(No Model.) 4 Sheets—Sheet 1.

L. RIVERS.

BLIND FINISHING MACHINE.

No. 388,447. Patented Aug. 28, 1888.

FIG. 1.

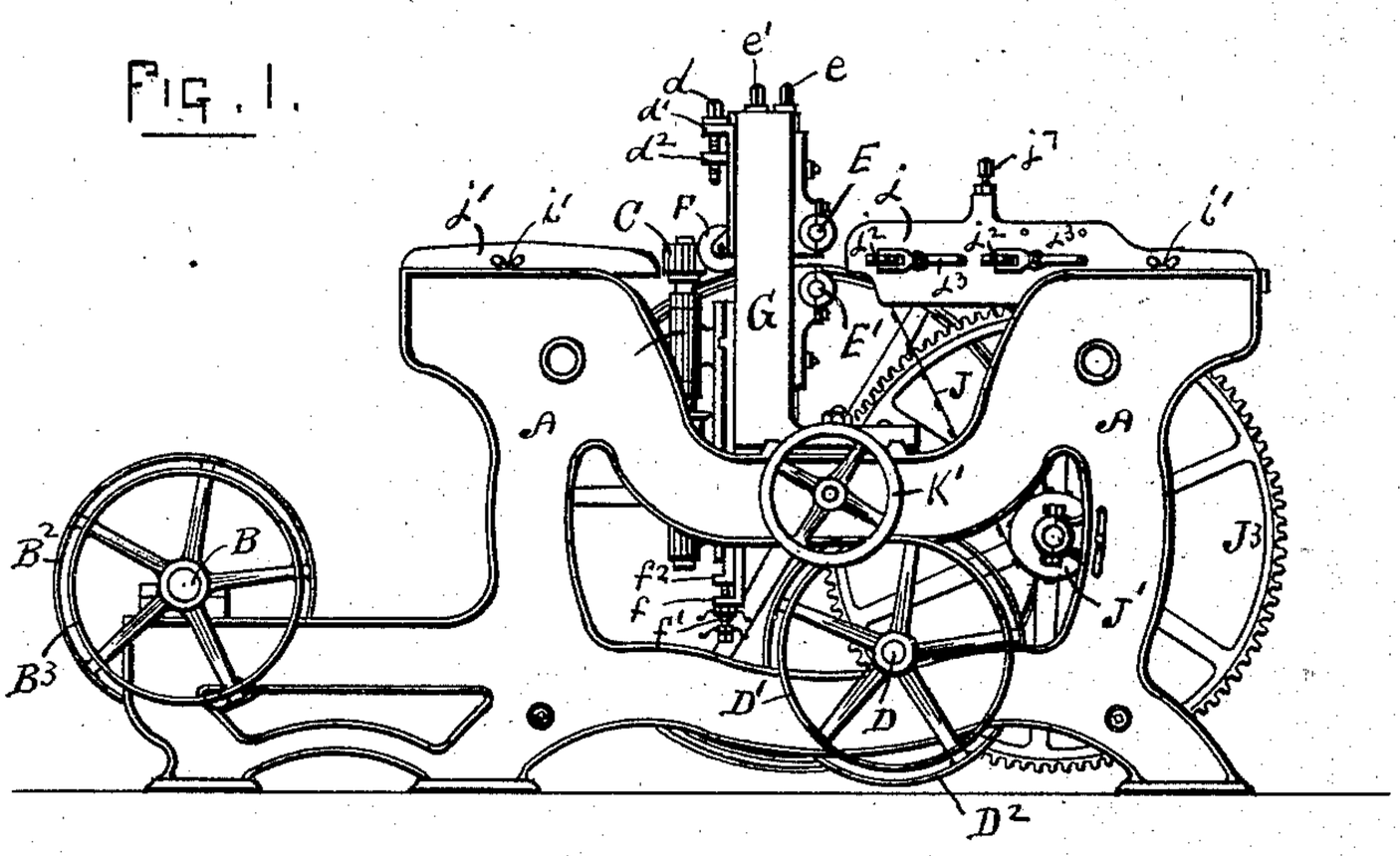
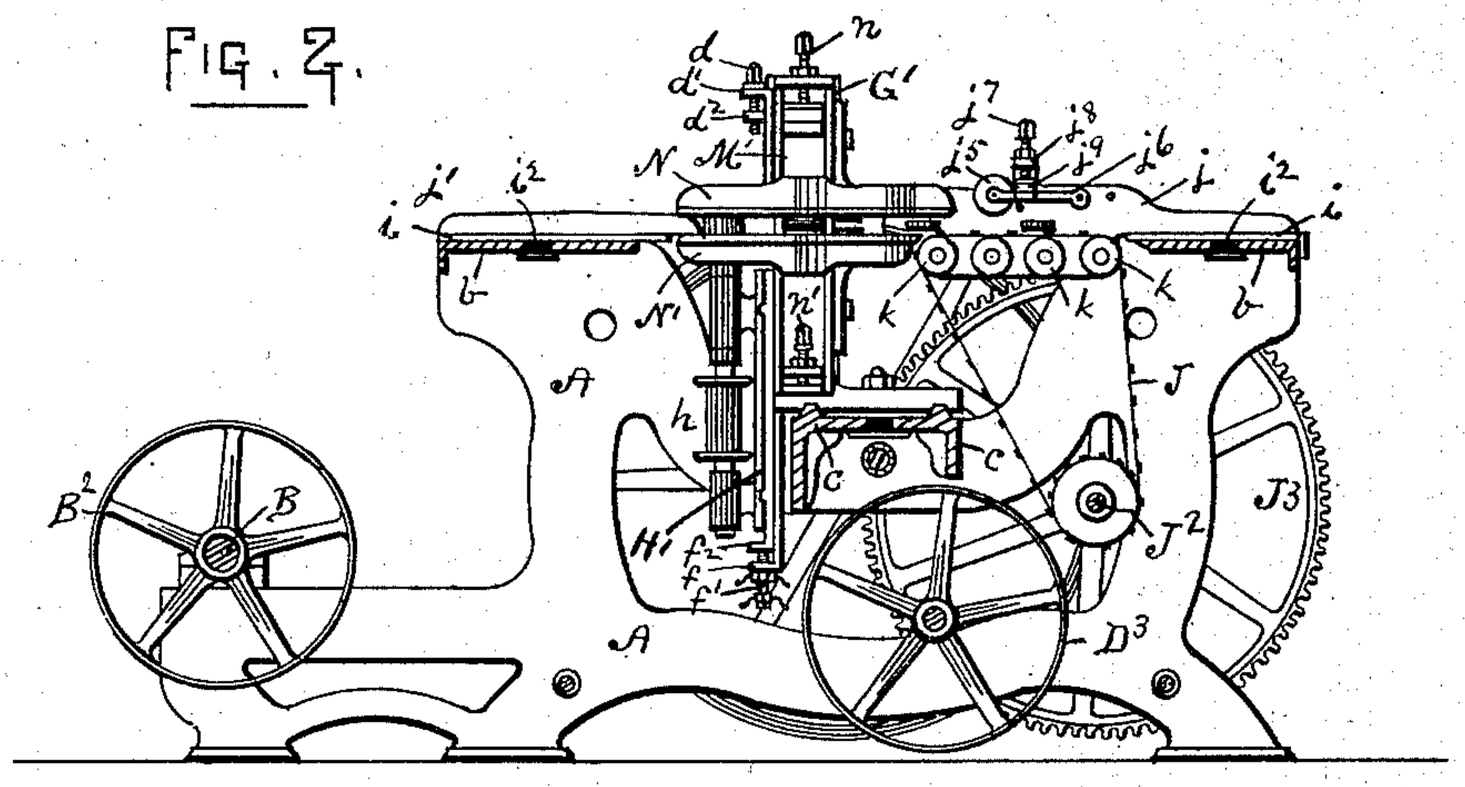


