2 Sheets—Sheet 1.

H. F. & J. D. SNYDER.

SHINGLE-MACHINES.

No. 175,578. Patented April 4, 1876.

Fig: 1.

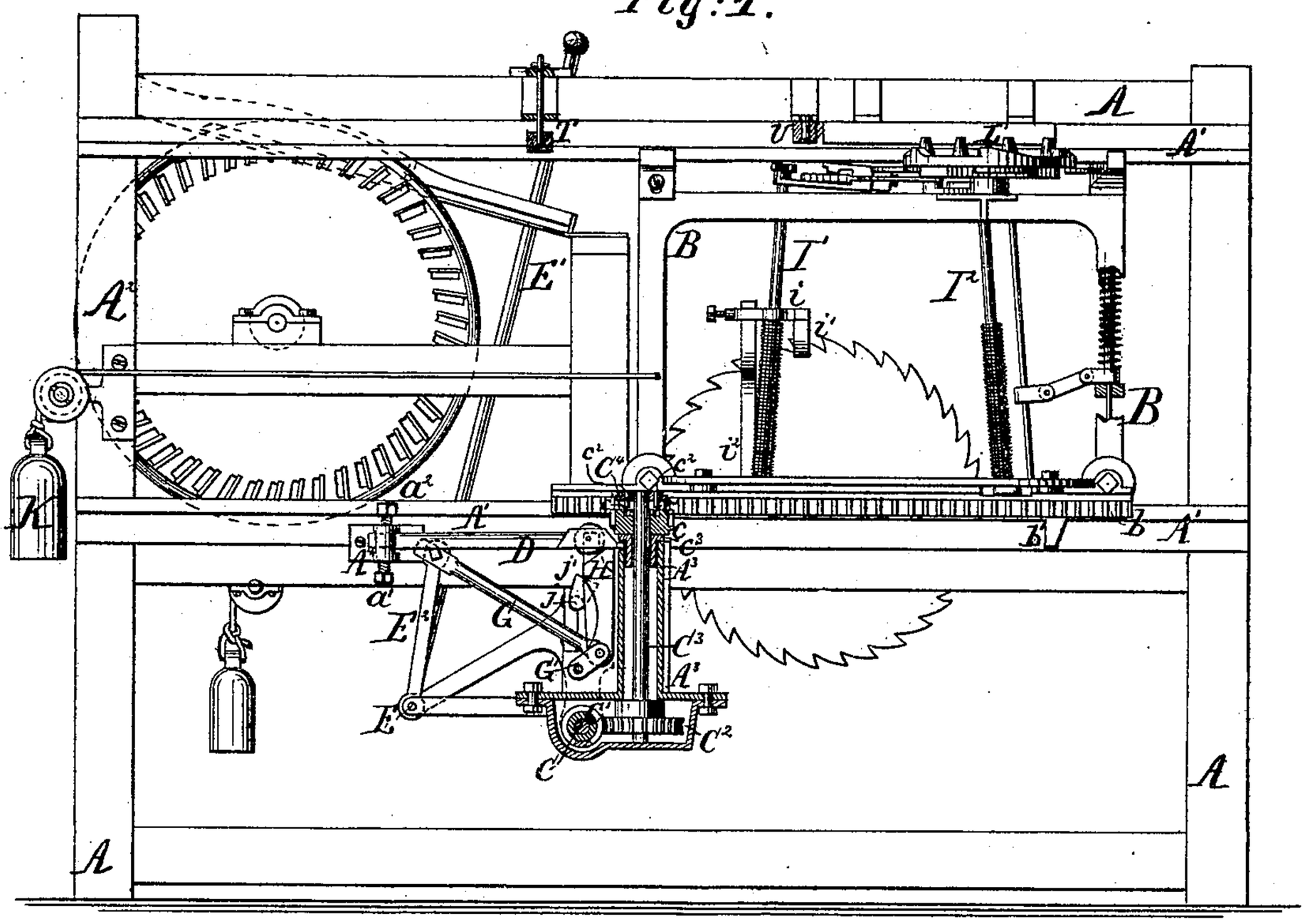


Fig: 2.

