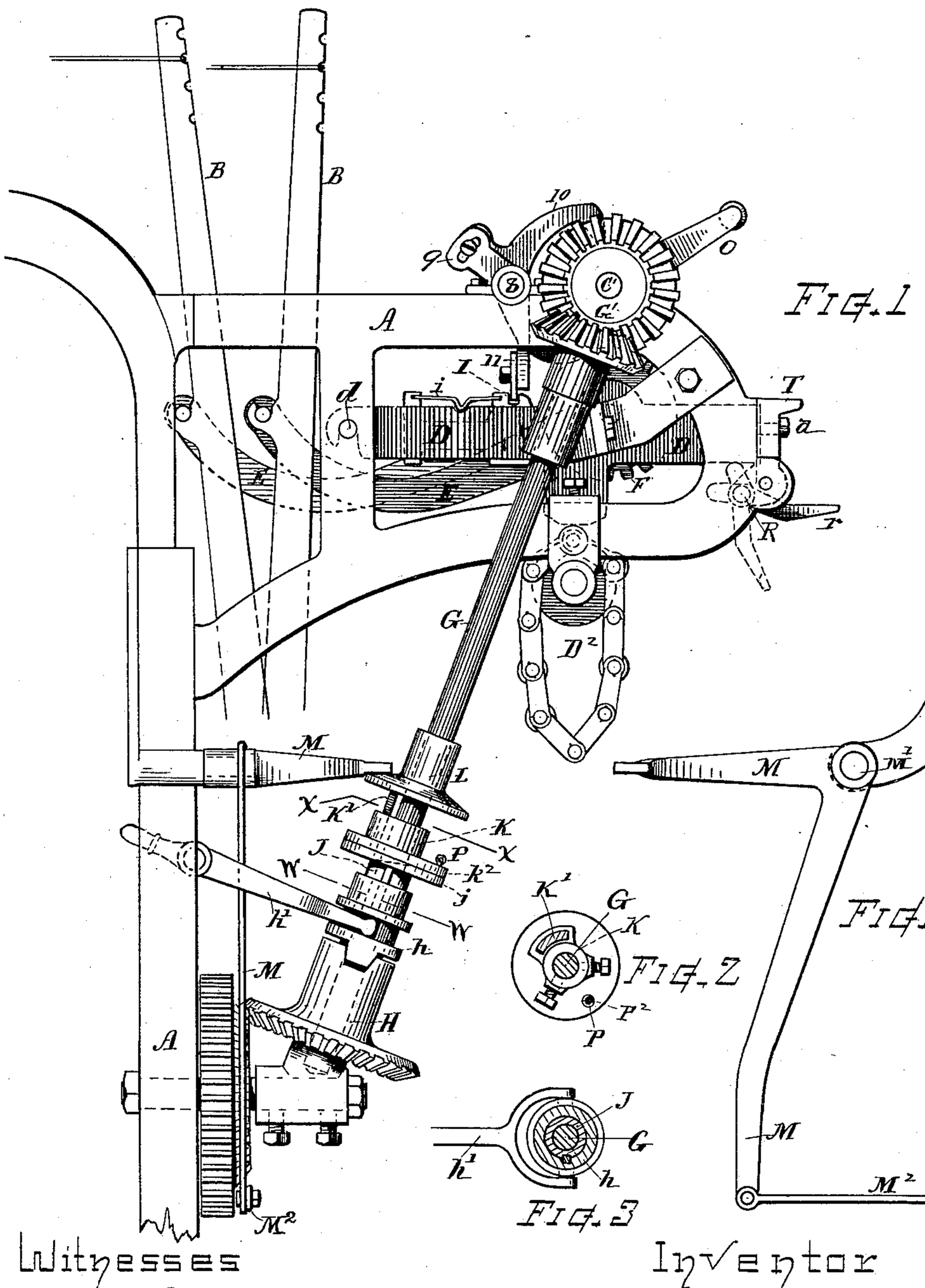

FIG. 1

FIG. 2

FIG. 3

FIG. 4

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