

J. E. COFFIN.
BOOK-BACKING MACHINE.

No. 171,366.

Patented Dec. 21, 1875.

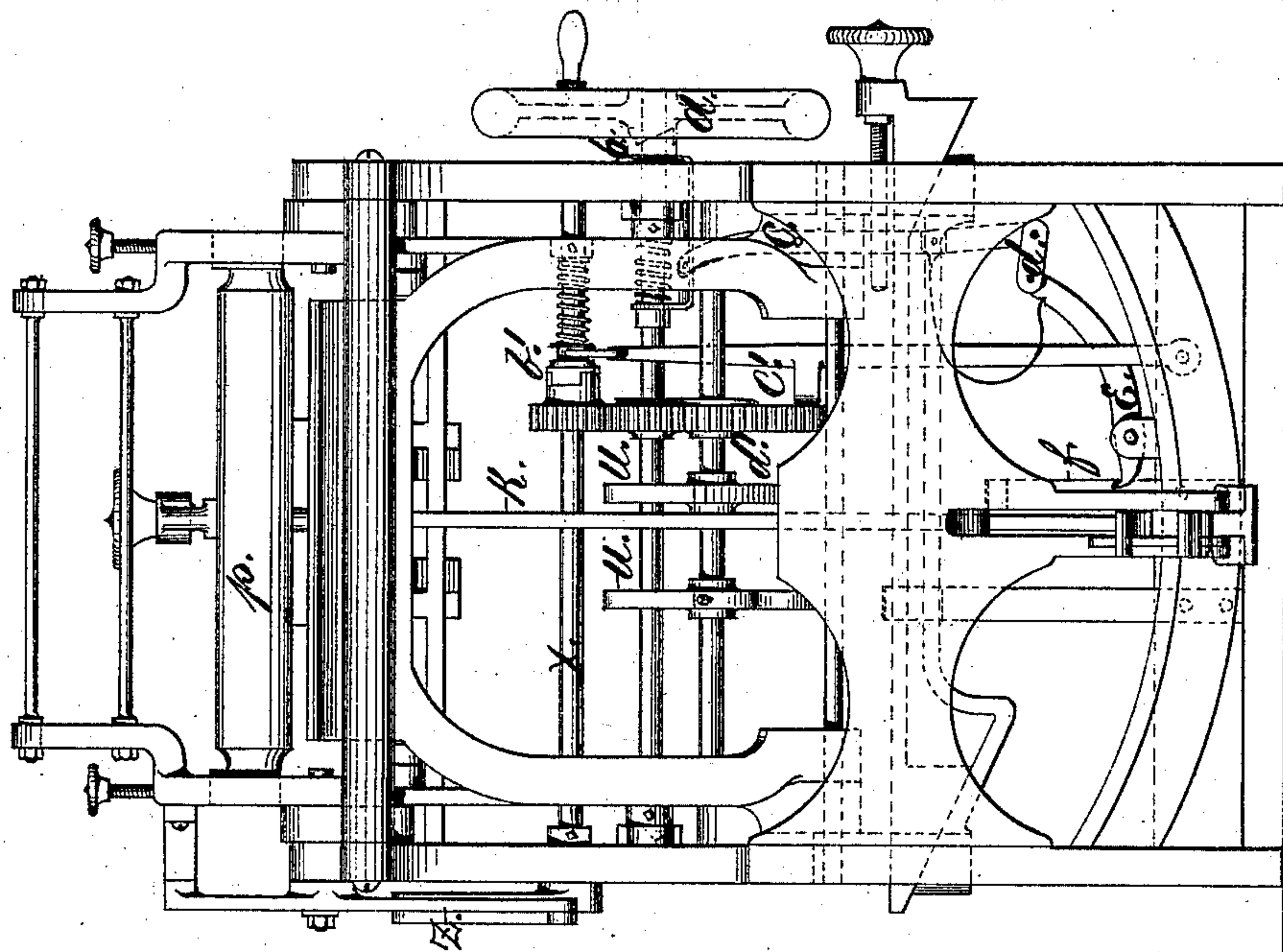


Fig. 2.

