(No Model.)

# E. C. SMITH.

## CIRCULAR SAWING MACHINE.

No. 306,186. Patented Oct. 7, 1884.

Fig. 2.

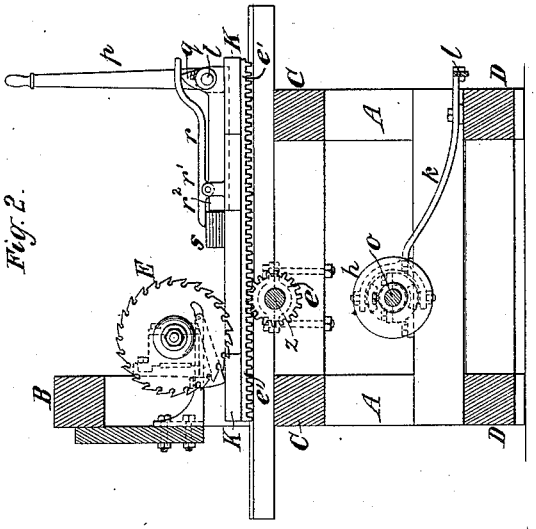


Fig. 4.

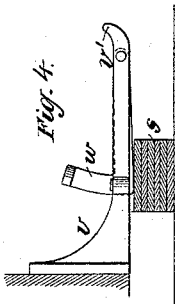


Fig. 5.

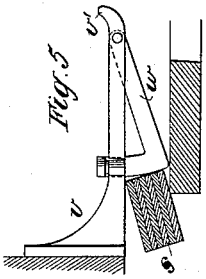


Fig. 1.

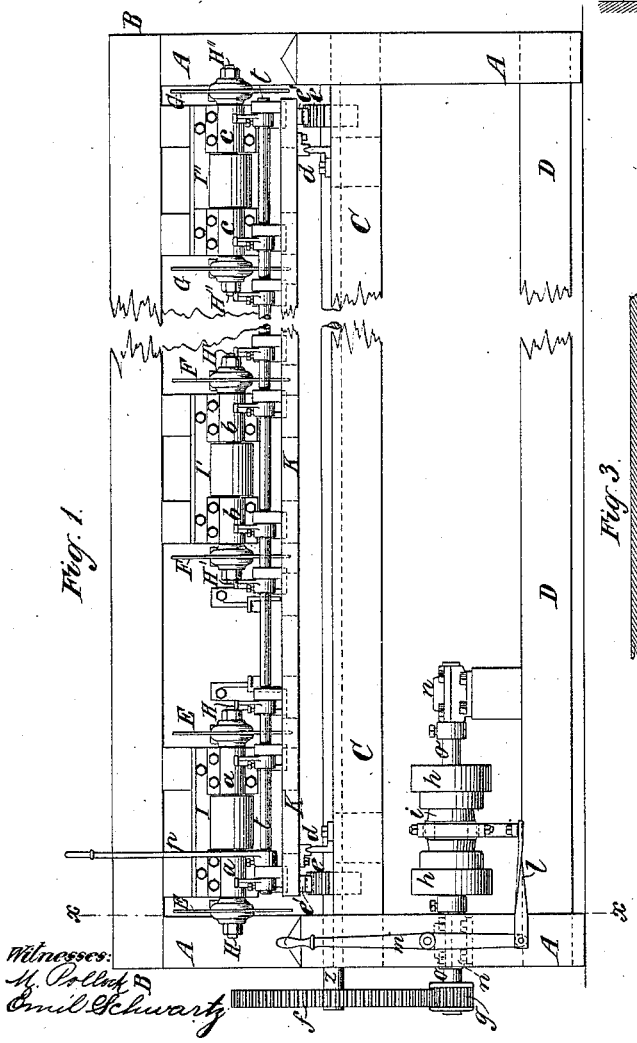
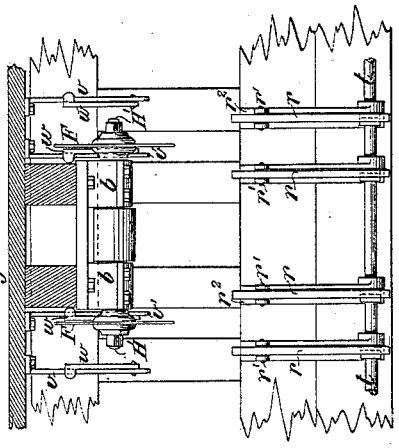


Fig. 3.



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# UNITED STATES PATENT OFFICE.

EDWARD C. SMITH, OF BROOKLYN, NEW YORK.

## CIRCULAR SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,136, dated October 7, 1884.

Application filed July 10, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD C. SMITH, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Crosscut-Sawing Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to that class of sawing-machines in which circular saws are used arranged in pairs, and which are especially adapted to the cutting of several boards or lengths of prepared lumber simultaneously into pieces suitable for the manufacture of boxes, packing-cases, and like articles.

The invention consists in the construction and combination of the various parts of said machine, hereinafter more fully described and claimed, whereby large quantities of prepared lumber can be speedily and properly sawed into suitable sizes for the purpose hereinbefore mentioned.

Figure 1 is a side view of a crosscut-sawing machine constructed according to my invention. Fig. 2 is a transverse vertical sectional view of the same, taken upon the line *x x* of said Fig. 1. Fig. 3 is a detail view, partly in section, of a part of said machine, in which are illustrated in plan one of the pairs of saws with its mandrel-bearings and pulley, a part of the clamping device of the carriage, and a part of the apparatus for discharging cut boards from the machine. Figs. 4 and 5 are detail views of the device for discharging cut boards from the machine.

