2 Sheets—Sheet 1.

H. S. SMITH.

MOLDING-MACHINE.

No. 177,433. Patented May 16, 1876.

Fig. 1.

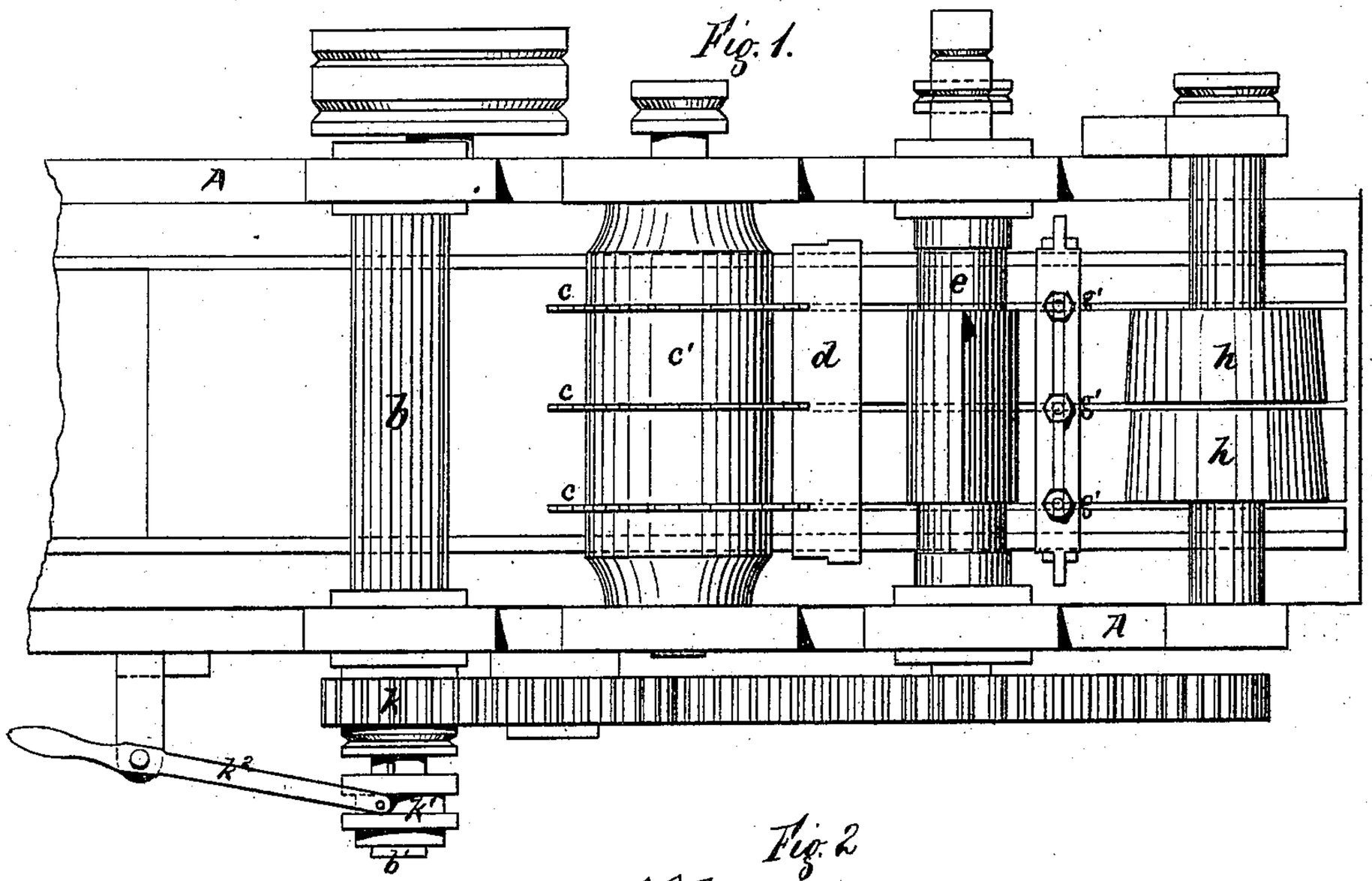
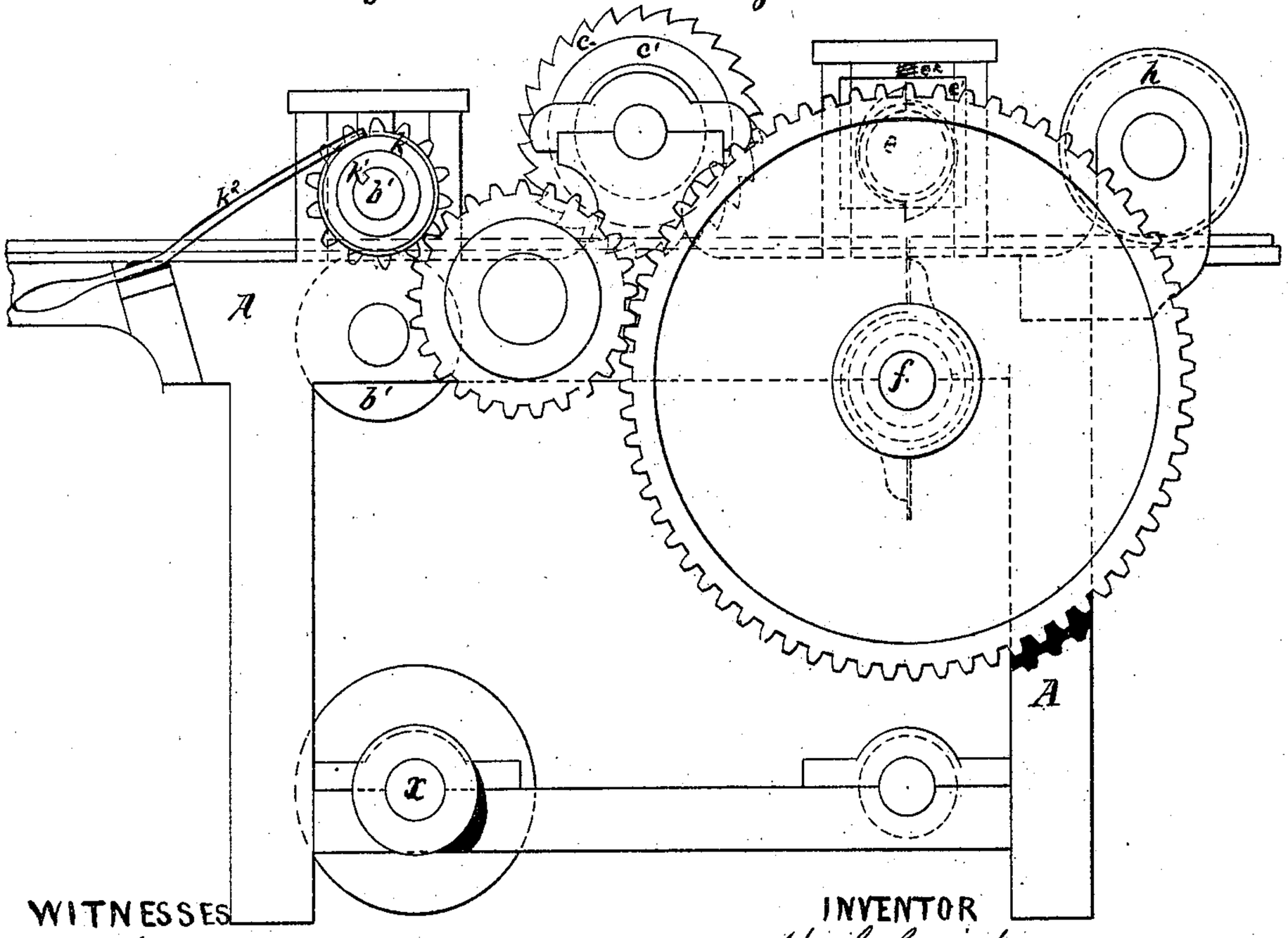