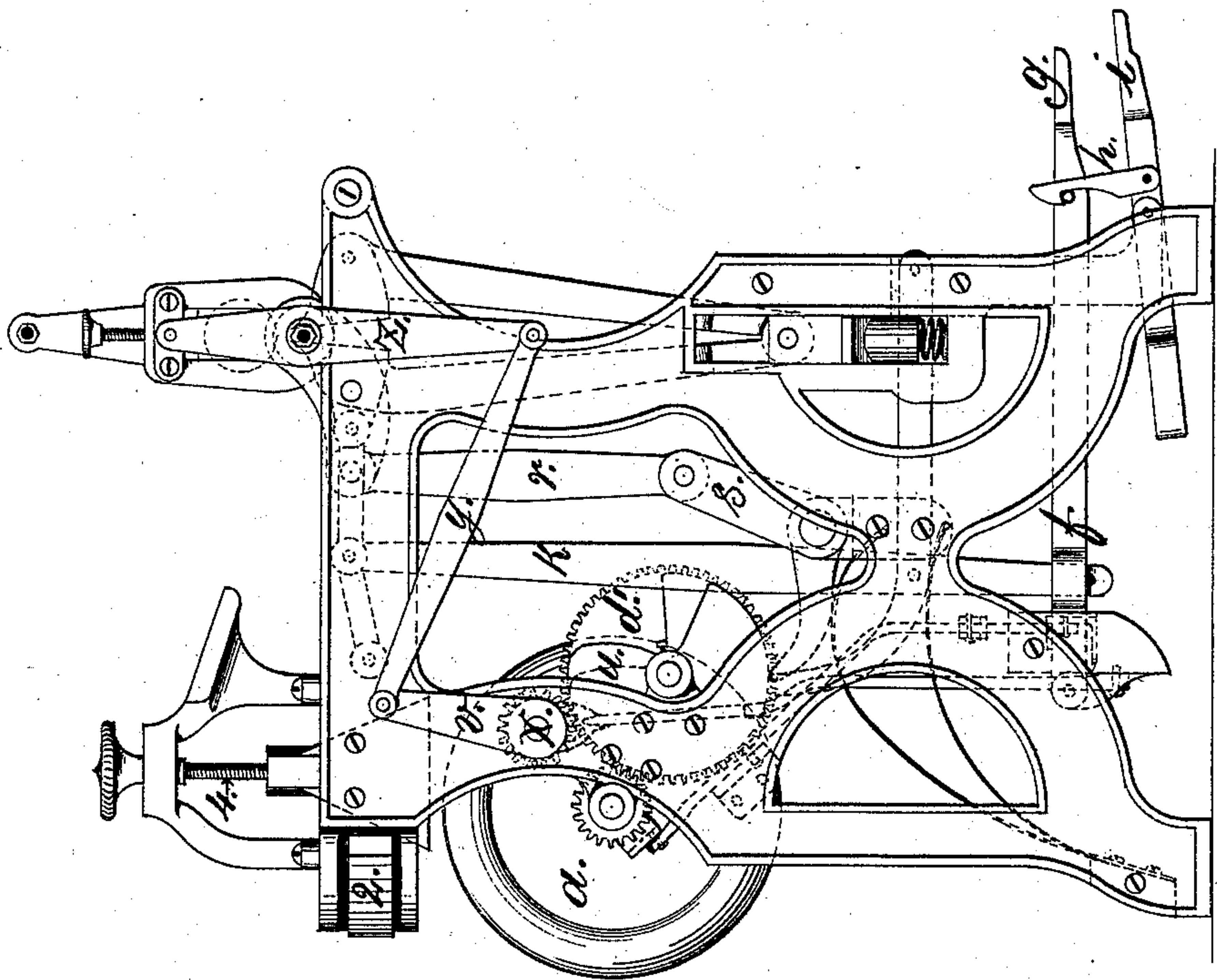


Fig. 1.

WITNESSES.

