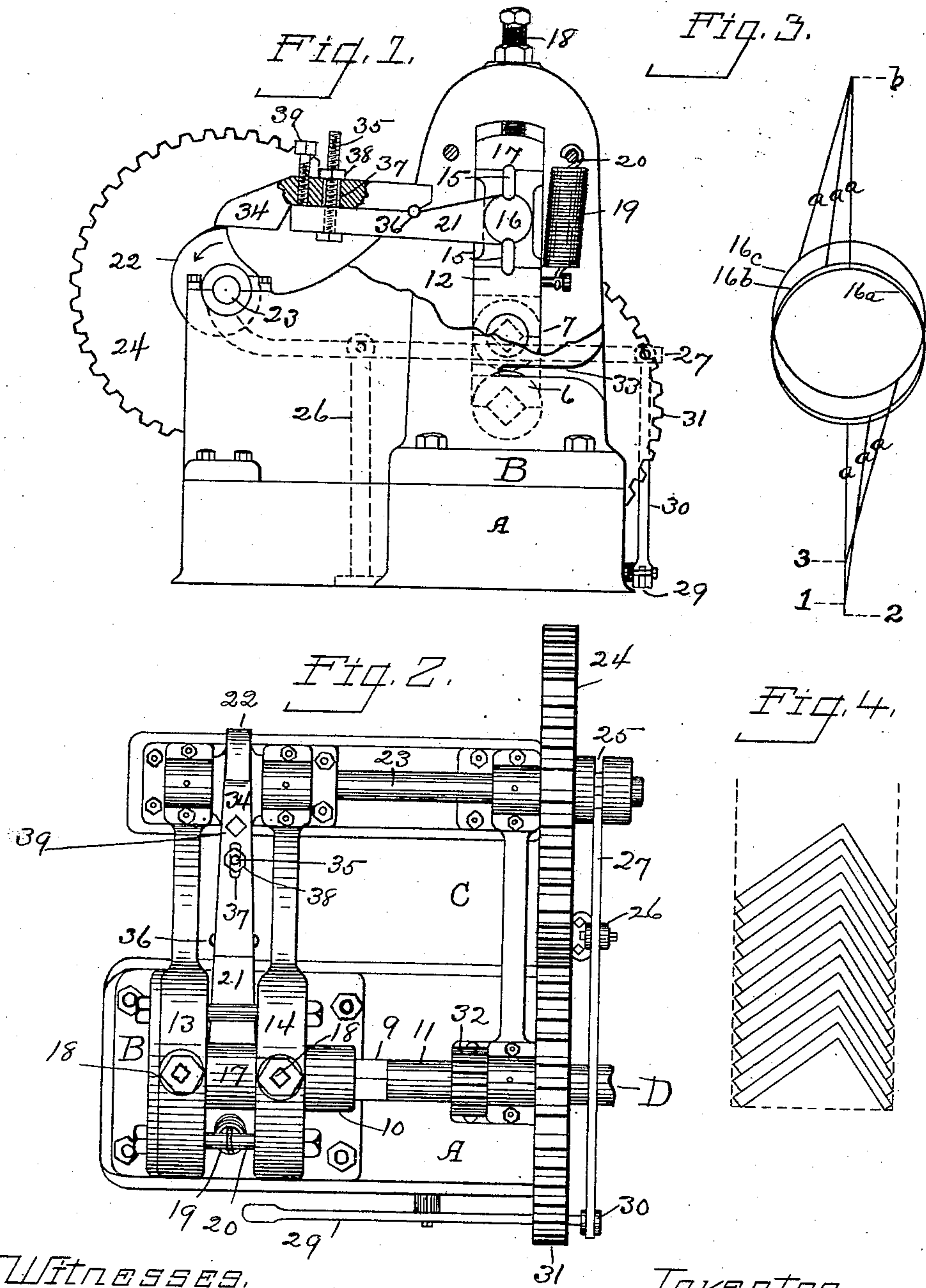


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PATENTED OCT. 29, 1907.

H. K. JONES.
MACHINE FOR ROLLING CARPENTERS' SQUARES.
APPLICATION FILED OCT. 4, 1904.



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MACHINE FOR ROLLING CARPENTERS' SQUARES.

No. 869,850.

Specification of Letters Patent.

Patented Oct. 29, 1907.

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To all whom it may concern:

Be it known that I, HORACE K. JONES, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Rolling Carpenters' Squares, of which the following is a specification.

My invention relates to improvements in machines for rolling carpenter's squares and the objects of my improvement are to provide means to readily adjust the machine to vary the taper of the work rolled and to provide a relief from an over strain of the machine.