A and A are the corner-posts of the machine; B, C, and D, horizontal bars, which with said corner-posts form the frame of the machine.

Upon the mandrels H H′ H″, which run in bearings *a b c*, bolted to a plate, I, which is bolted to the said frame, there are mounted the saws E, F, and G. These mandrels are provided with suitable pulleys, and are with their saws driven by a proper belt-connection with said pulleys.

K is a reciprocating carriage sliding backward and forward on the metallic guide Vs, *d*, and *d*. This motion is effected by the pinion *e*, which is fastened on the shaft Z, and drives the toothed rack *e′*, which rack is fastened to the bottom of the carriage K. There are two of these rack-and-pinion attachments—one for each end of the carriage—as will be seen at *e e′* and *e e′* of Fig. 1. The shaft Z extends through the whole length of the machine, runs in bearings fastened upon the frame of said machine, and projects a little beyond the frame of the machine at one end. Upon this projecting end is mounted the large spur-wheel *f*, which meshes into and is driven by the pinion *g*. This pinion *g* is mounted on the short shaft *o*, which runs in bearings *n* and *n*, and carries the pulleys *h* and *h*. Between these two pulleys *h* and *h* there is provided on the shaft *o* a clutch, *i*, which is worked by the system of levers *k l m*. These pulleys *h* and *h*, which are loose on the shaft *o*, are driven by a suitable belt-connection, one with a direct belt and the other with a cross-belt, so that they run in contrary directions, and the operator by use of the clutch *i* may cause either one to turn the shaft *o*, so that by means of its connections he may move the carriage K either way (forward or backward) at his pleasure.

Upon the carriage K, which carries the boards S to be cut to the saws, are fixed a series of lever-clamps—two for each saw—(designated by *r r*.) These lever-clamps are fulcrumed at *r′* to the carriage with their shorter ends toward the saw. The longer ends, which are away from the saw, are bent, as illustrated in Fig. 2. The lever (designated by *p*) is rigidly attached to the shaft *t*, which shaft turns in suitable bearings on the carriage K. To this shaft *t* are attached a series of cams (denoted by *q*)—one for each clamp—to fasten the said clamps, as hereinafter described.

The device for removing the cut boards from the machine is illustrated in Figs. 3, 4, and 5. A bracket or arm, *v v′*, is fastened rigidly to the wooden upright part of the machine and provided with a drop, *w*, (represented in the form of an elbow,) which is pivoted by a pivot, *v′*, to the said arm *v* near its outer end. One end of the drop *w* being so pivoted, the other end thereof is formed into a head to keep the said drop *w* from falling too far out of the slot in which it works. There are two of these removing devices for each saw, and are arranged so that they stand one on either side of each saw, but so that they will not strike against the clamp *r r*, as illustrated in plan in Fig. 3.

In the operation of this machine, the boards to be sawed are laid upon the carriage parallel to its edge, at right angles to its line of motion, and under the clamps *r r* and against a series of fixed gages, $r^2$. The operator, then turning the lever *p* upright, brings the cam *q* into the position illustrated in Fig. 2, when the long side of the cam *q*, pressing on the under side of the long ends of the clamps *r*, causes the short end of said clamp to bind the boards on the carriage K. Then, by moving the lever *m* and putting the clutch *i* into gear with one of the pulleys *h*, he causes the carriage to travel forward toward the saws, bearing with it the boards with which it was loaded, and which lift the drops *w* to pass under them, as illustrated in Fig. 4. As soon as the saws have passed through the boards, he releases the clutch *i* from the pulley *h* to stop the forward motion of the carriage. In the meantime the drops *w* will have, of their own gravity, fallen behind the edges of the boards. The clamps *r r* are now released by turning the lever *p* into a horizontal position. The clutch *i* is then put into gear with the other pulley at *h* by the lever *m*, and the carriage travels back to its first position. In its backward motion the carriage K brings the cut boards against the elbow of the drop *w*, and the boards, being now loose, will, of their own weight, as the carriage is withdrawn, fall away from the machine, as illustrated in Fig. 5.

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

1. In a crosscut-sawing machine, the combination, with a series of circular saws hung in pairs, their mandrels, driving-pulleys, and means of rotating said saws, of a reciprocating lumber-carriage provided with adjustable clamps and drops attached to the frame of the machine and arranged to be lifted by the boards as they pass under them on said carriage to the saws, to fall behind said boards when they have passed, and to operate in connection with said carriage for removing cut boards therefrom, substantially as herein described.

2. In a crosscut-sawing machine, the combination, with a series of circular saws hung in pairs, their bearings, and means of rotation, and a reciprocating lumber-carriage having adjustable clamps for holding the lumber thereon, of fixed arms or brackets *v*, rigidly attached to the frame of said machine, and drops *w*, pivoted to the said arms or brackets extending rearward between the saws and arranged to be lifted by the boards as they pass under them to said saws, to fall behind the boards when they have passed, and to operate in connection with said reciprocating carriage to remove the sawed boards therefrom, substantially as herein described.

3. In a sawing-machine, the combination of the reciprocating carriage K, of the series of clamps *r*, their pivotal bearings, and the shaft *t*, common to all of said clamps, mounted in bearings upon said carriage, and carrying a cam for each clamp and furnished with a lever, *p*, substantially as and for the purpose herein described.

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