Fig. 2



WITNESSES

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2 Sheets—Sheet 2.

H. S. SMITH.

MOLDING-MACHINE.

No. 177,433. Patented May 16, 1876.

Fig. 5.

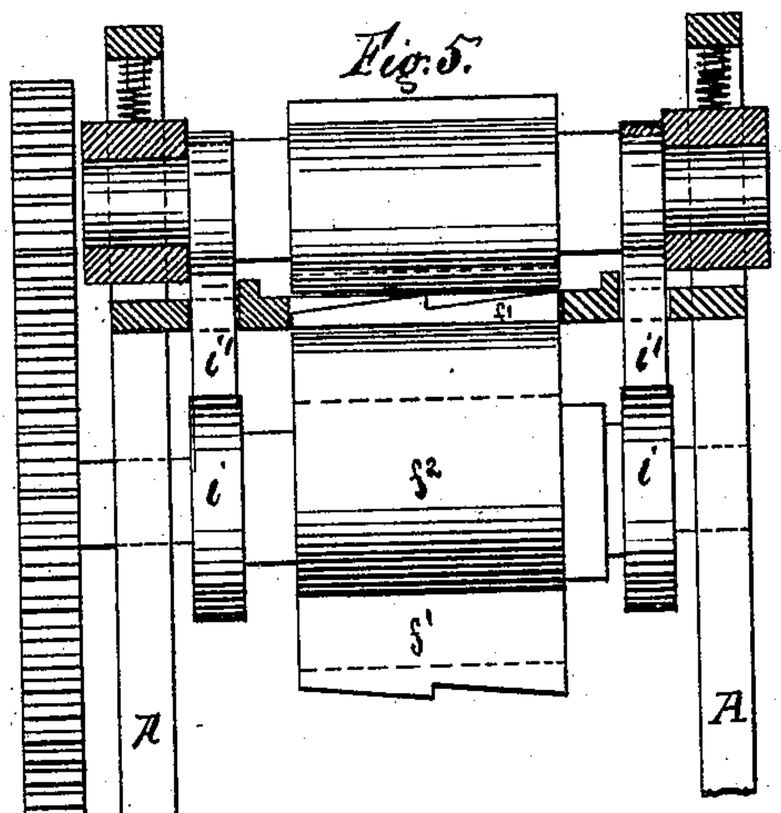


Fig 4

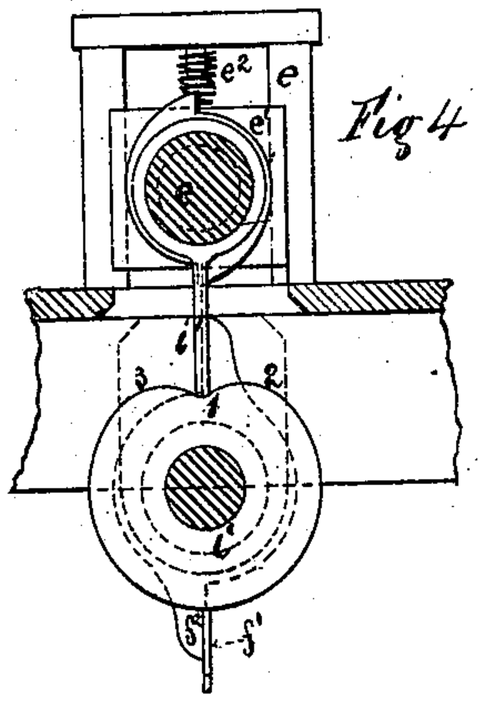
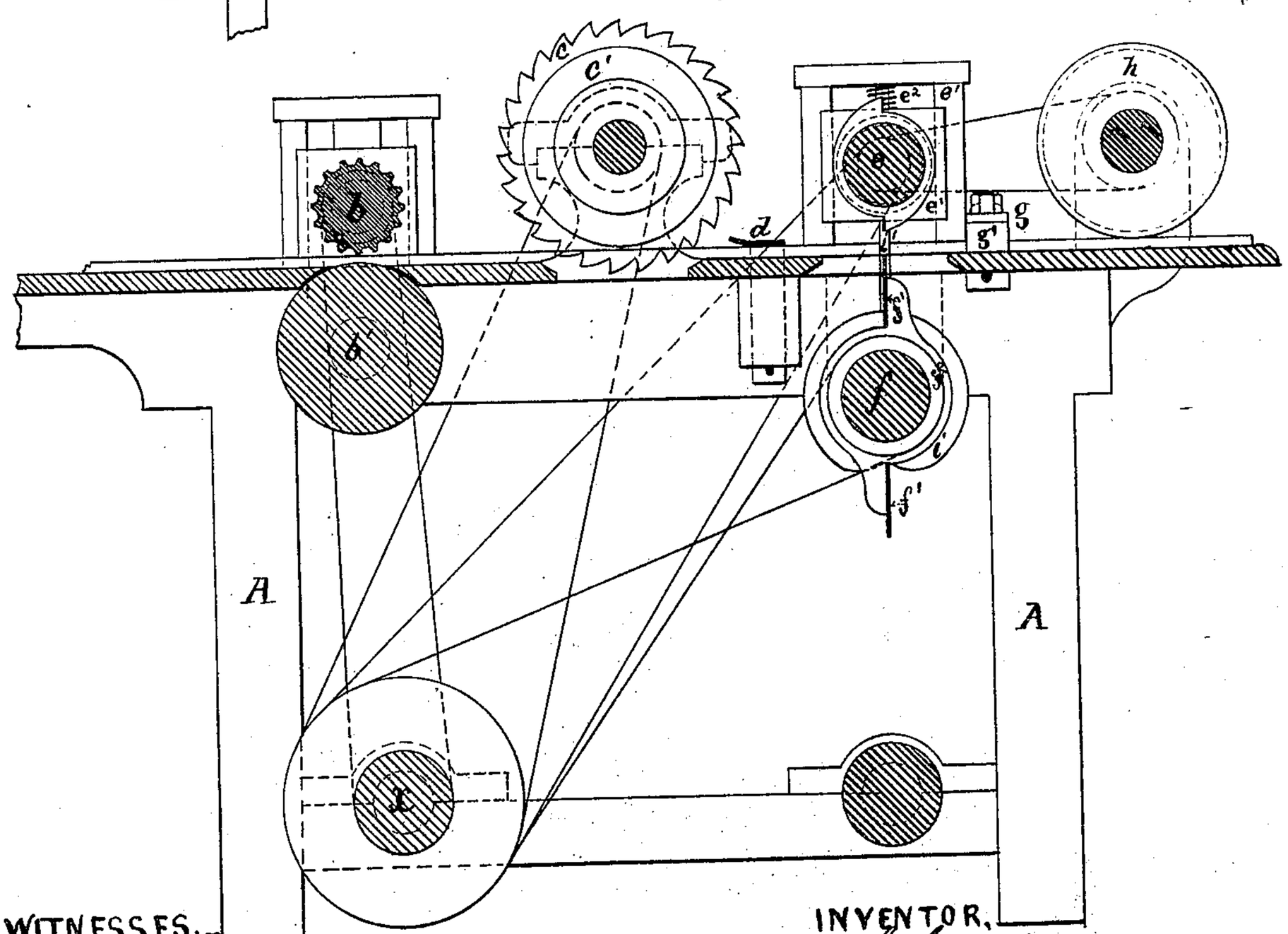


Fig 3



WITNESSES:-

M Gardner

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UNITED STATES PATENT OFFICE.

HEMAN S. SMITH, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MOLDING-MACHINES.

Specification forming part of Letters Patent No. **177,433**, dated May 16, 1876; application filed October 13, 1875.

To all whom it may concern:

Be it known that I, HEMAN S. SMITH, of Brooklyn, Kings county, New York, have invented certain Improvements in Molding-Machines, of which the following is a specification:

My invention relates to wood-working machinery, and consists of combined devices for sawing, planing, and polishing, by the operation of which a plank is divided into strips, and each strip is planed on both sides and tapered at both ends, and polished for use as a barrel-hoop.

Figure 1 is a top view of my combined sawing, planing, and polishing machine; Fig. 2, a side elevation thereof; Fig. 3, a longitudinal vertical section; and Fig. 4 is a view of the cams for governing the elevation of the upper planing-tools.