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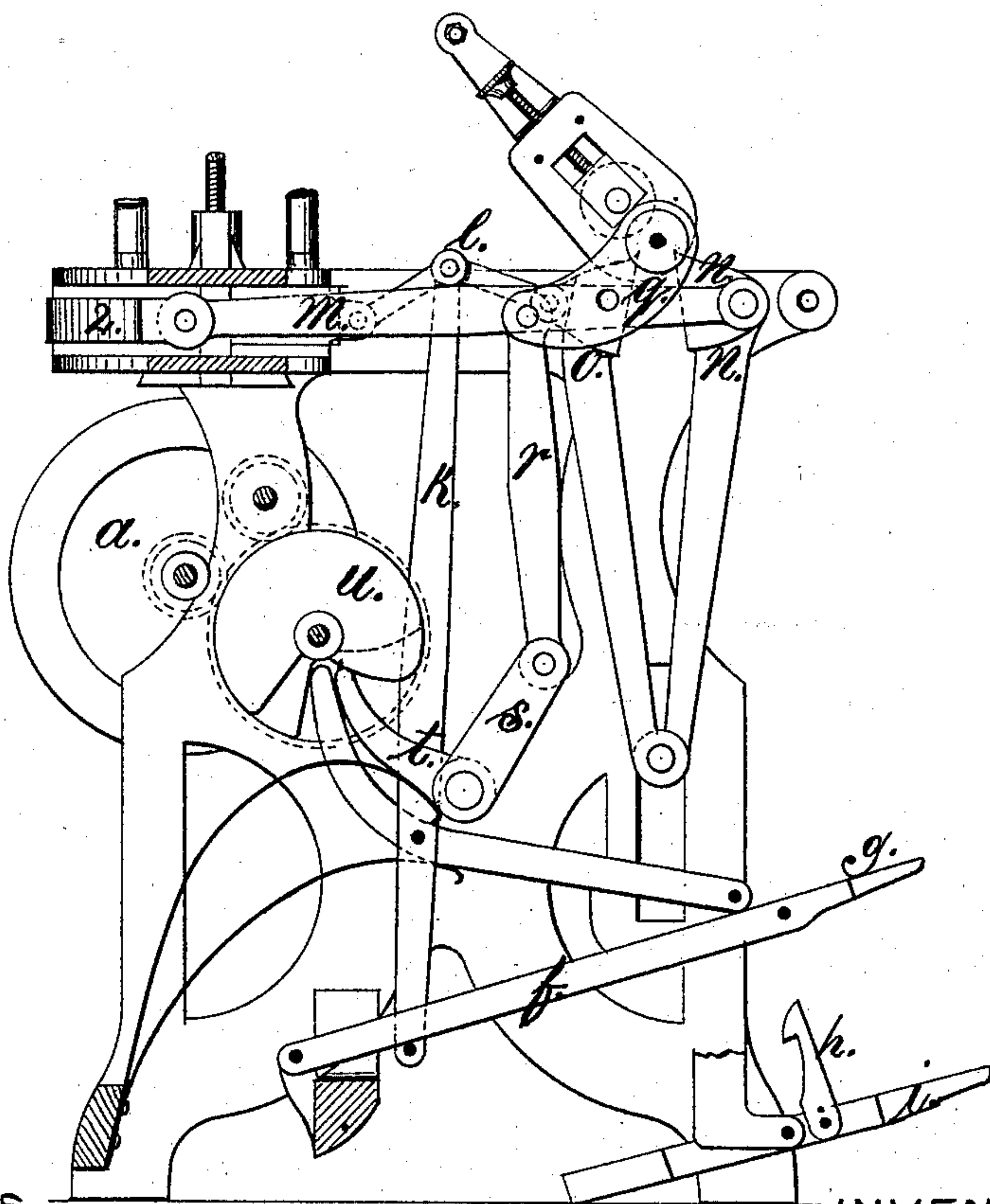
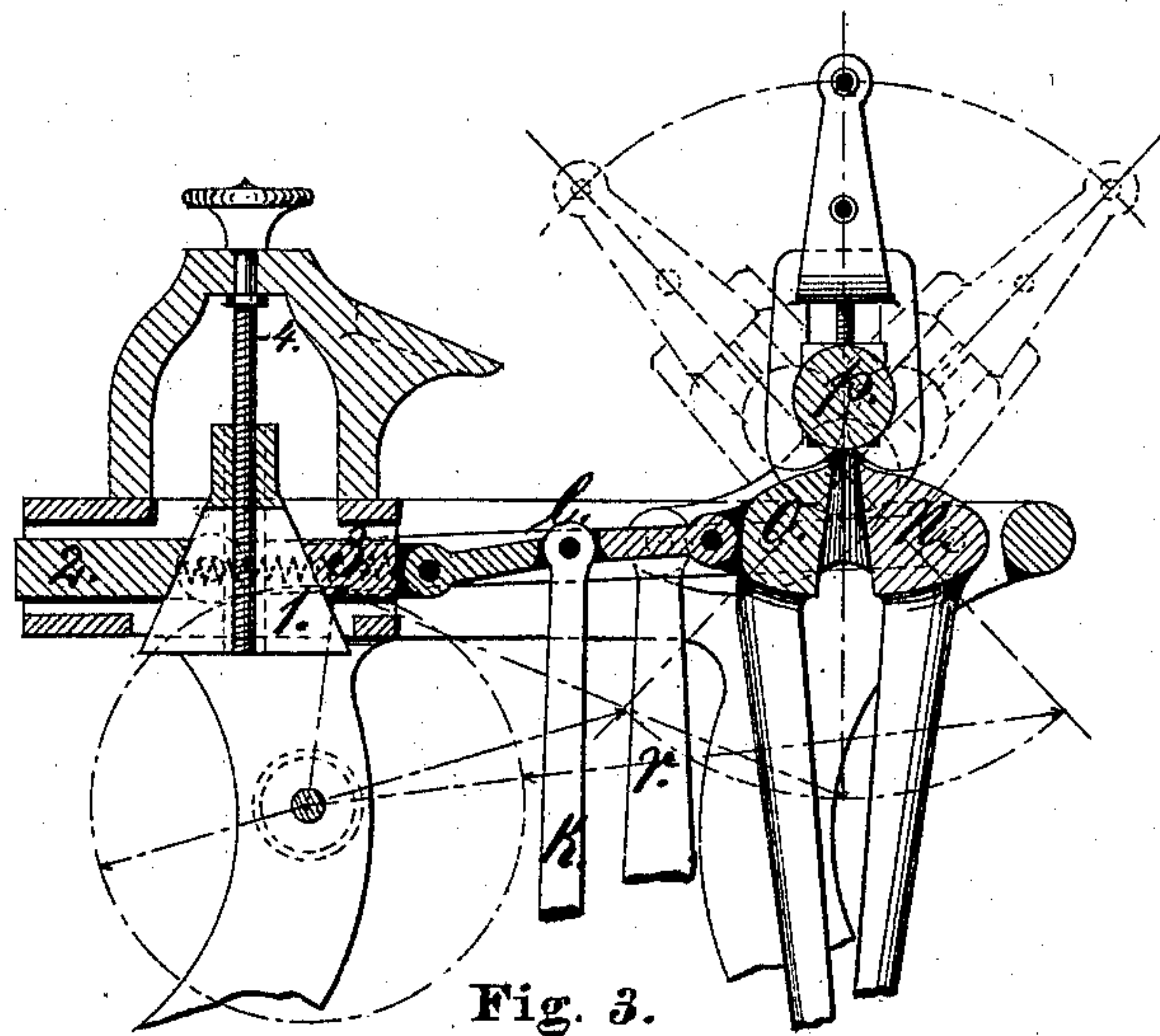
INVENTOR.

