(No Model.) 4 Sheets—Sheet 1.

T. S. DISSTON.

SHINGLE PLANING MACHINE.

No. 312,444. Patented Feb. 17, 1885.

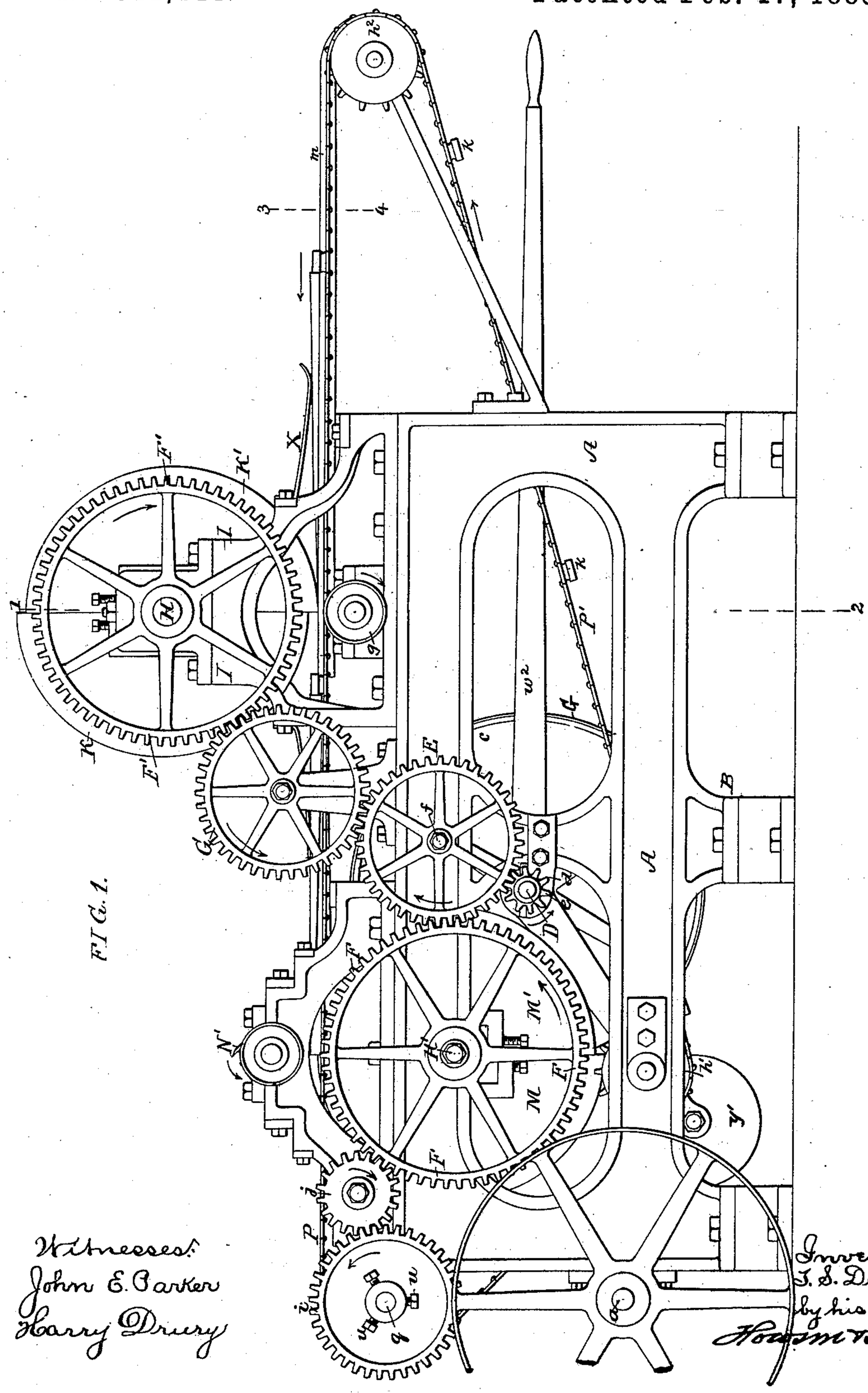


FIG. 1.

(No Model.)

4 Sheets—Sheet 2.

T. S. DISSTON.

SHINGLE PLANING MACHINE.

No. 312,444. Patented Feb. 17, 1885.

FIG. 4.