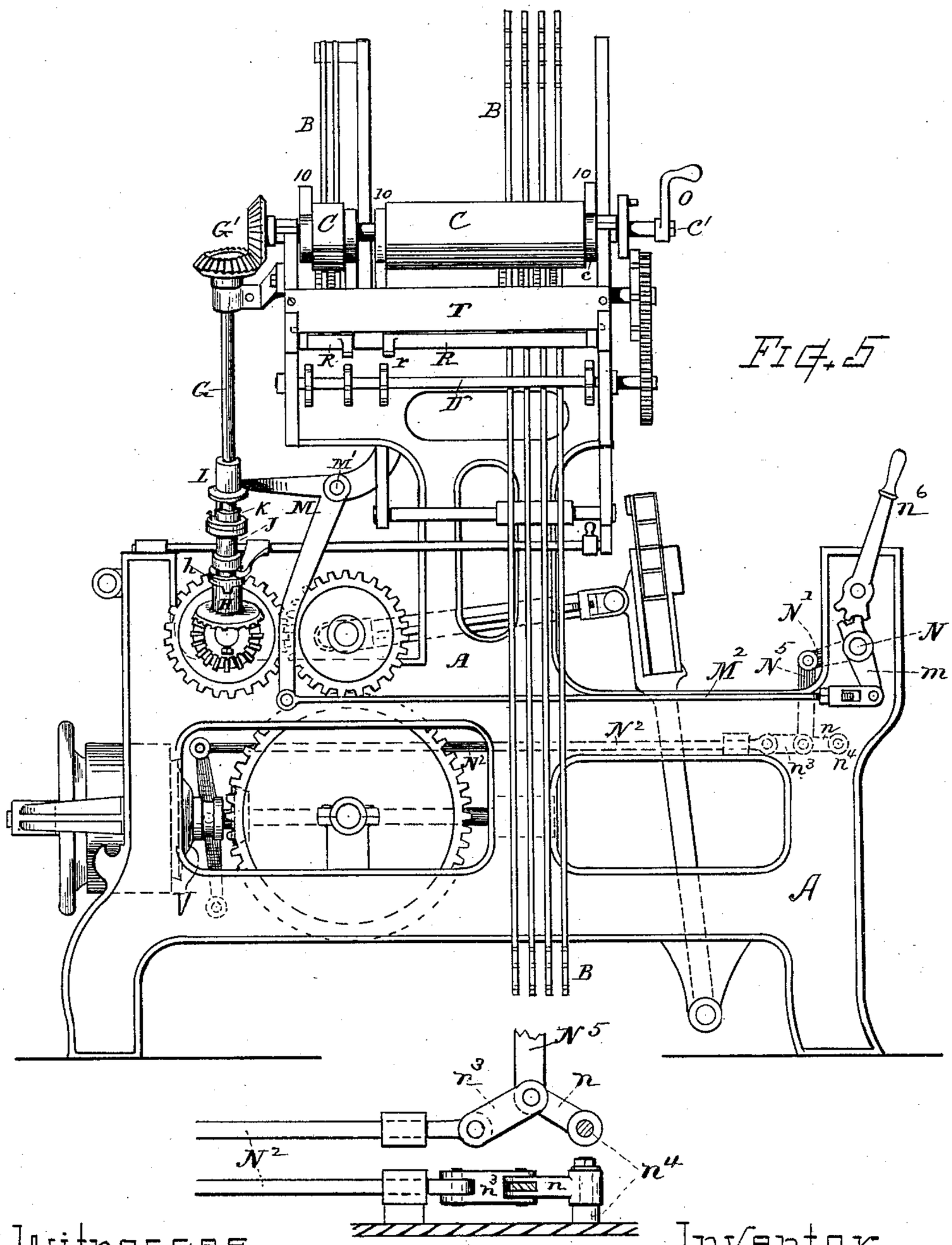

FIG. 5

FIG. 6

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LOOM.