FIG. 2.



WITNESSES.

Ed. Messinger

Rufus B. Fowler.

INVENTOR.

Lewis Rivers.

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L. RIVERS.

BLIND FINISHING MACHINE.

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FIG. 3.

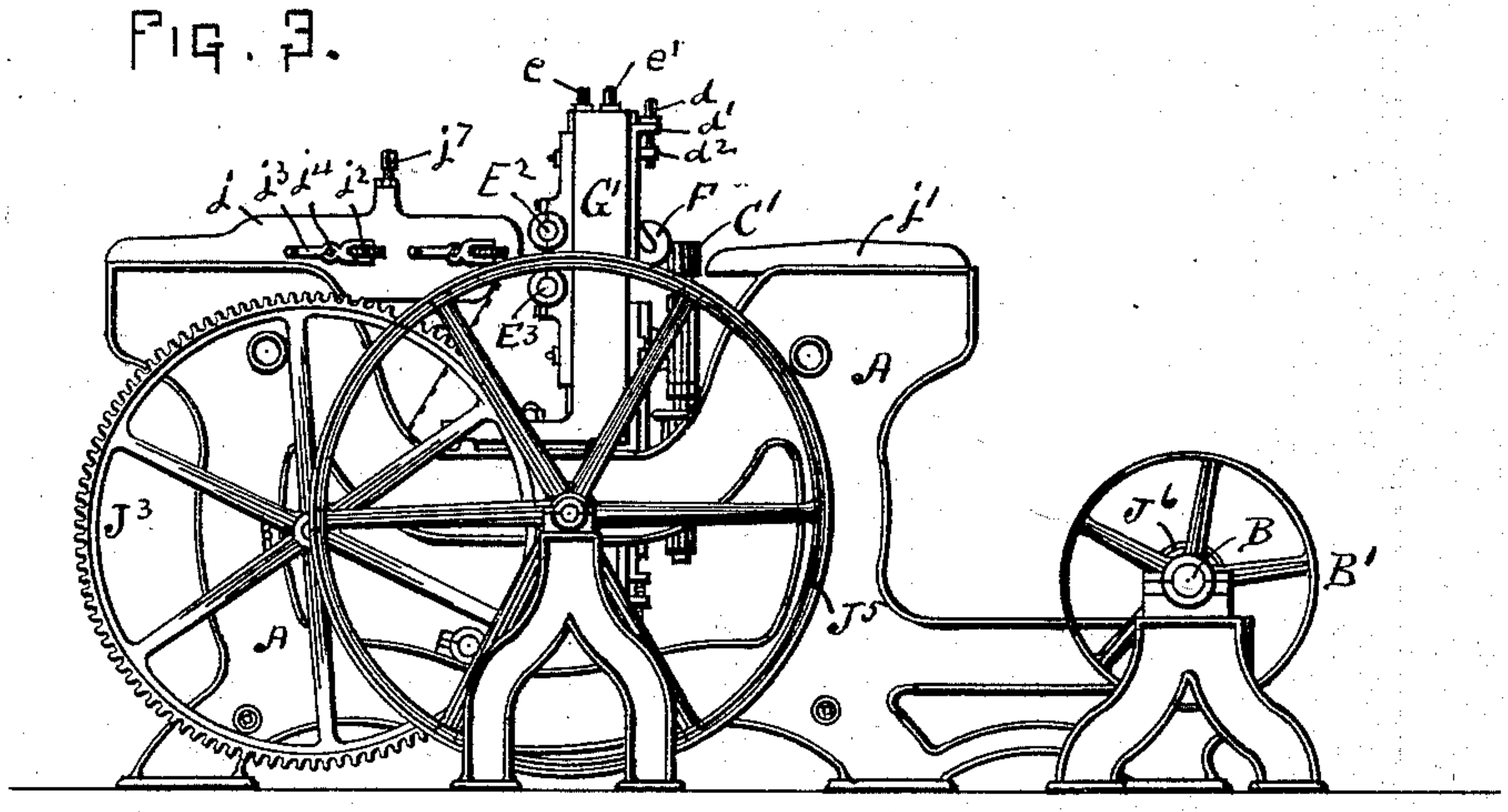
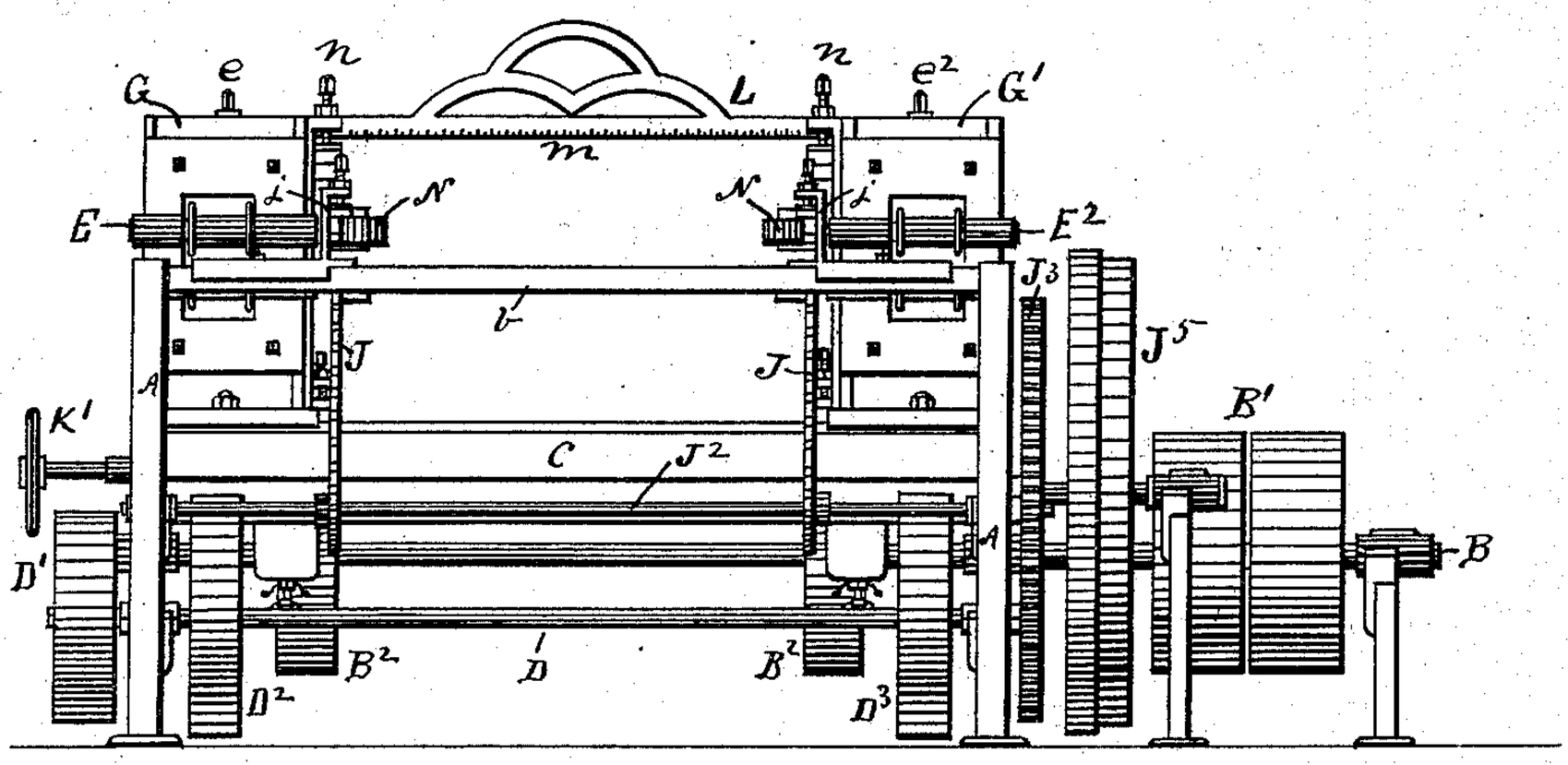