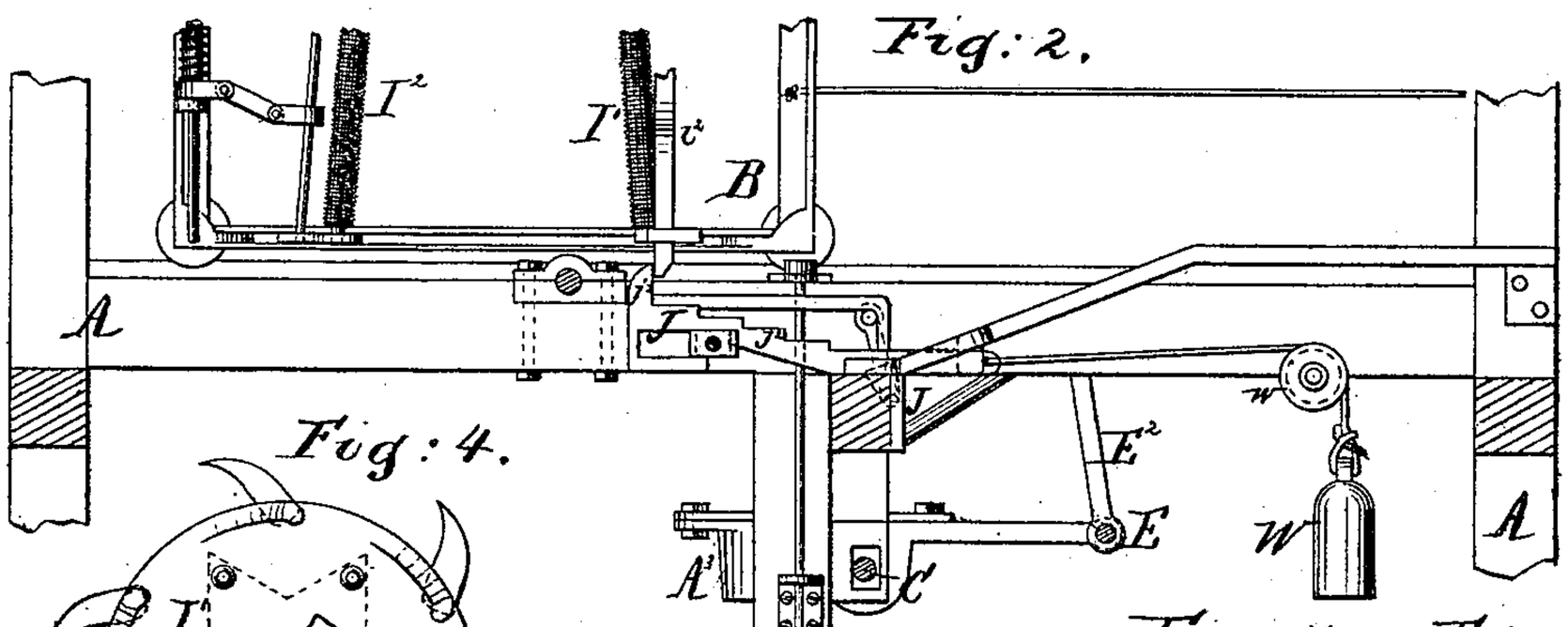


Fig: 4.