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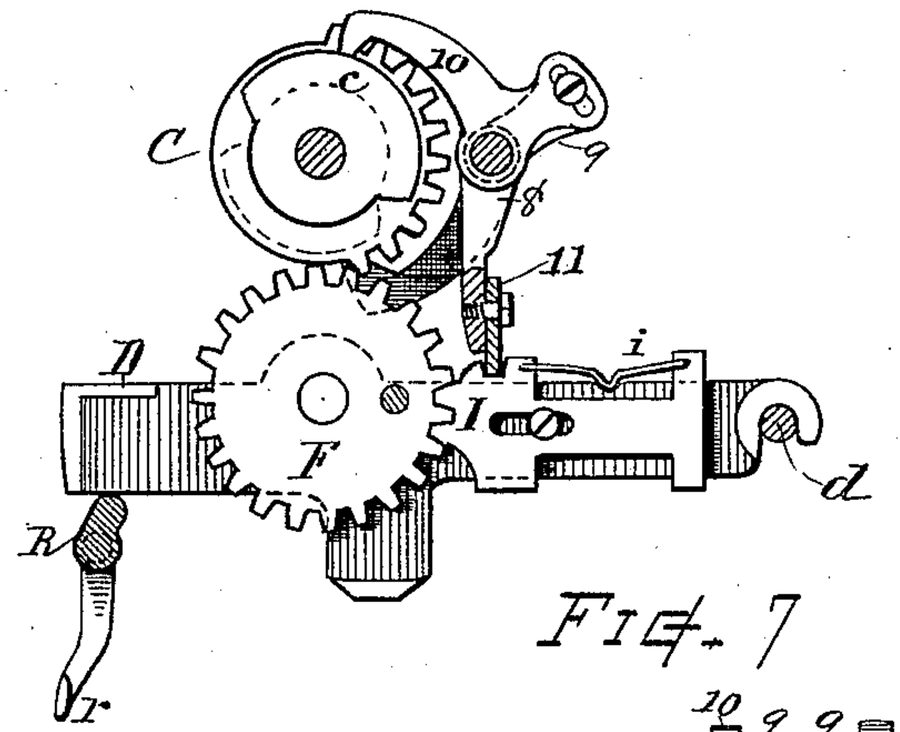