FIG. 4.



WITNESSES.

Edw. Messinger—
Rufus B. Fowler.

INVENTOR.

Lewis Rivers

(No Model.) 4 Sheets—Sheet 3.

L. RIVERS.

BLIND FINISHING MACHINE.

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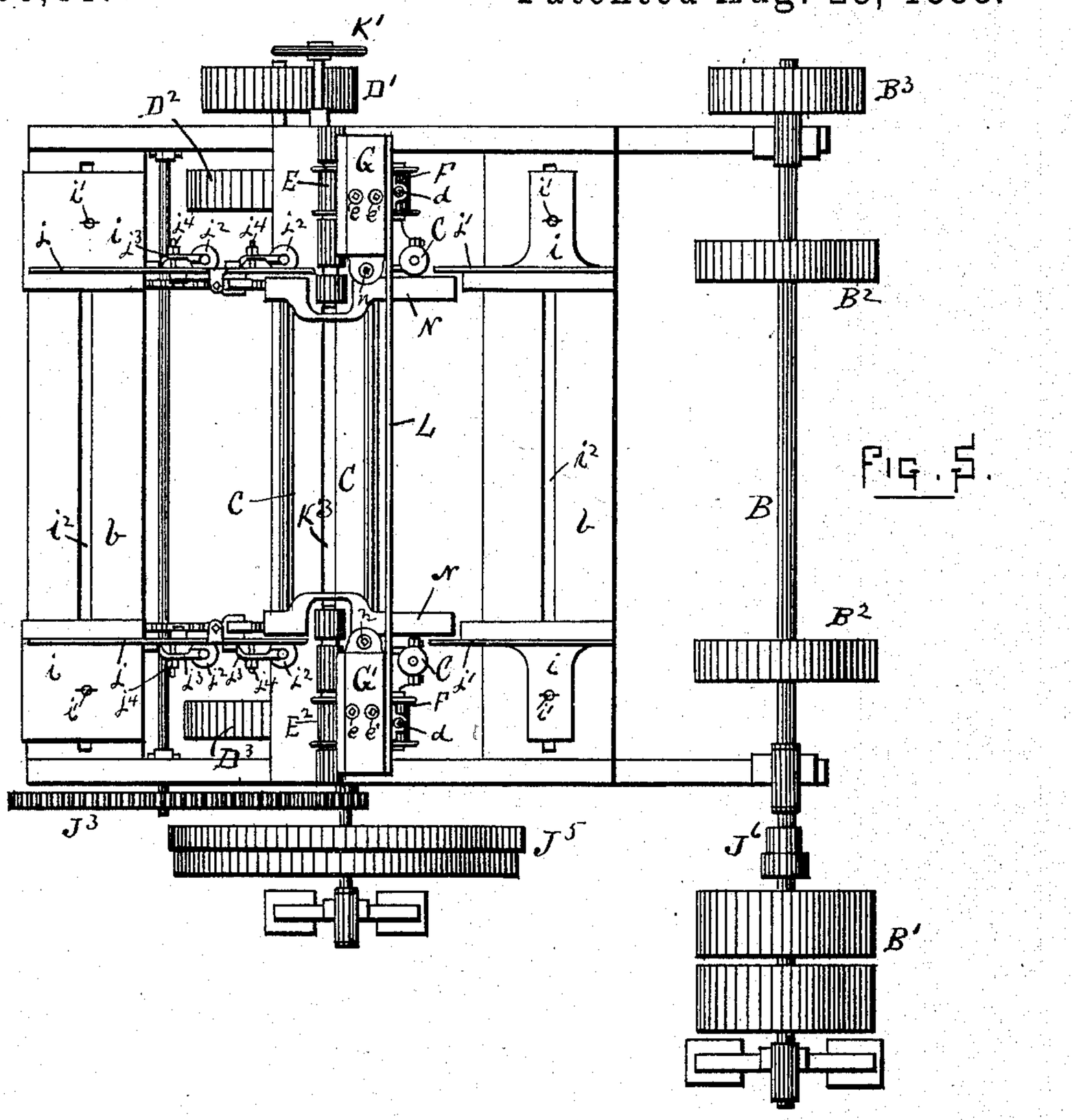
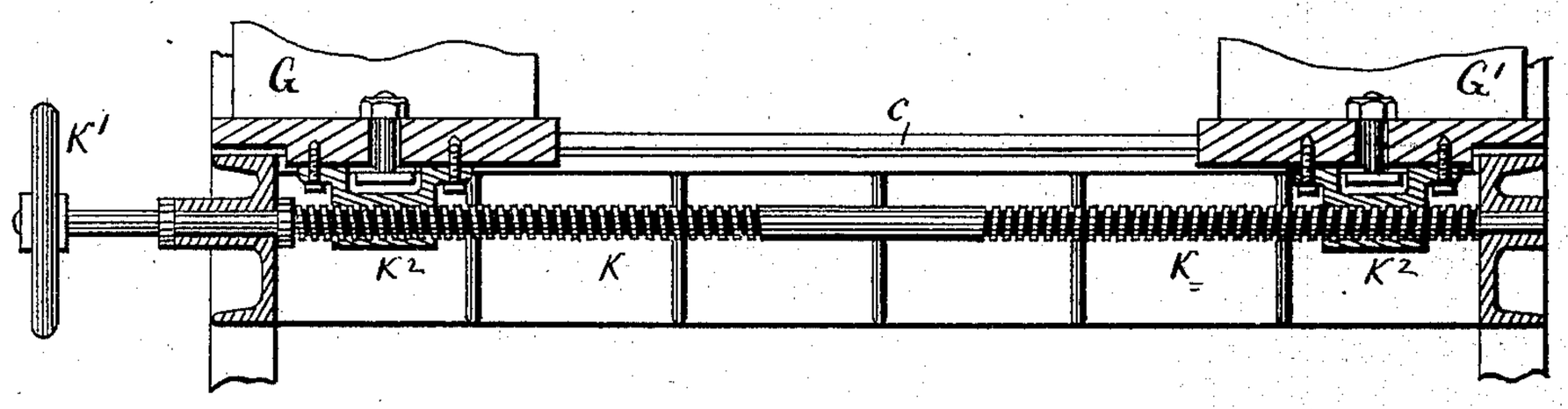


FIG. 5.

FIG. 6.



WITNESSES.

E. C. Messinger

Rufus Bennett Fowler.

INVENTOR.

Lewis Rivers

(No Model.) 4 Sheets—Sheet 4.

L. RIVERS.

BLIND FINISHING MACHINE.

No. 388,447. Patented Aug. 28, 1888.

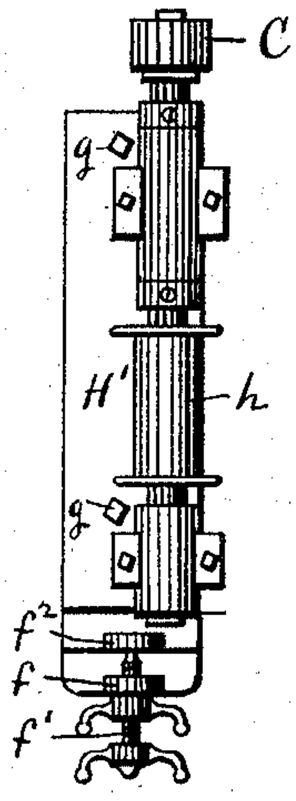


FIG. 7.