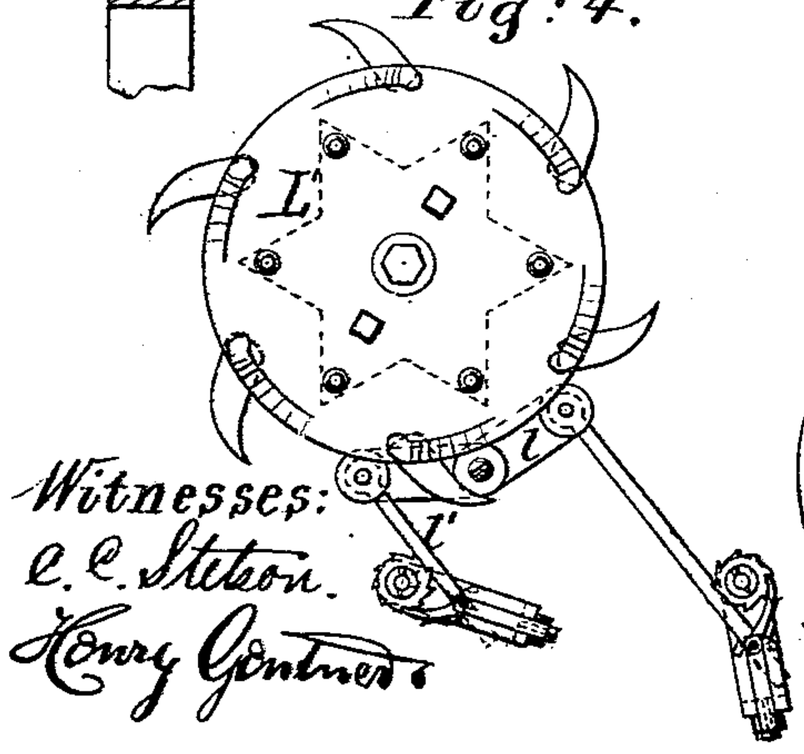


Fig: 5

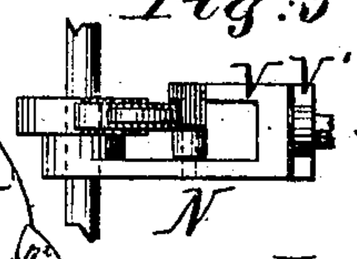
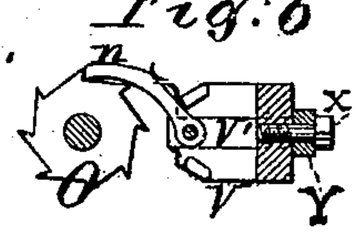
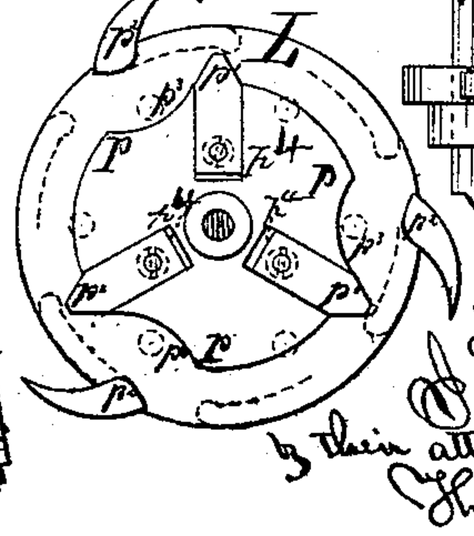


Fig: 6





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by their attorney
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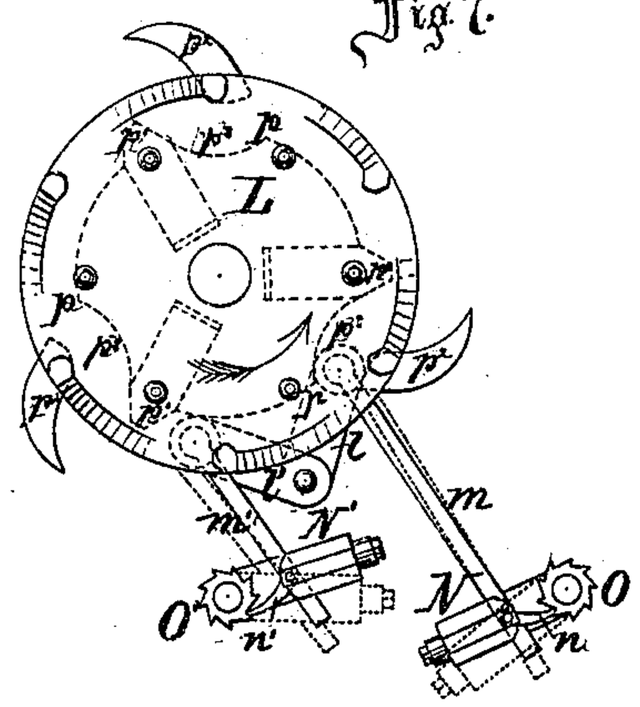
2 Sheets—Sheet 2.

H. F. & J. D. SNYDER.

SHINGLE-MACHINES.

No. 175,578. Patented April 4, 1876.

Fig. 7.



Old Wheel.

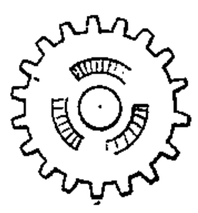
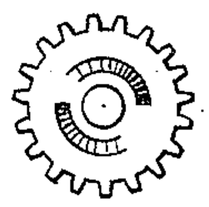


Fig: 8.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY F. SNYDER AND JESSE D. SNYDER, OF WILLIAMSPORT, PA.

IMPROVEMENT IN SHINGLE-MACHINES.

Specification forming part of Letters Patent No. **175,578**, dated April 4, 1876; application filed December 9, 1875.

To all whom it may concern:

Be it known that I, HENRY F. SNYDER and JESSE D. SNYDER, both of Williamsport, Lycoming county, in the State of Pennsylvania, have invented certain new and useful Improvements in Shingle-Machines; and we do hereby declare that the following is a full and exact description thereof.

The accompanying drawings form a part of this specification, and represent what we consider the best means of carrying out the invention.