FIG. 7

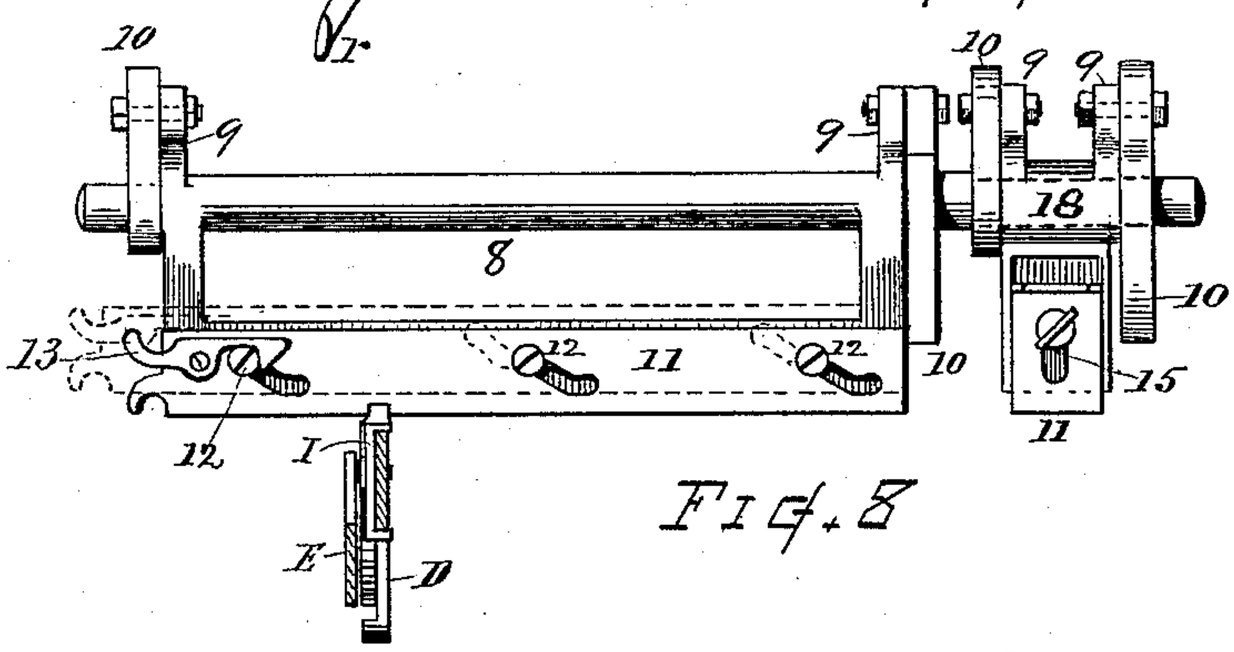

FIG. 8

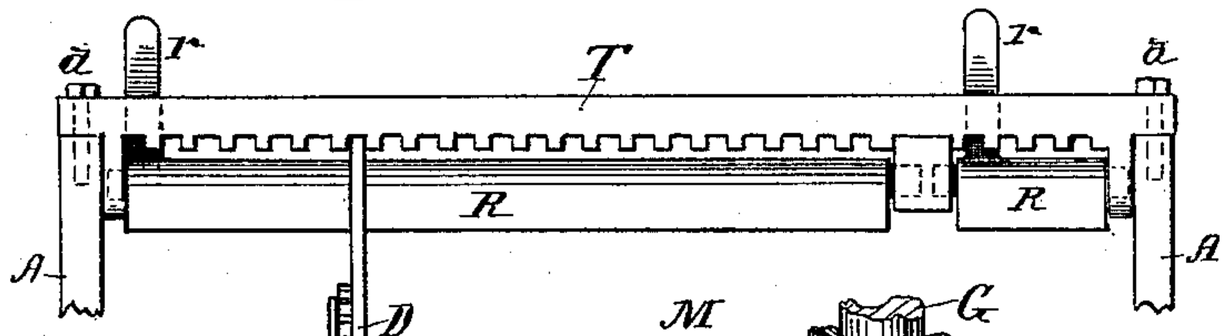

FIG. 9

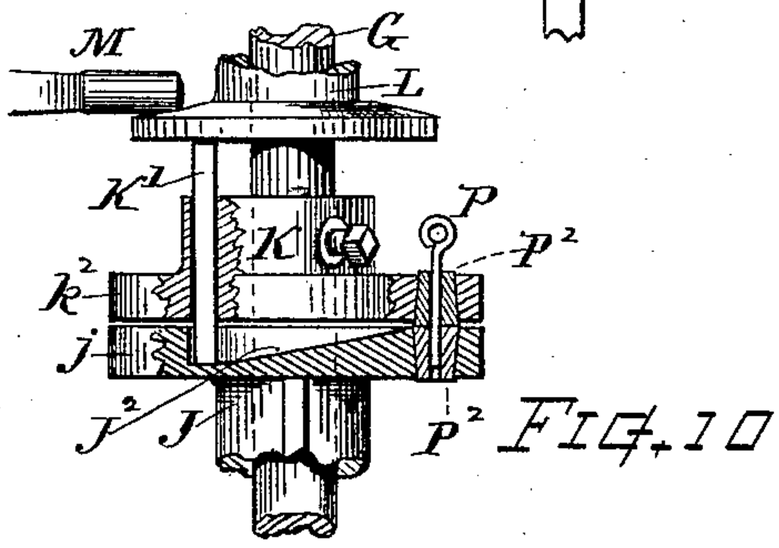

FIG. 10

Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD WRIGHT, OF WORCESTER, ASSIGNOR TO THE DAVIS & FURBER MACHINE COMPANY, OF NORTH ANDOVER, MASSACHUSETTS.

LOOM.

SPECIFICATION forming part of Letters Patent No. 452,328, dated May 12, 1891.

Application filed September 25, 1890. Serial No. 366,158. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WRIGHT, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Looms, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention relates more especially to that kind of looms having shedding and shuttle-box-operating mechanism similar to that described in Letters Patent No. 425,843, heretofore granted to me.

One object of my present invention is to afford a simple and efficient means for relieving the parts of the shedding mechanism from strains, and to stop the loom to prevent damage to the shedding harness or shuttle-box-operating mechanism in case any part of said mechanism becomes caught or fails to perform its proper action.

Another object is to provide a convenient system of shipper connections adapted for operation either by hand or by the automatic stop mechanism.