The frame of my machine, A, supports the usual platen or bed of a planing-machine, and is provided with the various standards required for furnishing bearings to the shafting and axes of the cutting and polishing tools. The plank to be operated upon is placed upon the bed and fed forward to the cutting instruments by the action of the corrugated feed-roller *b*, which acts upon the upper surface of the plank while the under surface is passing over the periphery of the friction-roller *b'*. The periphery of this friction-roller has devices or legends carved or otherwise fixed upon it in relief, so that the designs or legends are stamped upon the under surface of the plank as it passes through the machine. The plank is fed up by the operation of the corrugated roller to a series of two or more circular saws, *c c c*, arranged at prescribed distances upon the shaft or mandrel *c'*. These saws divide the plank into strips, and the ends of the strips, as they pass along the bed beyond the saws, catch under and are held down by the spring presser-bar *d*. Immediately beyond the presser-bar the strips are presented to the action of revolving planing-tools mounted, respectively, upon the shafts *e* and *f*. These shafts occupy the same vertical plane, so that the action of the cutters upon the upper and under surfaces of the strips is simultaneous. The upper shaft *e* is provided with straight-edged cutters for planing the upper surface of the strips flat, while the lower mandrel is provided with inclined cutters for the purpose of planing the under side of the strips to a bevel. A slotted bar, *g*, is arranged across the bed immediately beyond the planing-tools, and provided with the adjustable pins *g' g' g'*, which enter the slits cut by the saws, and hold the strips in their proper position in line, so that they will not be pushed sidewise by the thrust of the inclined cutters. Immediately beyond the supporting-pins are the polishing-rollers *h*, which act upon the upper surfaces of the strips.

It is necessary that hoops should be tapered at the ends, and to accomplish this in my machine I mount the shaft *e* in the vertical sliding boxes e^1. These boxes are forcibly pressed down by the springs e^2, and the vertical position of the shaft *e* is governed by two cams, *i i*, respectively, affixed to the opposite ends of the shaft *f*. These cams engage the lower ends of two vertical arms, *i' i'*, which project upward through the bed, and clutch or embrace the shaft *e*. The lower planing-tools f^1 are affixed to a hollow shaft, f^2, which is loosely mounted on the cam-shaft *f*. The cam-shaft *f* derives its motion through a train of gearing connected with the pinion *k* loosely mounted on the corrugated feed-roller shaft *b'*. A sliding clutch, k^1, is loosely keyed on the shaft *b'*, and operated by the hand-lever k^2 for imparting motion to the feed-roller *b* at pleasure. The object of this arrangement is to so govern the feeding of the plank as to present the ends of the strips to the planing-tools at the time when the shaft *e* is lowest—that is, when the arms *i' i'* are resting at 1 in the bottoms of the cavities in the cams, as shown in Fig. 4. The feed-roller is then rotated, and as the plank feeds forward the shaft *e* gradually rises, in obedience to the motion derived from the rise in the cams, until the arms have reached the point 2, after which the shaft *e* remains upon the same level until the arms have reached the point 3, and commenced to descend toward the bottom of the cavities in the cams. By this mode of operation the strips are tapered a prescribed distance at each end, as required in the manufacture of hoops. The planks operated upon are cut of the exact length required for the hoops, and

one plank follows another upon the bed of the machine, so that when the cams are once adjusted the operation of cutting the tapering ends is continuous. The speed of the cam-shaft is regulated so that it has one revolution during the time occupied by the feed-roller in driving one length of plank through the machine. The motion is imparted from the main shaft *x* by means of belts from pulleys keyed to the main shaft, through pulleys affixed to the feeding, sawing, planing, and polishing shafts, substantially as shown in the drawings.

I claim as my invention—

1. The revolving planer-shaft *e*, mounted in the sliding bearings e^1, in combination with the cam *i*, constructed and operating as herein described, and for the purpose set forth.

2. A hoop-machine, in which are combined saws for dividing a plank into strips, a planer to smooth one side of the strips, and a planer to bevel the other side, one of the planers being connected with a cam, or other equivalent mechanism, for causing it to rise and fall, for the purpose of tapering the ends of the hoops, substantially as specified.

H. S. SMITH.

Witnesses:

GEO. L. FARR,

EDWD. PAYSON.