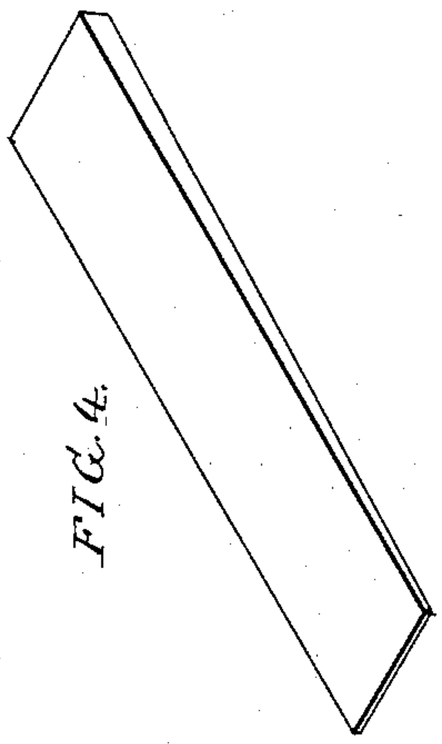


FIG. 3.

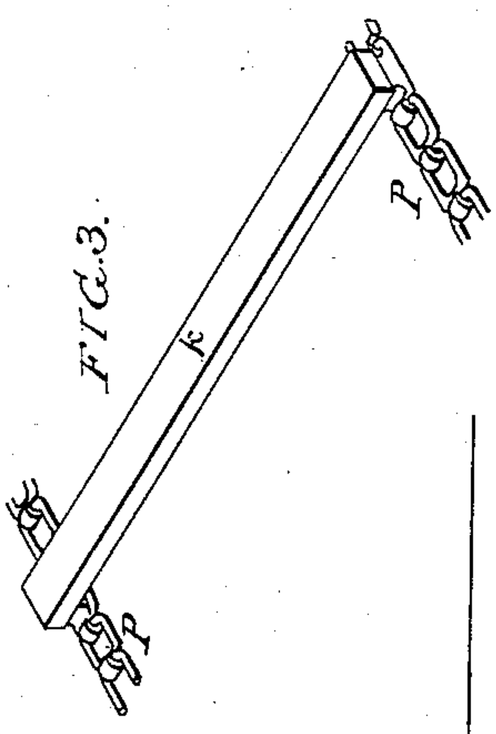


FIG. 2.

Witnesses:
John E. Parker
Harry Drury

Inventor:
T. S. Disston
by his Attys.
Howson & Sons

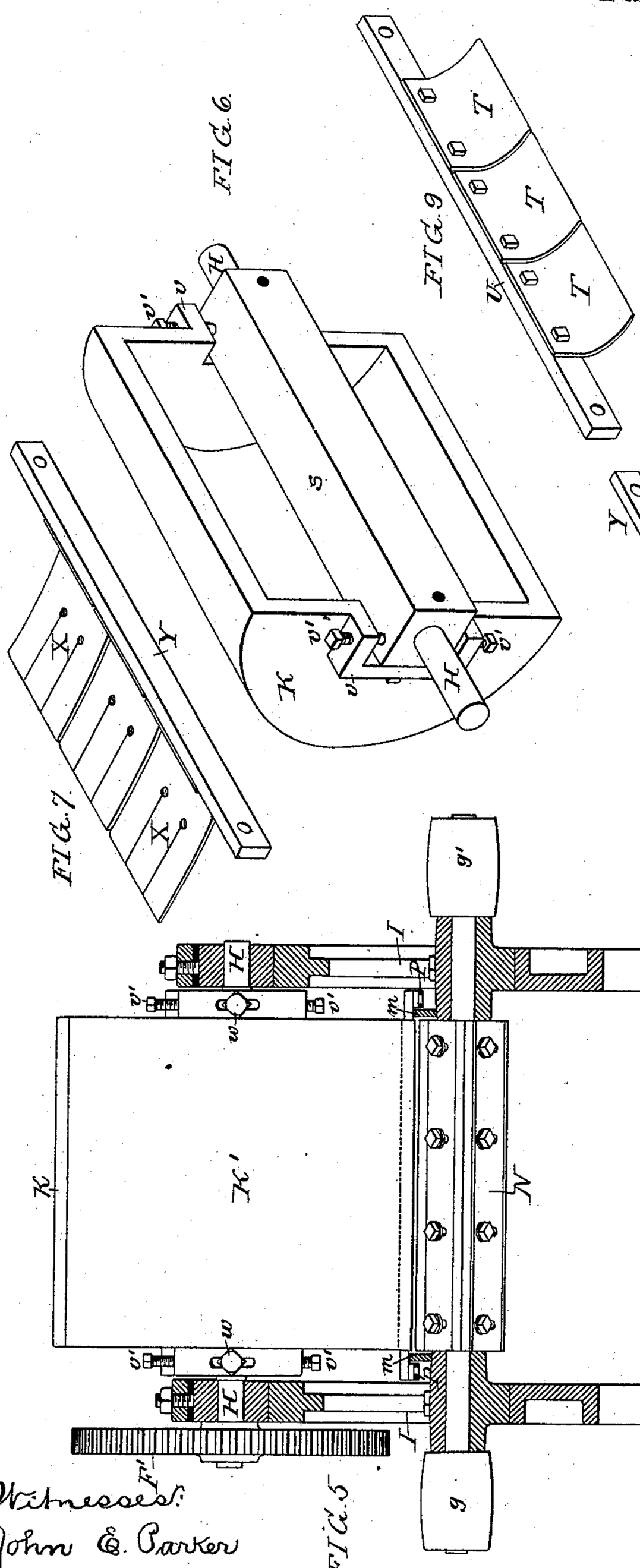
(No Model.)