Another object is to provide a convenient means for simultaneously elevating all of the vibrator-bars for throwing their gears into mesh with the cylinder-gear, so that the mechanism can be given partial rotation forward or backward to bring all the jacks even with each other, and thus close the shed to facilitate repairing break-outs of the warps or for any other purpose when desired.

Another object is to provide the retractor or unlocking bar with an adjustable engaging-plate adapted for releasing the dogs when the loom is stopped by movement of said plate, if desired.

These objects I attain by mechanism the nature and operation of which are shown and described, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a rear view of such parts of a loom as will illustrate features of my present invention. Fig. 2 is a transverse section of the shaft that operates the loom-head at line *x x*, Fig. 1. Fig. 3 is a transverse section at line *w w*, Fig. 1. Fig. 4 is a side view of the throw-off lever. Fig. 5 is an end view showing portions of the shedding mechanism and the shipper connections, the pattern-chains being omitted. Fig. 6 shows in plan and side detail the shipper-rod joint. Fig. 7 shows in detail the arrangement of the vibrator-bar, crank-gear, cylinder-gear, dog, and vibrator fall-stop or lift-bar. Fig. 8 shows a front view of the retractor with adjustable engaging-plates. Fig. 9 is a detail top view showing the arrangement of the vibrator fall stop or lift and one of the vibrator-bars and its connections. Fig. 10 is a detail sectional view showing the flanged sleeve, hub, and collar with the relieving-pin and throw-off stud.

Referring to parts, A indicates the frame; B, the swing-jacks; C, the cylinder-gear; D, the vibrator-bars; E, the connecting-bars; F, the crank-gears; G, the head-operating shaft, and G′ the beveled gears that connect said operating-shaft with the axle C′ of the cylinder-gear.

The above-named parts can be constructed and relatively arranged substantially as set forth in Letters Patent No. 425,843, heretofore granted me on April 15, 1890, and therefore need not be herein more particularly described; but features of improvement that pertain to the present invention will be explained as employed in connection therewith.

That part of my invention which has reference to the relief and throw-off devices comprises means substantially such as shown in Figs. 1, 2, 5, and 10. The clutch-ring *h*, that is moved by the fork *h′* and which connects with the hub of the driving-gear H, is arranged upon a sleeve J and connected therewith by a spline, so as to be longitudinally movable but not rotatable thereon. The sleeve runs loose upon the shaft G and is flanged at its upper end, as shown at *j*. A flanged hub K is tightly keyed or secured by set-screws to the shaft G adjacent to the end of the sleeve, and above said hub K there is a flanged collar L, that slides freely on the shaft G, while passing through or supported by said hub K is a movable stud or piece K′, one end of which rests within an inclined groove J^2 in the top end of the sleeve J, while

its other end supports the sliding collar L. The flange *j* of the sleeve J and the flange k^3 of the hub K stand adjacent to each other and are perforated to receive a pin P, (one or more, if desired,) which is inserted therethrough, as indicated, for making the power connection between the clutch and shaft and transmitting the rotative force for driving the shedding mechanism or loom-head, while the clutch *h* can be thrown into and out of action, as desired, without interfering with the pin, the action being the same as with a simple clutch, so long as the pin P remains intact. Said pin P is of such size that it will transmit the requisite power for the ordinary working of the loom, but not so large but that it will give way or become sheared off in the event of any undue or severe resistance or accidental catch in the action of the shedding mechanism. The flanges *j* and k^2 are best provided with hardened-steel dies P^2, fitted therein (see Fig. 10) for receiving the pin P, and which facilitate the shearing off of said pin without damage to the edges of the opening wherein said pin is inserted. The pin can be an ordinary split pin or a piece of bent wire, so as not to be liable to escape from position. An angle-lever M, fulcrumed on an arm of the frame at M′, engages with the sliding collar L by its end resting on the collar-flange or in other suitable manner. Said lever has its opposite arm connected by a rod M^2 with an arm or lever *m*, that is fixed on the end of the rocker-shaft N, by which the shipper is operated.