In the accompanying drawing—Figure 1 is a side elevation of the left hand side of the machine with a part of the left hand upright of the frame broken off and a part of the sub-lever in section. Fig. 2 is a plan view of the machine. Fig. 3 is a diagram illustrating the difference in the throw of the toggle under a given movement when in different positions. Fig. 4 is a diagram, on a greatly reduced scale illustrating the shape of the blades and the manner of cutting them from a sheet of metal preparatory to rolling.

A, designates the bed of the machine, having mounted thereon at one end, the frame B for the rolls and adjacent parts and at the other end, the frame C for mounting the driving shaft D and connected parts. This driving shaft is shown in Fig. 2, with its outer end broken off. The frame B has two uprights 13 and 14 within which the rolls 6 and 7 are adjustably mounted to move relatively to and from each other and to be held in their adjusted position for giving the necessary pressure. As shown the upper roll 7 is the one that rises and falls to make the necessary variation of the space between the rolls. These rolls are mounted on short shafts and are driven by the main shaft D, having a square portion that engages a coupling at the end of the shaft for the lower roll 6, and a counter shaft 11, having a like square portion 9, and coupling 10 that connects said shaft with the shaft of the upper roll 7, the said shaft D and counter shaft being connected by a pair of gear wheels the upper one of which 32, is shown in Fig. 2. The upper half-box 12 for the upper roll extends from upright to upright of the frame so as to serve for both ends of the upper roll and to which the said roll is mounted so as to rise and fall with the said half-box. At the top of this half box, is a toggle link 15, and on this link is the toggle-lever head 16 surmounted by another toggle link 15, and cross bar or abutment 17, all of which extend from upright to upright of the frame. Set screws 18 extend through the uprights 13 and 14 and rest on the cross bar abutment 17 for adjusting the position of the upper roll when it is pushed downwardly by the toggle lever and links. A spring 19, the upper end of which is attached to the cross rod 20, and the lower end of which is secured to

the upper half box 12, has a constant tendency to lift the said half box and upper roll to its upper most position and to hold it up when not forced downwardly by the toggle mechanism. The toggle lever as a whole extends from its head 16 rearwardly to the cam 22, that is mounted on the cam shaft 23, at the rear part of the frames B, C. This cam shaft is driven by the gear wheel 24 and clutch 25, the said wheel being loosely mounted on the said shaft while the clutch is rigid thereon, so that the shaft is driven by the said wheel when the clutch is engaged therewith, but remains stationary while the wheel rotates when the clutch is disengaged therefrom. The gear wheel 24 engages with and is driven by a similar gear wheel 31 fixed on the driving shaft D, whereby the cam shaft and rolls move together. The clutch lever 27 is mounted on the bracket 26 and is thrown out of engagement with the clutch by means of the foot treadle 29 and bar 30 that connects one end of the foot treadle with one end of the said clutch lever.

In Fig. 4 the blanks to be rolled are shown as right angular blades that cannot be passed endwise through the rolls between ordinary uprights, hence the blade space 33 is made in the front of the upright 13. The machine thus far specifically described is the same as in my Patent No. 748,870 dated Jan. 5, 1904, to which reference is made for further details if desired.

My present invention is in the nature of an improvement thereon, or an improvement on machines of the general character thereof, which machines may differ largely therefrom as to specific constructions. In my aforesaid patent the toggle device including the lever constitutes mechanism between the cam and the rolls for reducing the motion of the cam. My present invention relates to an adjustment of this reducing mechanism, so that a given motion of the cam, that is, one revolution, may be made to close the rolls more or less whereby the taper of the blades rolled may be varied as desired.

The body 21 of the toggle lever extends back from the toggle head as before, only it stops short of reaching the cam so that it may be dropped down below the highest point of the cam without being hit by the said cam. The proper length to engage the cam is made by the sub-lever 34 that takes the place of the outer end of the toggle lever in my aforesaid patent. This sub-lever overlaps the lever body 21, and is held in position thereon, partly by the bolt 35 and partly by the pintle 36, that forms a joint between the body of the lever and the sub-lever. The said pintle, as shown is received in a hole drilled partly in each of the said two parts. A set screw 39 in a threaded hole in the sub-lever has its end resting on the body 21 of the toggle lever at a point nearer the outer end of the said body than the position of the bolt 35. Provision should