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UNITED STATES PATENT OFFICE.

JOHN E. COFFIN, OF MYSTIC RIVER, CONNECTICUT.

IMPROVEMENT IN BOOK-BACKING MACHINES.

Specification forming part of Letters Patent No. **171,366**, dated December 21, 1875; application filed September 8, 1875.

To all whom it may concern:

Be it known that I, JOHN E. COFFIN, of Mystic River, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Book-Backing Machines; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a side view of the machine. Fig. 2 is a front view of the same. Fig. 3 is a transverse section through the center of the machine, showing the roller and clamping device in section. Fig. 4 is a side view, partly in section, the frame being removed to show the working parts.

This invention consists in the application of mechanism to a book-backing machine, so that the machine may be driven by power and perform all the functions automatically, without the severe manual labor now required.

In the drawings, *a* is the main driving-wheel, by which power is applied to the machine. *b* is a clutch, operated through the levers *c*, *d*, and *e* by the lever *f*. The lever *e* hooks under a lip on the lever *f*. This lever *f* projects at the front of the machine, and is provided with a foot-tread, *g*. When this lever is depressed the lip bears upon one end of the lever *e*, and engages the clutch *b* with the wheel, thus setting the machine in motion. The lever *f* is held, when depressed, by the hook *h*, secured to the supplemental lever *i*. When the operator places his foot on this supplemental lever the hook *h* is disengaged, and the lever *f* being released, the spiral spring relieves the clutch *b* from contact with the driving-wheel, and the driving-wheel revolves without imparting motion to the machine. The lever *f*, operated by the foot-treadle *g*, not only throws the machine in and out of gear, but the lever *k* is also connected with the same and with the knuckle-jointed levers *l*, so that when the lever *f* is depressed the knuckle-jointed levers are straightened, and thus force the jaws *o* and *n* together, and firmly secure the book the back of which is to be rolled. The jaws *o* and *n* may be adjusted to suit the thickness of the book by the wedge-shaped block 1, which, by either raising or lowering the screw 4, changes the distance between the blocks 2

and 3. The jaw *n* being secured by the bars *m m* to the block 2, and the block 3 by the knuckle-jointed levers *l* to the jaw *o*, it follows that, by increasing the distance between the blocks 2 and 3, the distance between the jaws will also be increased. The jaws may also be adjusted vertically by the wedges, secured to a bar placed under the bearing of the levers, to which the jaws are secured, and which may be adjusted and secured by the screw, as is shown in Fig. 2, partly in solid and partly in broken lines.

The pressure-roller *p* is mounted in a frame secured to the cheek-pieces *q q*, hinged by pins to the side frames of the machine. This pressure-roller is pressed down onto the back of the book held by the jaws, and rolled forward and backward over the same. The cheek-pieces *q*, carrying the roller-frame, are connected by the rods or bars *r r* with the cranks *s s*, secured one at each end of the rock-shaft, to which the arm *t* is secured. This arm is operated upon by the cam *u*, which depresses the same, and the cranks *s s* and rods or bars *r r*, forming knuckle-jointed levers, force one end of the cheek-pieces upward, and thus press the roller firmly and with great power onto the back of the book, while the oscillation of the frame rolls the roller over the same.

The oscillation of the roller-frame and the forward and backward motion of the roller *p* are produced by the crank *v*, secured to the end of the shaft *x*, and connected with the arm *z*, secured to the oscillating roller-frame by the connecting-rod *y*, so that at each revolution of the shaft *x* the roller-frame makes one forward and backward oscillation.

The main driving-shaft, to which the driving-wheel *a* is connected or disconnected by the clutch *b*, is geared by a small pinion into the larger gear-wheel on the shaft carrying the cams *u u*, and another small gear provided with a clutch is secured to the shaft *x*, and also gears into the larger gear-wheel *d'* on one end of the shaft *x*. The crank *v* imparts the oscillating motion to the roller *p*, as above described. The male gear is loose on the shaft *x*, and is connected with or disconnected from the shaft by the clutch *b'*, which is operated by the shifting-rod *c'*, having a projection on the same in contact with a segmental

projecting rib placed on the side of the large gear-wheel d' , so that, during a part of its revolution, the projection on the shifting-rod c' comes in contact with the segmental rib, and thus disengages the clutch b' , when the rotation of the shaft x ceases, and consequently the oscillation of the pressure-roller p .

