C. A. YOUNG.

Band-Saws.

No. 139,644. Patented June 3, 1873.

Fig. 1.

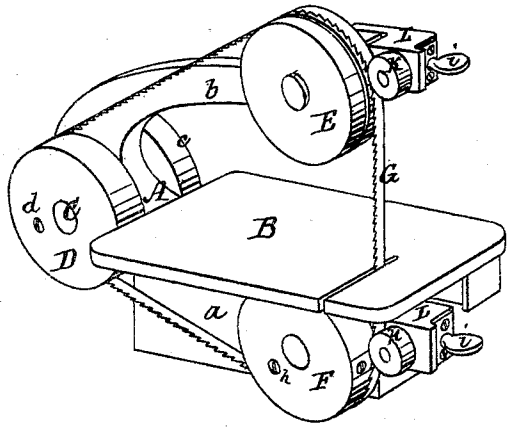


Fig. 2.

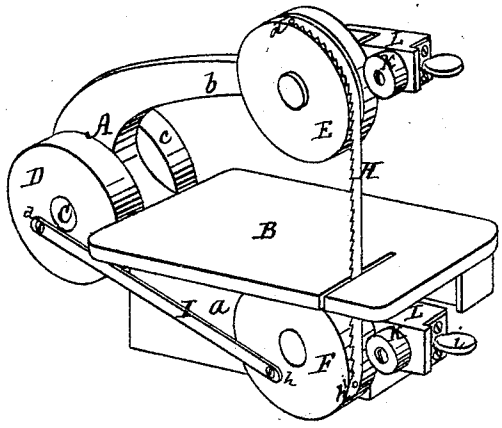


Fig. 3.

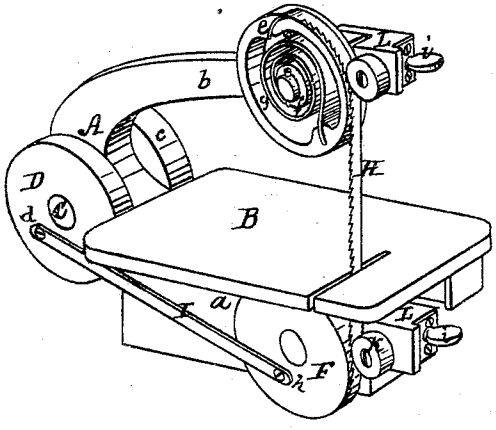
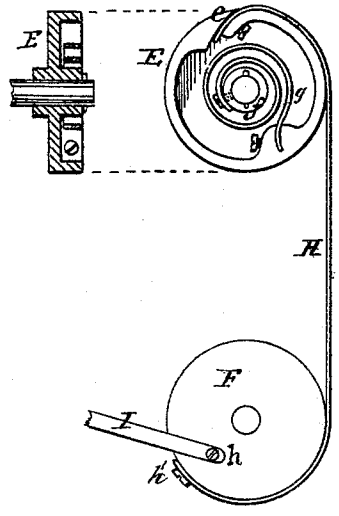


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES A. YOUNG, OF PROVIDENCE, ASSIGNOR OF ONE-HALF HIS RIGHT TO PARDON F. BROWN, OF MANTON, RHODE ISLAND.

IMPROVEMENT IN BAND-SAWS.

Specification forming part of Letters Patent No. **139,644**, dated June 3, 1873; application filed May 14, 1873.

To all whom it may concern:

Be it known that I, CHARLES A. YOUNG, of the city and county of Providence, in the State of Rhode Island, have invented a certain new and useful Improvement in Band-Saws.

My invention relates particularly to the general class of machines which are adapted to execute scroll-sawing; and it consists in the novel combination and arrangement of the saw driving and guiding or carrying mechanism, whereby a band-saw and a reciprocating-saw may be alternately applied thereto and operated thereon; and in a certain novel saw-tightener pertaining thereto, hereafter more fully described.

It has long been demonstrated that, for executing scroll-work having a continuous outline or accessible inner lines, the band-saw deservedly stands at the head of all others, as well from its complete and effectual clearance as from its continuous cutting action. So valuable are these saws for executing the class of work mentioned that many large shops employ them for "outlines," and also employ separate and distinct sawing-machines of the reciprocating or "jig" order for executing the interior lines or otherwise non-accessible cuts. Aside from the space which these separate machines must occupy, and the first cost of the said machines, there is involved the expense of handling the material attendant upon the conveyance of it from one machine to the other, and also the additional expense of the additional shafting, belting, and pulleys essential for the running of the second machine. It has, therefore, long been a desideratum that the two kinds of saws should be so arranged in one machine that either could be employed at will, and, although it has been proposed, and to some extent perhaps practiced, to bodily aggregate at one table two separate organizations of mechanism for successively operating a band-saw and a jig-saw, it is yet a great desideratum to present in one machine the saw driving, guiding, and carrying mechanism, so combined and arranged that they can be employed at will with slight changes for operating either of the two saws. As a result of my invention I claim to have produced a machine adapted to operate with the same mechanism—a "jig"-saw, as well as a band-saw, or vice versa, and one which will operate either saw as efficiently as any machine can possibly operate either of the saws to which it may be exclusively adapted, and also one which involves but little additional expense on account of its complex capabilities; and I do hereby declare that the following specification taken in connection with the drawings furnished and forming a part thereof is a clear and true description of sawing-machines embodying all the features of my invention.

Referring to the drawings, Figure 1 represents one of my complex sawing-machines in perspective and arranged to operate the band-saw. Fig. 2 represents the same arranged to operate a jig-saw. Fig. 3 represents the same with an upper guiding-pulley of different construction. Fig. 4 represents the same upper guiding or carrying pulley in section and side view on a somewhat enlarged scale.