Pivoted on the forward part of the frame is a hand-lever n^6, which engages with the end of lever *m* by suitable gear-teeth. The shaft N extends across the breast of the loom and is provided with a crank or arm N′ for working the shipper-rod N^2 and clutch V, which latter can be of the usual well-known kind. The connection between the arm N′ and rod N^2, I construct as shown in Figs. 5 and 6. A pair of knuckle-joint arms *n* n^3 connect the rod N^2 with a stud n^4, that is fixed in the frame A, and a link or bar N^5 connects the central hinging point of said knuckle-joint with the crank N′ of the rocker-shaft N, so that movement of said shaft straightens or bends the knuckle-joints, operates the rod N^2, and throws the driving-clutch V into or out of engagement, as required. The rocker-shaft N and shipper are thus conveniently operative either by means of the hand-lever n^6 or by the throw-off of the relief mechanism.

In case of any derangement or failure to properly operate in the vibrators and shedding mechanism, which would occasion a stoppage in the action thereof and be liable to break the machinery, the strain is relieved by the breaking or shearing off of the pin P, and when such shearing action takes place the shaft G is released and stops, while the sleeve K continues to revolve and the inclined surface J^2 forces upward the stud K′, which in turn lifts the collar L and end of the angle-lever M, causing a backward draft upon the rod M^2, which works the rocker-shaft and shipper mechanism, and thus throws off the clutch and immediately stops the entire loom.

I am aware that a relief and throw-off device, in combination with the head-operating shaft in a loom, has been described in Letters Patent heretofore granted, but of a construction and manner of operation essentially different from that herein specified and claimed.

Another feature of my invention consists in providing beneath the outer end of the vibrator-bars an eccentrically pivoted bar R, that extends across the space beneath the vibrators, and has its end pivots supported in suitable bearings preferably attached to the guide-bar T. (See Figs. 1, 7, and 9.) Said bar R is provided with an outwardly-extending arm *r*, by depressing which the inner edge or eccentric portion of the bar is turned upward beneath the ends of the vibrator-bars, thereby simultaneously lifting all of said vibrator-bars so as to bring their crank-gears F into engagement with the cylinder-gear C. Then by turning said cylinder-gear a quarter-revolution by means of the hand-crank O all of the jacks B and harnesses are brought into line, or even with each other, so as to close the shed to facilitate repairs in any breakdown of the warps, or for any other purpose, as desired. By returning said eccentric-bar to its normal position the vibrator-bars are immediately again thrown onto the control of the pattern-chain D^2, which is of well-known kind and operation. The eccentrically-pivoted bar serves as a fall-stop for the end of the vibrator-bars and also as a lifter for simultaneously elevating all of the vibrators into engagement. In the present instance, and preferably, two of these lifting fall-stop bars are employed, one for the vibrators, which control the harness-jacks, and one for the vibrators that control the shuttle-box-actuating jacks. The guide-bar T is pivoted at its ends in the frame A, so as to swing outward and downward to facilitate removal of the vibrator-bars, and is held in upright position by bolts *a*, that connect its upper part with the frame, substantially as described in my previous patent.

The dogs I for locking the vibrator or crank-gears F are made substantially as indicated in Fig. 7. The dog slides longitudinally on the vibrator-bar and is provided with a spring *i*, the ends of which are secured to the projecting ears of the dog, and the center of said spring is made with a downward point or curve adapted to engage in a notch formed in the upper side of the vibrator-bar, as illustrated, whereby said dog is retained when in normal position.

The retractor 8 is provided on its shaft with upwardly-projecting ears 9, and the actuating-arms 10, that work in connection with the cams *c* on the cylinder-gear axle, are arranged to slip over the axle or shaft of the retractor and have backwardly-projecting slotted arms

that respectively match against and are bolted to the ears 9 on the retractor-shaft, as indicated, whereby the position of the arms 10 in relation to the retractor-bar can be conveniently adjusted to bring the engaging dogs of the retractor-bar accurately into place in relation to the notches of the dogs.

The retractor-bar, in accordance with my present invention, is provided with a movable engaging plate 11 along the face thereof, which plate is provided with a series of inclined slots, through which the attaching bolts or screws are arranged, as at 12, so that longitudinal movement of said plate will raise it from engagement with the dogs. This movable plate 11 facilitates the removal of any of the vibrator bars and dogs from the loom, since it can readily be raised from engaging position. Longitudinal movement of the engaging plate in opposite direction lowers it to its normal position. The plate is best provided with a suitable grip-handle and locking device 13 to facilitate moving it and for retaining it at normal position.