be made to permit the sub-lever to move on its pintle 36 while the movement thereof is limited in one direction by the said bolt. This provision as shown, is made by the slot 37, in the sub-lever through which 5 slot the bolt 35 passes. By this construction the nut 38 on the bolt 35 may be loosened and the set screw 39 screwed in to move the sub-lever on its pintle until the lever and sub-lever come to a firm bearing on the said set screw, bolt and pintle, and the sub-lever is 10 rigidly held substantially the same as if it was one piece with the body of the lever, only that it is adjustable when desired and is not so strong as a solid lever, whereby the bolt will break and prevent a breakage of more important parts of the machine in case of ac- 15 cident, or an undue clogging of the rolls. In order to show how this adjustment of the lever will change the taper of the work rolled at one revolution of the cam, I have shown in Fig. 3 a diagram of the lever-head and toggle links in three different positions. The abut- 20 ment of the toggle is designated *b*, 16^a represents the lever head in the position shown in Fig. 1, with its links *a a* in alinement. Lowering the outer end of the lever a given distance represented by the throw of the cam, rotates the lever head a given fraction of a revo- 25 lution, while the spring 19 lifts the said head into the position marked 16^b. The work is now placed between the rolls and the rotation of the cam moves the lever to gradually force the rolls together, and give a tapering form to the blade, which taper will vary according to 30 the distance that the rolls move towards each other when a blade of a given length is being rolled therein. In the diagram Fig. 3, a return movement of the lever-head over the fractional part of a revolution represented by 16^a and 16^b, will force the rolls together a 35 distance represented by the distance between 1 and 2. If the lever is adjusted so as to start the return or lifting movement of the lever with the links and lever-head in the position represented by 16^c and the lever is given the same amount of movement as before, it 40 will force the rolls down with the lever-head and links into the position represented by 16^b, moving them the distance represented by 3 and 1, which is about three times as much as when the lever-head is rotated the same part of a revolution with the adjustment first de- 45 scribed, thereby greatly increasing the taper of the blade rolled by one revolution of the rolls. As in my aforesaid patent, the abutment 17 will be adjusted by the set screws 18, to bring the rolls the desired distance from each other when the toggle links are at the last 50 end of their stroke. When the machine is set to bring the links into alinement at the last end of the stroke of the cam and toggle lever, the said lever and links have their greatest possible amount of reduction, and consequently impart the least amount of taper to the 55 blade that can be made with this particular cam. Suppose the cam lever is adjusted by dropping the outer end of the body of the cam lever to throw the links out of alinement at the last end of their stroke, or when the sub-lever rests on the point of the cam so 60 that the links have a still greater degree of inclination at the beginning of their stroke, then with the same movement of the cam and lever the reduction of the motion of the cam will be less than before and conse-

quently the effective stroke of the links will be greater so that a given length of blade passing through the 65 rollers will be rolled with a greater taper. This less reduction of the motion of the cam and greater throw of the links for forcing the rolls together is illustrated in Fig. 3 by the movement of the lower end of the lower link from 3 to 1. 70

It may be noted that when the two parts of the lever are firmly drawn together by the bolt 35 as shown in Fig. 1, the set screw is practically idle, that is the parts in that position will be held precisely the same without the set screw. The set screw is useful only to take up 75 the slack when the nut 38 on the bolt is loosened to let the two parts separate more or less. The bolt 35 as shown in Fig. 1 constitutes a breakable relief connection. It should also be noted that the cam 22 is an actuator for imparting a definite stroke to the part 80 which it drives, that is, the lever 21—34. This lever always moves a given distance or stroke for every revolution or stroke of this actuator.

It is apparent that some changes may be made from the specific construction herein disclosed, and I desire 85 the liberty of making such changes, in working my invention, as may fairly come within the spirit and scope of the same.

I claim as my invention.

1. The combination of a frame with the rolls mounted 90 therein, one of the said rolls being movable to and from the other, a cam mounted in the frame separately from the said rolls, toggle links and a lever having a head at one end lying between the said links and by which the lever is 95 fulcrumed, the other end of the said lever being acted on by the said cam and means for adjusting the axial position of the said head without changing the throw of the lever as acted upon by the said cam.
2. The combination of rolls relatively movable to and from each other with a cam moving in connection with 100 the said rolls, toggle links acting to force the said rolls together, a two-part lever for operating the said toggle links, one part of which lever bears upon the said cam and the other part of which lies between the inner ends of the said toggle links for operating them, and means for 105 adjusting the position of that part of the said lever that lies between the inner ends of the said links, for varying the angles that the said links will have at both ends of their stroke as operated through the said lever and cam.
3. In a machine for rolling tapering blades, the combi- 110 nation of a pair of rolls movable one towards the other, a cam moving in unison with the said rolls, mechanism for forcing the said rolls together, and a lever for operating the said mechanism, the said lever consisting of a lever body connected with the said mechanism for forcing the 115 rolls together, a sub-lever hinged to the said body and extended to bear upon the said cam, a bolt passing through the said body and sub-lever to limit their separation, and a set screw to limit their movement towards each other.
4. In a machine for rolling tapering blades, the combi- 120 nation of the rolls relatively movable to and from each other, mechanism for forcing the said rolls together, a lever for actuating the said mechanism consisting of a body portion connected with the said mechanism for forcing the rolls together and a sub-lever mounted thereon, an 125 actuator acting upon the said sub-lever, and means for adjustably connecting the said body portion and sub-lever together and which also serves as a breakable connection.

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