4 Sheets—Sheet 3.

T. S. DISSTON.

SHINGLE PLANING MACHINE.

No. 312,444. Patented Feb. 17, 1885.



(No Model.) 4 Sheets—Sheet 4.

T. S. DISSTON.

SHINGLE PLANING MACHINE.

No. 312,444. Patented Feb. 17, 1885.

FIG. 12

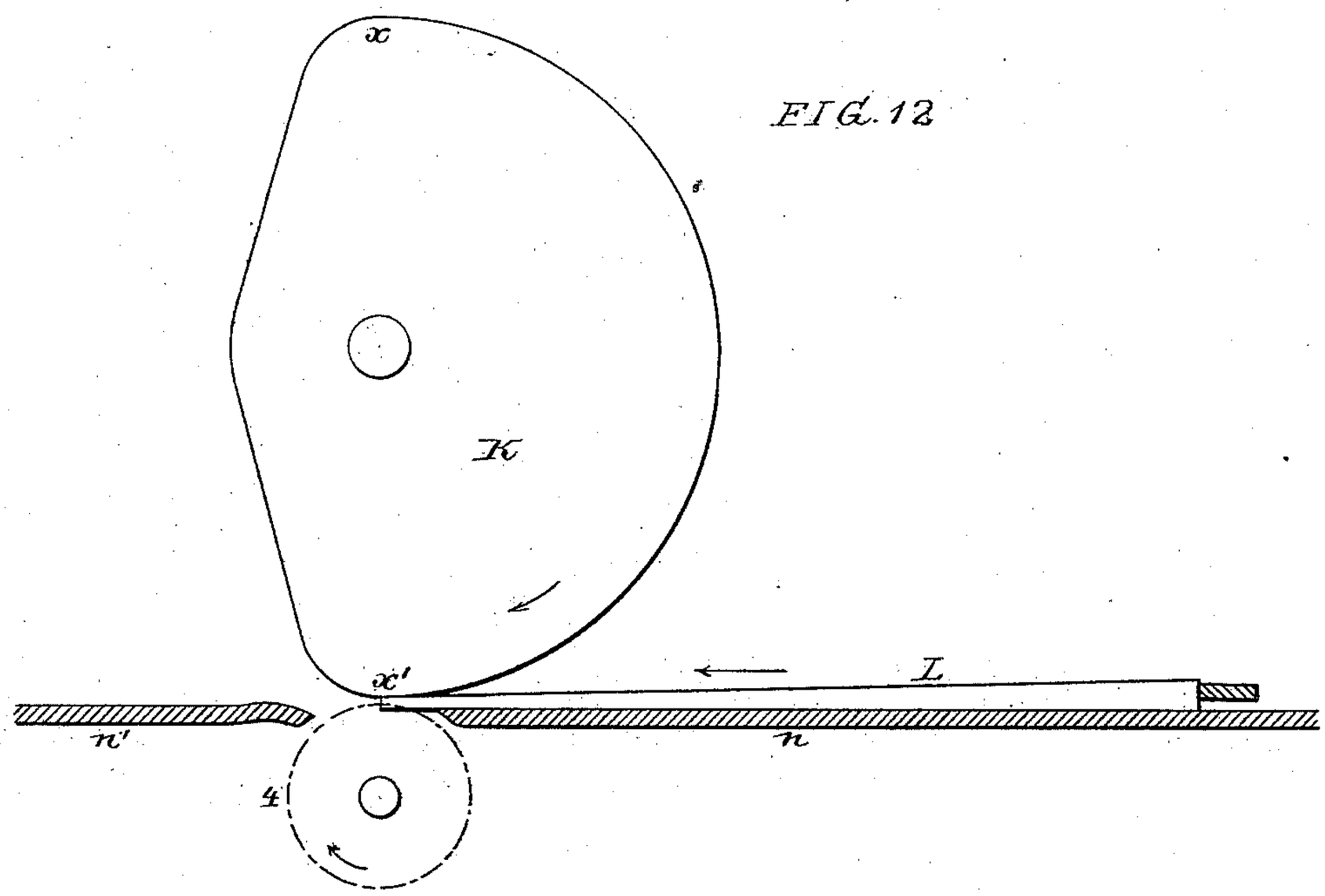
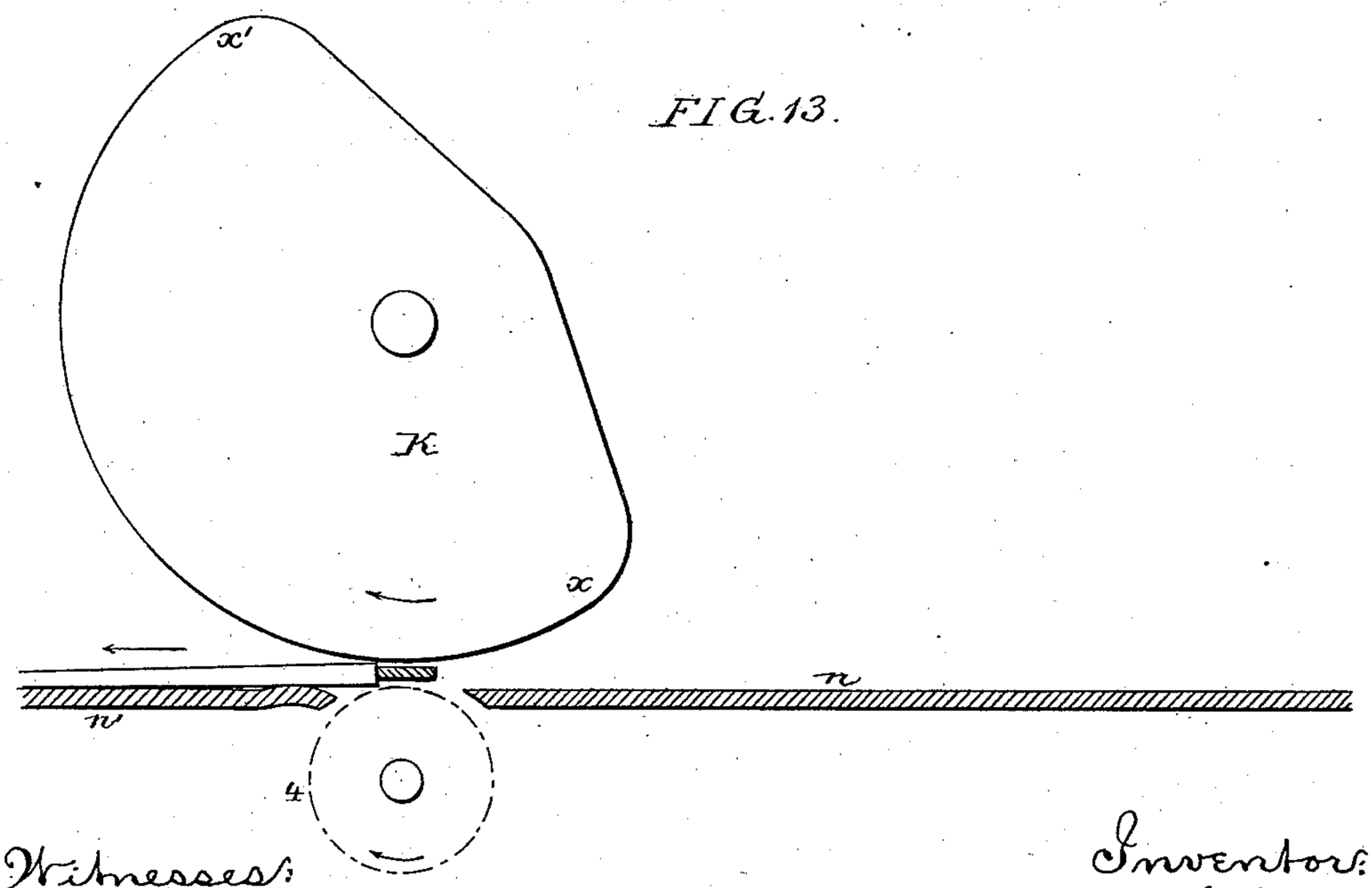