The movable engaging-plate 11 for that part 18 of the retractor that controls the dogs of the shuttle-box-operating mechanism can be made as shown at the right in Fig. 8, viz: with an upright slot and set-screw 15 for affording adjustment instead of the diagonal slots. The part 18 of the retractor, which controls the shuttle-box-operating mechanism, is fitted as a sleeve or auxiliary upon the axle of the main retractor 8, and is supported thereon in a manner to have independent movement, the same being provided with arms 10, that engage auxiliary cams on the cylinder-gear axle for effecting action of said auxiliary retractor independently of the main retractor that controls the dogs of the shedding mechanism.

The arrangement of the harnesses with the swing-jacks, the pattern-chain D^2, its rotator, and operating-gearing for intermittently advancing the same can be of well-known kind and the general operation of such mechanism similar to that heretofore employed.

I claim as of my invention, to be herein secured by Letters Patent—

1. The combination, with the head-operating shaft that transmits power to the shedding mechanism and its operating-gearing and clutch, of the flanged sleeve mounted loose on said shaft and supporting the clutch-ring, the flanged hub fixed on the shaft, and the pin P, arranged through the flanges of said sleeve and hub and forming the power-transmitting connection, substantially as and for the purpose set forth.

2. The combination, with the shedding mechanism, its operating-shaft, operating-gear, and clutch, of the loose sleeve J, carrying the clutch-ring *h* and provided with an inclined surface J^2, a hub fixed on said shaft adjacent to the said sleeve, having a movable stud arranged therethrough, the relief-pin P, connecting said hub and sleeve, the sliding collar mounted to slide on said shaft and supported on said movable stud, a lever, as M, one arm engaging with said sliding collar and its other arm connected by a rod, and suitable gearing with the shipper-actuating mechanism of the loom, substantially as and for the purpose described.

3. The combination, with the head-operating shaft and shedding mechanism in a loom, of the flanged sleeve J, the flanged hub K and relief-pin P, and the cutters or dies P^2, inserted in said flanges for supporting said pin.

4. The combination, with the frame, cylinder-gear, vibrator-bars, and vibrator-gears, of the fall-stop bar disposed beneath the outer ends of said vibrator-bars and eccentrically journaled at the ends in bearings on the frame and provided with the outwardly-projecting arm *r*, substantially as shown, and for the purpose set forth.

5. In combination with the vibrator-bar provided with a notch in the edge thereof and a gear-locking dog mounted to slide on said vibrator-bar, of the spring *i*, supported in the ears of the dogs and having the downward point or bend that engages said notch in the vibrator-bar, substantially as set forth.

6. The combination, with the retractor-shaft provided with ears 9, the cylinder-gear axle C′, and cams *c*, arranged thereon, of adjustable retractor-actuating arms 10, fitted onto the retractor-shaft and connected with said ears, substantially as and for the purpose set forth.

7. The combination of the movable engaging plate or edge-piece 11 with the retractor 8 and the gear-holding dogs I, substantially as and for the purpose set forth.

8. In combination with the vibrators, dogs, vibrator-gears, and cylinder-gear in a loom constructed substantially as described, the retractor having the auxiliary part 18 for the shuttle-box-operating mechanism arranged as a sleeve and supported upon the axle of the main retractor, the auxiliary series of cams and actuating-arms connected therewith, whereby said auxiliary part of the retractor is operated independently of the operation of the main part of the retractor, substantially as set forth.

9. The combination, with the driving-pulley clutch V, shipper-rod N^2, and rocker-shaft N, mounted in the breast-frame in a loom, of a crank N′, fixed on the end of said rocker-shaft, the stud n^4, fixed to the frame, knuckle-joint arms *n* and n^3, connecting said shipper-rod with said stud, the link N^5, connecting the center point of said knuckle-joint arms with said rocker-shaft crank, and the actuating-lever n^6 for imparting movement to said rocker-shaft, substantially as shown and described.

Witness my hand this 19th day of September, A. D. 1890.

EDWARD WRIGHT.

Witnesses:
CHAS. H. BURLEIGH,
ELLA P. BLENUS.