In all of the figures, A denotes the frame of the machine, and consists of the bed *a* and overhanging bracket *b*. B denotes the table, which is located beneath the bracket on the bed. For small light saws the bed may be fitted for attachment to a work-bench, and in heavier machines mounted on legs common to machines of this general character. C denotes the main driving-shaft. It is fitted to bearings in the frame, and may be provided at one end with a belt-pulley, *c*, and at the other with the saw-driving pulley D, or the belt-pulley and saw-driving pulley may be united in one and mounted on a stud occupying the position in which the shaft C is shown. The saw-driving pulley D is essentially provided with a link connection. As shown in the drawings, it may be a detachable link-bolt, *d*, which engages in a tapped hole in the side of the pulley, or it may be permanently attached thereto. E denotes the upper guiding or saw-carrying pulley, which can be made in several different forms, and operate with

equal efficiency. In Figs. 1 and 2 it is in two distinct pieces, both of which are loosely mounted on a stud, which projects from the side of the outer end of the overhanging bracket *b*. The inner one next the bracket is wholly free to revolve on the stud, but the outer one is provided with an interior chamber, in which is a spiral spring, secured at one end to the pulley near its rim, and at the other end to the stud, in a manner well known, so that a rotative movement of the pulley will be resisted in a measure by the force of the spring. The exterior rim of this outer pulley is provided with a stud or bolt, with which the strap of a jig-saw can readily be made to engage in a manner well known. In Figs. 3 and 4 the pulley E is provided with a side recess, and a peripherical opening and clamp, *e*, for receiving the end of the jig-saw strap. Mounted on the stud, closely adjacent to the recessed face of the pulley, is a loose collar, *f*, which is provided with a set-screw, whereby it may be at will secured to the stud. The same set-screw secures to the collar the end of a spiral spring, *g*, the opposite end of which is made to engage with the pulley near its rim by means of a clamp or pin. For effecting a counterbalance on the pulley, any excessive presence of metal at one point near the rim should be offset by a corresponding excess at the point exactly opposite, as is common in like instances in other machines. F denotes the lower saw-carrying pulley. It is loosely mounted on a stud, which extends from the side of the bed of the frame, and is parallel with the main shaft and the upper stud. The pulley F may be made with a wide rim, and provided near its outer edge with a jig-saw strap-holding device, *h'*, or it may be made in two sections, like the upper pulley E in Fig. 1. On the outer side of the pulley F, however constructed, is a link connection, *h*, which can be constructed as the connection *d*, already described. Should the pulley F be made in one piece, it will be provided with a peripherical clamp for engaging the strap of the jig-saw, in a manner already described, and shown in Figs. 3 and 4. G denotes a band-saw, which extends over the saw-driving pulley, and the two guiding-pulleys, passing down through a suitable saw-slot in the table B, as shown in Fig. 1. H denotes a jig-saw provided with the usual end straps, which engage with the upper and lower carrying-pulleys respectively. To operate the jig-saw the band-saw is detached, the jig applied, and the shackle-bar or link I is connected at the ends with the driving-pulley and lower guiding-pulley. The continuous rotation of the main shaft will, therefore, according as the machine may be adjusted, produce a continuous downward movement at the table with one saw, or a reciprocating movement with the other. The several saw-pulleys will preferably be clothed on their faces with a suitable material—as, for instance, leather or rubber—in order to secure frictional contact with the band-saw and prevent it from slipping.

It will be seen by the novel arrangement of the driving and guiding pulleys, that I am enabled to attain any desired table space without the necessity of using large upper and lower wheels. For small light machines this arrangement of the pulleys is of special value, as the machine can thereby be made with less height, and much lighter, than if the two large wheels are employed.

Although embodied in this particular machine, and described and claimed herein, my straining and steadying rollers are well adapted for use, and have more or less value in machines capable of operating but one of either of the two kinds of saws.

The rollers or wheels K are each loosely mounted on a stud which projects from an adjustable frame, L, which is provided with a thumb-screw, *i*, by means of which it can be moved to and from the face of the saw-carrying or guiding pulley. The upper frame L is attached to the outer end of the bracket *b*, and the lower one to the bed beneath the table. In each instance they are set on a line with the axis of the adjacent pulley, so that when forced into contact with the face of the pulley or the interposed saw it will bear at the point where the latter leaves the face of the pulley. Preferably these rollers K will be covered with some elastic material adapted to frictionally engage with the saw-blade.

It will be seen that the bite on the saw is at the two ends of the vertical line, and that any sudden strains on that portion of the saw are prevented from being injuriously communicated to the portions of the saw which are in transit over the pulleys.

A band-saw is but little liable to break if it be firmly held in its place at the top and bottom of the vertical portion, and when pressed against the faces of the guiding-pulleys, as is done by the rollers K, all sudden strains or jerks are materially modified before they can act on the portion of the saw which is in contact with the pulley, or that portion which extends between the guiding and driving pulleys.

It will be seen that the additional devices and variations in construction by which, for instance, a simple band-sawing machine may be converted into a complex machine of the character described, involve but slight additional expense, and it is safe to allege that the complex machine will not cost to exceed ten or fifteen per cent. more than would a simple machine of either class, and that it is therefore well adapted to meet the requirements of the trade.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a complex scroll-sawing machine the combination, substantially as described, of the table, the overhanging frame, the saw-

driving pulley provided with a link connection, and the carrying-pulleys provided with gig-saw clamps or studs, and with a link connection whereby the same organization of mechanism may be made to operate a band-saw or a reciprocating saw, in the manner substantially as set forth.

2. The combination of the band-saw, the driving-pulley, and the guiding-pulleys, herein described, and their arrangement with relation to the table, as specified, whereby great depth of table can be attained in the direction of the driving-pulley, as set forth.

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