FIG. 13.



Witnesses:
John E Barker
Harry Drury

Inventor:
Thomas S. Disston
by his Attorneys
Howson & Sons

UNITED STATES PATENT OFFICE.

THOMAS S. DISSTON, OF PHILADELPHIA, PENNSYLVANIA.

SHINGLE-PLANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 312,444, dated February 17, 1885.

Application filed December 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS S. DISSTON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Shingle-Planing Machines, of which the following is a specification.

My invention consists of mechanism, fully described and claimed hereinafter, for planing shingles and reducing them to the desired tapering form, the main feature of my invention consisting of the combination of a rotary cutter for planing one side of the shingle, and an eccentric bed against which the opposite side of the shingle bears as it is being acted upon by the cutter, the bed moving as the shingle is being pushed between it and the eccentric bed, the latter thus delivering the extent of reduction.

In the accompanying drawings, Figure 1, Sheet 1, is a side view of my improved shingle-planing machine; Fig. 2, Sheet 2, a longitudinal section; Fig. 3, a perspective view showing parts of the endless chains and one of the pushers attached thereto; Fig. 4, a perspective view of a shingle; Fig. 5, Sheet 3, a vertical section on the line 1 2, Fig. 1; Figs. 6, 7, 8, 9, and 10, perspective views of detached parts of the machine; Fig. 11, a section on the line 3 4, Fig. 1; and Figs. 12 and 13, Sheet 4, diagrams illustrating the main features of my invention.

A preliminary understanding of my invention may be best imparted by referring in the first instance to the diagrams Figs. 12 and 13, in both of which *n* represents a fixed plate, over which the crude tapering shingle L is pushed, the dotted circle 4 indicating the path of the cutting-edges of the blades of the rotary cutter, and K the eccentric bed against which the shingle bears as it is being acted on by the cutters. This bed is made in the arc of a circle from *x* to *x'*; but this arc is eccentric in respect to the axis of the shaft by which the bed is carried, the surface of the bed at *x* being at a greater distance from the center of the shaft than it is at *x'*. If the thin end of the shingle is introduced between the most prominent part *x'* of the surface of the bed and the cutter, and the bed be turned in the direction of their arrows, and then the shingle be pushed in the direction of its arrows, the under side of the shingle will be planed, and the shingle will be of the desired uniform taper, providing it be pushed at a speed bearing a proper relation with that at which the surface of the bed moves, for during the movement of the bed its surface, owing to its eccentricity, recedes from the cutter.

I will now proceed to describe the machine as I prefer to make it in carrying out the main feature of my invention: Two side frames, A A', and a base, B, to which they are secured, constitute the main frame-work of the machine. A driving-shaft, *a*, is adapted to suitable bearings, *b*, at the rear end of the frame-work, and a belt passing round this shaft and around a larger pulley, *c*, on a central shaft, D, adapted to bearings in brackets *d*, one of which is secured to each frame. A pinion, *e*, on this shaft gears into a cog-wheel, E, on a stud, *f*, projecting from one of the frames. The wheel E gears directly into a wheel, F, and is geared indirectly to a similar wheel, F', through the medium of an intermediate wheel, G, so that the two wheels F F' may turn in the direction of their arrows when the central shaft, D, is driven in the direction of its arrow. The wheel F' is secured to a shaft, H, which has its bearings on standards I, secured one to each frame of the machine, and to the shaft are secured semi-cylindrical beds K K', preferably in the manner explained hereinafter. The cog-wheel F is secured to the shaft H', which has its bearings on the frame, and to which are secured the semi-cylindrical beds M M'. It will be seen that each of the beds K K' is eccentric in respect to the axis of the shaft H. The most prominent portion of the bed K is the edge *x*, which is diametrically opposite the prominent portion of the bed K', and this rule is observed in the arrangement of the beds M M'. There are two rotary planers, N N', the former being directly below the shaft H and the latter above the shaft H'. These planers are substantially similar to those used in wood-planing machines, and are too fully shown in Fig. 10 to need minute description. The shaft of the planer N is preferably furnished with two pulleys, *g g'*, (see Fig. 5,) for receiving belts from pulleys on a power driver-shaft, while the shaft of the planer N', which has not the same severe duties to perform as the planer N,