Having thus described the different parts of my improved book-backing machine, I will now describe the operation of the same. Either manual, steam, or other power being applied to the driving-wheel a , the same will revolve freely without imparting motion to the machine. The jaws being properly adjusted to retain the size of book the back of which is to be rolled, the operator places the book between the jaws, extending the same above the edges of the jaws a proper distance. He now places his foot on the treadle g , depressing the lever f , which forces the jaws firmly together, and secures the book, while the clutch b also engages with the driving-wheel, which now imparts its motion to the mechanism of the machine. The projection on the shifting-rod c' at this time rests on the segmental rib secured to the large gear d' , and the clutch b' is out of gear. The roller p does not roll over the back of the book, as the shaft x does not revolve, but the cam u revolves and depresses the arm or lever t , and thus presses the roller p firmly against the back of the book. As soon as the projection on the shifting-rod c' leaves the segmental rib on the gear-wheel d' the spiral spring forces the clutch b' into gear, when the shaft x revolves, as also the crank v , and thus imparts oscillating motion to the roller-frame, which rolls the roller forward and backward over the back of the book, giving to the same the proper convex shape, and producing the projection of the back on each side required for the covers. The oscillation of the roller-frame and the forward and backward motion of the roller continue until the projection on the shifting-rod c' again comes in contact with the segmental rib on the gear-wheel, when the same is forced outward, and disengages the clutch b' , thus stopping the rotation of the shaft x and the oscillation of the roller-frame. At the same moment the peculiar shape of the cam u allows the arm t to rise, and thus raise the pressure-roller p off the book. The operator now places his foot on the treadle i , forcing the hook h off the pin on the lever f , when the same is forced upward by the spring, the clutch b becomes disengaged from the driving-wheel, and the machine is stopped. The operator now removes the book, replaces the same by another, places his foot on the treadle g , and forces down the lever f , when the whole operation will be repeated.

The only labor required by the operator is

the insertion and removal of the book, and the depression and relieving of the lever f . When no power is available, unskilled labor may be used to turn the driving-wheel, and the skilled operator will be relieved from the severe labor required to move the pressure-roller forward and backward, which labor is more serious, owing to the curve through which the roller-frame is moved, than would at first seem possible.

With my improved machine, even when turned by manual labor, a great saving in cost and time is effected, and a very much larger amount of work can be performed than is possible with the older hand machine.

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

1. The combination of the driving-wheel, the clutch, and the book-holding jaws with a foot-lever and intermediate mechanism, substantially as described, whereby the machine is started and the jaws closed by one movement of the lever, and the reverse effect produced by its return movement, as set forth.

2. The combination, with the roller p , mounted in a hinged frame for inducing downward pressure, of the crank v , rod y , and arm z , substantially as described, whereby the roller is oscillated while pressed downward on the back of the book, as set forth.

3. The combination, with the revolving cam u , of the arm t , crank s , and bar r , connected with the cheek-piece q , constructed to operate so as to press the roller p against the book-back, substantially as and for the purpose described.

4. The combination, with the shifting-rod c' , of the segmental rib secured to the gear d' , and the clutch b' , arranged to operate together substantially as and for the purpose described.

5. In combination with the adjustable jaws o and n , the oscillating roller-frame secured to the cheek-pieces q , and the automatic mechanism, substantially as described, by which the roller is pressed against the back of the book, as and for the purpose set forth.

6. In a book-backing machine driven by power, the combination of the following elements: a foot-lever, by which the jaws are forced together, and the machine is set in motion; a cam, operating a combination of levers, by which the roller is forced against the back of the book held in the jaws automatically; and a rotating crank with intermediate mechanism, by which oscillating motion is imparted to the roller-frame, the whole operating together substantially as and for the purpose specified.

JOHN E. COFFIN.

Witnesses:

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L. W. MORSE, Jr.