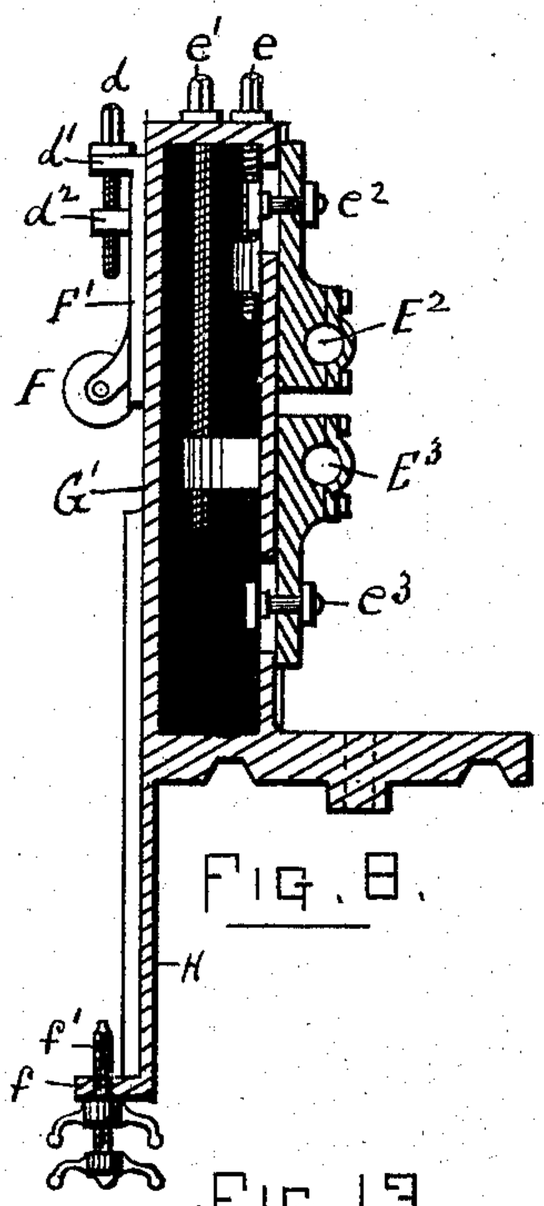


FIG. 8.

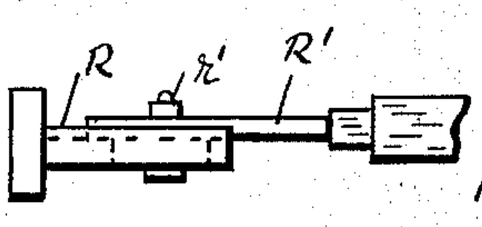


FIG. 9.

FIG. 10.

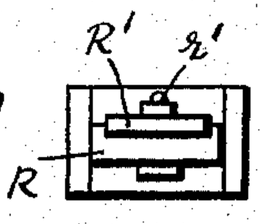


FIG. 11.

FIG. 12.

FIG. 13.

FIG. 14.

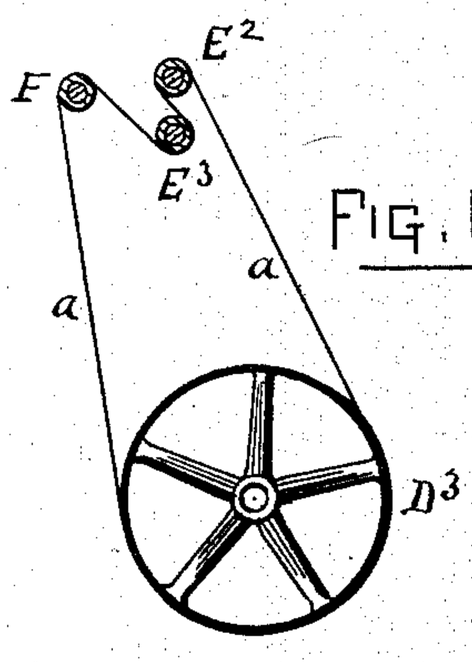


FIG. 15.

FIG. 16.

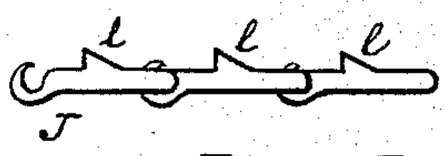


FIG. 17.

WITNESSES.

Edw. Messenger

Rufus B. Fowler

INVENTOR.

Lewis Rivers.

UNITED STATES PATENT OFFICE.

LEWIS RIVERS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ADAM CREELMAN, OF SAME PLACE.

BLIND-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 388,447, dated August 28, 1888.

Application filed July 27, 1885. Serial No. 172,823. (No model.)

To all whom it may concern:

Be it known that I, LEWIS RIVERS, 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 Blind-Finishing Machines, of which the following is a specification, giving a full, clear, and exact statement of the construction and operation of the same, and of the several features of my invention.

My improved blind-machine is designed to form the tenons upon the "rails," and also to finish the surfaces of both "styles" when the frame of the blind has been put together; and my invention consists in the several features, as hereinafter enumerated.