may be furnished with a single pulley. There are two endless chains, P P′, passing, one around sprocket-wheel *h* on a shaft, Q, and the other around a similar wheel on the same shaft, each chain being guided by sprocket-wheels *h′* and *h²*, so as to take the course pointed out in Fig. 2. The shaft Q has its bearings in the frame of the machine, and is furnished with a cog-wheel, *i*, driven from the wheel F through the medium of an intermediate wheel, *j*. Two endless chains are connected together at intervals by transverse slats or pushers *k*, and each pusher in succession as the chain moves in the direction of the arrow takes its place on guide-bars *m m*, secured to the frame of the machine, and, as shown in Figs. 2, 5, and 11, these bars extend from the point 2 at the front end of the machine to the point 3 at the rear of the planer N.

Between the two bars *m m* is a plate, *n*, (shown in Fig. 2,) this plate extending from the point 2 to within a short distance of the first planer, N, and between the two planers is a second plate, *n′*, both plates being permanently secured to the frame of the machine.

It should be understood that the shingles on which the machine is to operate have already been sawed or cut to a taper, the duty of the machine being to plane both the upper and lower surfaces of the shingles.

As the several parts of the machine are moved in the directions pointed out by the arrows, the attendant places one or more crude shingles—generally three—side by side on the plate *n*, introducing the thin ends of the shingles beneath the free ends of the springs X, which are secured to the frame of the machine. Here the shingles remain until one of the slats *k* on the endless chains pushes them forward between the rotary planer N and the semi-cylindrical bed K′, when the prominent portion *x′* of this bed is above or nearly above the planer, as shown in Fig. 2. As the movement of the shingle is continued, the surface of the bed, owing to its eccentricity, gradually recedes from the planer, as recounted above, and hence when the shingle has passed clear of the planer its under surface will be planed, and it will have a taper determined by the extent of eccentricity of the bed. After leaving the planer N, the shingles are carried over the bed *n′*, being confined thereto by the free ends of the springs X′, secured to the frame of the machine, the end of the shingle finally passing between the planer N′ and the semi-cylindrical bed M′, when the prominent portion of the said bed is directly beneath the planer, the combined action of this planer and bed being precisely similar to that above described, and the upper surface of the shingles being reduced to the desired extent and their proper taper being maintained. In the meantime, and before the first set of shingles reach the planer N′, a second set of shingles is approaching the planer N, and the reduction of the under surface of the second set of shingles will be determined by the planer N and the bed K, the reduction of the upper surfaces of the first set of shingles being determined by the planer N′ and the bed M′. It will now be seen that two sets of shingles are operated on simultaneously as the machine is in operation, the under surface of one set being reduced by the planer N simultaneously with the reduction of the upper surface of another set by a planer, N′, this simultaneous action on two sets of shingles being permitted by the use of two semi-cylindrical eccentric beds for each planer. There must be unison of action between the endless chains and pushing-slats and the movements of the beds, in order that the above results may be properly attained, for each bed must have its prominent portion above or nearly above the planer when the thin ends of the shingles are subjected to the latter.

The proper adjustment of the endless chains in respect to the beds can be readily effected by the adjustment of the cog-wheel *i* on the shaft Q, as shown in Fig. 1, the hub of the said wheel having set-screws *u*, so as to release the wheel from the shaft when the adjustment is required and secure it after adjustment.