The accompanying drawings represent a machine embodying my invention, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a vertical sectional view of the same. Fig. 3 is an elevation of the side opposite that shown in Fig. 1. Fig. 4 is an end view. Fig. 5 is a plan view. Fig. 6 is a sectional view of a part of the machine, illustrating the screw for changing the distance between the "heads." Fig. 7 is a detached view of one of the vertical cutters. Fig. 8 is a sectional view showing devices for raising and lowering the horizontal cutters and the pulley for tightening the belt. Figs. 9, 10, and 11 are views of the side guides, against which the ends of the tenon rest as they pass beneath the horizontal cutters. Fig. 12 is a detached view of the "feed" chain and stack or vertical guides for holding the rails to be operated upon. Fig. 13 is an enlarged view of one side of the "stack." Figs. 14 and 15 are respectively top and edge views of the same. Fig. 16 illustrates the method of driving the horizontal cutters, and Fig. 17 is a portion of the feed-chain.

Similar letters refer to similar parts in the several views.

A A denote the frame-work forming the sides of the machine, which are extended to support the counter-shaft B. Upon the counter-shaft, which receives motion by means of the pulley B′, are the belt-pulleys B^2, imparting rotary motion to the two vertical cutters C C′, and a belt-pulley, B^3, which drives the transverse shaft D through a pulley, D′. Upon the shaft D are also two other pulleys, D^2 D^3, each of which imparts rotary motion by means of a single belt, *a*, to the upper and lower horizontal cutters, the pulley D^2 driving the cutter-spindles E E′, and the pulley D^3 driving the cutter-spindles E^2 and E^3. Each of the belts driving the horizontal cutters passes over a tightening-pulley, F, journaled in a sliding frame, F′.

At the top of the machine are transverse girths *b b*, forming a bed or table for the blind to be operated on, and at the central part of the frame is a girth, *c*, Figs. 2, 5, and 6, having ways upon its upper surface for the sliding heads G G′. The form of one of these heads is shown in section in Fig. 8, and consists of a shell having on the rear side ways for a slide, F′, carrying the tightening-pulley F, which is operated by a screw, *d*, passing through a lug, *d′*, on the head and entering a screw-threaded lug, d^2, on the slide, which enables the operator to draw the tightening-pulley upward and tighten the belt *a*, Fig. 16.

On the front side of the shell forming the head are ways carrying the sliding bearings for the horizontal cutter-spindles E^2 E^3, whose vertical position is determined by the adjusting-screws *e e′* and held by the bolts e^2 e^3. The rear side of the head is extended downward at H, and has ways for the sliding plates H′, upon which the vertical cutter-spindles are journaled.

A lug, *f*, at the lower end of H carries an adjusting-screw, *f′*, which, acting against a lug, f^2, on the plates H′, determines the vertical position of the upright cutters C C′, which are then held in position by bolts *g g*, entering slots in the plate H′. The upright cutter-spindles are driven by quarter-twist belts from the pulleys B^2, running on the flange-pulleys *h h′*. Upon the top girths *b b* are placed, the plates *i* held in position by bolts *i′* entering slots i^2 in the girths, and to the plates *i* are attached the side guides, *j j′*. Those upon the front side, *j*, have the friction-rolls j^2 with vertical axes journaled in elastic arms j^3, attached to the guides *j*, and screws j^4, passing through the elastic arms, serve to bring the edges of the friction-rolls through slots in the guides *j*. Near the upper edges of the guides *j* are fric-

tion-rolls j^5 with horizontal axes journaled in arms j^6, pivoted to the inside of the guides j. The rolls j^5 are held in the proper vertical position by screws j^7, carried in lugs j^8, to press upon the work as it is being fed to the cutters.

Between the bearings of the roll j^5 and the screws j^6 are placed blocks of rubber j^9, or other elastic material, to allow for slight inequalities in the surface of the work. Upon a series of studs placed in the same horizontal plane along the inner sides of the guides j' are rolls k, over which the feed-chain J passes, driven by sprocket-wheels J' J' on shaft J^2, which is driven through the gear J^3, pinion J^4, and cone-pulley J^5 and J^6 from the counter-shaft B, by which the speed of the counter-shaft is reduced and a slow speed given to the feed-chain.

The feed-chain J has upon its links teeth l, which are made to engage the work, as they pass over the rolls k, and carry it forward toward the revolving cutters. The teeth l are triangular in shape, as shown in Fig. 17, the forward end of the tooth being made at right angles to the link in order to engage the work and carry it toward the cutters, while the upper surface of the tooth is inclined to allow the work to be pushed over the teeth in the direction of the motion of the chain. The shaft J^2 is held in bearings which are attached to the frame A by bolts passing through slots in the frame to allow the shaft J^2 to be carried downward and the feed-chain tightened.