I have described the machine as I prefer to make it; but it should be understood that there may be two separate machines, each composed of two eccentric beds, one planer, with adjuncts referred to above, one machine for planing the under surface of the shingles, after which the latter may be removed to the second machine, by which their upper surfaces are planed, if shingles planed on both sides are required. A practical machine may also be made by the combination of a single eccentric bed and a rotary cutter, as shown in the diagram, with endless chains; but this would necessarily be much slower in performing the duties required than the machine described. I, however, wish it to be understood that I consider the two last combinations mentioned as being within the scope of my invention.

Referring now to Figs. 2 and 6, the parts of the shaft H to which the semi-cylindrical beds are secured are square, and each end of each semi-cylindrical bed has flanges *v*, through which pass set-screws *v′ v′*, bearing against opposite sides of the square portion of the shaft, the recess in the flat faces of the bed for receiving the square parts of the shaft being elongated. By the manipulation of these screws the extent of the eccentricity of the two beds in respect to the axes of the shaft may be varied as the desired taper to be imparted to the shingles may suggest, and in order to firmly secure the bed to the shaft after adjustment bolts *w* pass through the flanges *v* of the two beds and through the shaft, as shown in Fig. 2, the holes in the flanges *v* through which the bolts pass being, of course, elongated to permit the above-explained adjustment by the set-screws.

Referring to the plate *n*, on which the shingle is placed, it will be seen on reference to Fig. 2 that it is secured to the frame of the machine at *y*, so that a portion of the plate nearest the planer N is overhanging. I prefer to make this overhanging portion of the plate slightly elastic, and to give it an upward tendency at and near its termination, so that it may exert a slight effort to force the shingle against the bed. Two springs, T T, on each side of the cutter N′ serve the same purpose of pressing the shingle against the second pair of beds, M M′, these springs (shown in the detached view, Fig. 9) being preferably arranged in sets of three, and being secured to bars U, attached to frames of the machine. The springs X X′ are arranged in sets, as shown in Figs. 7 and 8, and in like manner are secured to bars Y, attached to the frames of the machine, the outer portions of the springs being preferably split, so as to form elastic tongues which will yield slightly to the irregular surfaces of the shingles as they are pushed beneath them. It is important that the pushing-slats of the endless chain should in no case come in contact with the cutters of the rotary planers; hence the guide-bars *m*, over which the slats traverse, these bars always maintaining the slats free from contact with the first planer, N, and in order that the slats cannot come in contact with the second planer, N′, I cause them to traverse beneath bars *m′*. I prefer to cause the driving-belt G, which passes around the driving-pulley *a* and pulley *g*, to also pass over a pulley, *y′*, carried by a lever, *w′*, which is pivoted to the shaft D, and which has an arm, w^2, within reach of the attendant. This is a well-known device for starting and stopping a machine, and therefore may not be more minutely described.

I claim as my invention—

1. The combination, in a shingle-planing machine, of a plate on which the shingles are placed, and mechanism for pushing the said shingles over the plate, with a rotary planer on one side of the plate, and an eccentric bed on the opposite side of the same, substantially as set forth.

2. A shingle-planing machine in which the following elements are combined, namely: first, a plate on which to place the shingles; second, an endless chain with pushers for moving the shingles over the bed; third, a rotary cutter; fourth, an eccentric bed for the shingles to bear against as they are acted upon by the cutter, and, fifth, driving mechanism whereby the said endless chain and bed are caused to operate in unison, substantially as specified.

3. The combination of the plate, endless chains, and pushers for traversing the shingles over the plate, with a rotary cutter and a shaft, H, and two eccentric semi-cylindrical beds attached thereto, all substantially as specified.

4. The combination, in a shingle-planing machine, of beds *n n′*, endless chains and pushers for traversing shingles over the beds, a rotary cutter, N, below the bed, two semi-cylindrical beds above the same, a rotary cutter, N′, above the bed, and two semi-cylindrical beds below the same, substantially as set forth.

5. The combination of the shaft H and its square portion *s* with the two semi-cylindrical beds adjustably secured to the shaft, substantially as specified.

6. The combination of the bed K K′, rotary cutter N, plate *n*, and the endless chain and its pushers with the guide-bars *m m*, substantially as described.

7. The combination of the beds M M′, bed *n′*, rotary cutter N′, the endless chain and its pushers, and the guide-bars *m′ m′*, substantially as described.

8. The combination of the beds K K′ and the rotary cutter N with the bed *n*, having an overhanging elastic portion, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOS. S. DISSTON.

Witnesses:
HENRY BOSSERT,
HARRY SMITH.