The heads G G', carrying the vertical and horizontal cutters, may be moved transversely to the frame of the machine along ways on the upper side of the central girth, c, by means of a shaft having a right and left screw, K K, journaled in the frame and operated by the hand-wheel K'; or, instead of the right and left hand screw, by which the heads are simultaneously drawn toward or away from the center of the machine, one of the heads G G' may be held stationary and the other only moved by the screw. The screw K K works in nuts K^2 K^2, having arms extending through a slot, K^3, in the central girth, c, which are attached by nuts and T-bolts to the heads G G', and by which the heads are tightened and held in place on the girth c. An index-bar, L, having graduation m along its edge, is attached to both the heads G G', and serves to prevent any vibration that might occur from the rapid motion of the cutters, and by loosening the bar L upon either of the heads, as their position is changed along the girth c, the graduated edge m will indicate the distance between the horizontal cutters. The inner sides of the heads G G' have dovetailed ways M, in which sliding plates M' are fitted, carrying the upper pressure-bar, N, which is adjusted vertically by a screw, n, and a lower pressure-bar, N', which is vertically adjusted by a screw, n'.

The above described arrangement of working parts is adapted to finish the blind after it is put together by dressing the upper and under surfaces of the "style" by the horizontal cutters on the spindles E, E', E^2, and E^3, and the edges of the style by the vertical cutters C C', the blind being carried forward by the action of the feed-chain J. The blind is held down by the upper friction-rolls, j^5, and passes between the front side guides, j, the side friction-rolls, j^2, and the rear side guides, j', each blind as it leaves the chain being carried on and out by the next blind following it, and each blind being subjected to the action of all the six cutters as it passes through the machine. By throwing the belts from the pulleys D^2 D^3 and removing the cutters C C' out of the way of the work, the blind-rails may also have their tenons cut on the same machine by the action of suitably-formed cutters on the spindles E, E', E^2, and E^3. When the machine is used for cutting tenons on the rails, however, I remove the upper friction-rolls, j^5, and I attach to the side guides vertical plates O—one at each side of the machine—connected by a rod, o. Each of the plates has a rib, P, held by screws p in slots p', so that the rib P may be adjusted vertically, and a rib, P', held by screws p^2 in slots p^3, so that the rib P' may be adjusted laterally and the distance between the ribs P and P' increased or diminished. The ends of the pieces to form the rails are placed between the ribs P P', and one above another, and as the bottom piece in the stack is carried forward by the action of the prongs l another piece will fall into its place to be carried forward in like manner, the pieces being fed at the top of the pile by the attendant.

In the dovetailed ways M, on the inside of the heads G G', I fasten angle-plates R by screws r, Fig. 9. To the angle-plates R are attached plates R', held by screws r' passing through slots r^2 in the plates R', so that they may be adjusted laterally. These plates R' serve as side guides, against which the ends of the tenons rest as they pass through the machine.

I am aware that wood-working machines have been made with an endless chain by which the work is fed to the cutters; also, that horizontal and vertical cutters held in a movable head have been used. Such I do not claim, broadly. Neither do I claim the use of a tightening-pulley in combination with two parallel revolving cutter-spindles driven by a single driving-pulley.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the movable heads G, carrying a series of revolving cutters, and an endless chain by which the work is fed to said cutters, said chain being moved in a fixed way, of the side guides, j and j', attached to plates i, said plates i being laterally adjustable to correspond with the position of said movable heads, substantially as described.

2. The combination, with the movable heads G, carrying a series of revolving cutters, and an endless chain moved in a fixed way between said heads, of the side guides, j j', laterally adjustable to correspond with the

position of the movable heads, side friction-rolls, j^2, journaled in arms j^3, top friction-rolls, j^5, journaled in arms j^6, said arms j^3 j^6 being attached to the side guides, as described.

3. The combination of a fixed chainway, an endless chain moving in said way, by which the work is fed, a series of revolving cutters supported by a pair of movable heads, and a pair of movable heads laterally adjustable with reference to said fixed chainway, substantially as described.

4. The combination of a fixed chainway and an endless chain moving in said way, by which the work is fed, a series of revolving cutters supported by a pair of movable heads, a pair of movable heads laterally adjustable with reference to said chainway, and an actuating screw provided with a right and left hand screw-thread, whereby the movable heads are conjointly adjusted, substantially as described.

5. The combination, with a pair of horizontal cutters, of the plates M′, sliding vertically in ways, the upper and lower pressure-bars, N and N′, attached to said sliding plates, and the adjusting screws n and n', substantially as described.

6. The combination, with a pair of movable heads, G, each carrying revolving cutters and each laterally adjustable, of a graduated brace-rod, m, as and for the purpose described.

LEWIS RIVERS.

Witnesses:
RUFUS B. FOWLER,
CHARLES F. STEVENS.