Figure 1 is a front elevation. Fig. 2 is a vertical section of the central portion of the machine. Fig. 3 is the star-wheel, detached. Fig. 4 is the box board wheel, for sawing parallel. Fig. 5 is the adjustable lever, known as dog-fly. Fig. 6 is a horizontal section of Fig. 5, seen from below. Fig. 7 shows the mode of operating the rolls, which hold the block by means of the star-wheel. Fig. 8 shows the wheel which imparts motion to the carriage which supports the wood-block. Diagram "old wheel" shows the wheel which was used instead of our improved wheel, shown in Fig. 8.

Similar letters of reference indicate like parts in all the figures.

The general construction and mode of operation resembles that which is described in the Patent to S. J. Parker, No. 38,329, April 28, 1863, and all the parts not otherwise described will be understood to be the same as in the said Parker machine.

A is the fixed frame-work of our machine. It has ways A^1 A^1, which form guides for the carriage B, which supports the block from which the shingles are sawed. The carriage is driven slowly forward to present the block properly to the saw by means of a rack, *b*, at the base of the carriage. The cap or clutch-head C^4 is fixed on an upright shaft, C^3, which latter, by means of the pinion C^2 and endless screw C^1, receives motion from the main shaft C. A pinion, *c*, is mounted on the shaft C^3, and is capable not only of being revolved independently thereof, but also of being moved up and down thereon to a limited extent. It is formed with two cavities, c^1, on its upper face, which, when it is raised to a sufficient extent, engage with two pins, c^2, projecting downward from the clutch-head C^4. The pinion *c* is, under all circumstances, engaged with the rack *b*, and partakes of its forward and backward motion. The pinion *c* rests on a collar, c^3, which, during a portion of the time, rests on the fixed hollow casting A^3, and which, during another portion of the time, is strongly held up at a high level to hold the recesses c^1 in the pinion *c*, engaged with the pins c^2 in the cap C^4. H is a lifting-link, subject to peculiar motions. It is a principal agent in lifting the adjustable bar D, which engages under the collar c^3. G′ is a link, of which there are two, one in front and one in rear of the lifting-link H, and which is thrown into different angular positions by the agency of the connection G, actuated by the arm E^2 fixed on the shaft E, which shaft may be turned by the long hand-lever E^1. The position of the lower end of the lifting-link H is thus controlled by the turning of the shaft E. This is useful whenever it is desired to change the motion of the carriage B by hand. The upper end of the same link H is moved to the right and left by other agencies. The stop b^1 on the carriage B strikes it and moves it to the left. The arm j' on the shaft *j* moves it at the proper time in the opposite direction. The upper end of the lifting-link H is beveled off, and, as it moves to the left, acts wedge-wise under an anti-friction roller, *d*, in the bar D.

The point of lifting on the bar D is the center of the axis of the roller—that is, a distance from the point of bearing where it lifts under the collar c^3. It follows that the height to which its movement will lift the collar c^3 may be adjusted very delicately by raising or lowering the other end of the bar D. We provide for adjusting this by holding the other extremity of the bar D in an opening or slot in the arm A^4, extending out from the framing A. The bar D is held in the slot in the arm A^4 of greater depth than the corresponding part of the bar D, and it may be adjusted up and down in this slot by means of the adjusting-screws a^1 a^2. The intention is to hold that end of the bar D with only sufficient looseness or play to allow the other end to be raised.

When the carriage B moves into its extreme left position, or nearest the upright A^2

of the frame-work, the projection b^1 pushes the upper end of the lifting-link H to the left. This raises the bar D, which, being thus lifted, raises the collar c^3 and pinion c. This allows the pins c^2 to engage with the cavities c^1, and now pinion c rotates with the shaft C^3, and moves the carriage B forward to the right against the saw.

J is a piece adapted to slide longitudinally within the frame-work, and formed with offsets or steps on its upper side. It is drawn in one direction by the gravity of the weight W, connected by a cord over a pulley, w. It is moved in the other direction by the finger i^2, carried on the carriage B. It is peculiarly mounted on the mechanism which holds the block, so that its height depends on the size of the block, and it strikes different steps or offsets on the slide J, according as the size of the block calls for a greater or less amount of motion of the carriage. The block is firmly held in position by spurred or roughened rollers I^1 I^2. On the roller I^1 slides a horizontal piece, i, the position of which is determined by the height of the block through the finger i^1, projecting downward and resting on the top of the block. Another rod, i^2, projects from the piece i inside of the frame work.

After the carriage B has passed the saw, and one shingle is cut off, the rod i^2 strikes against a projection, j^2, on the sliding piece J, and pushes this sliding piece a little forward. This movement turns, by means of an arm, the rock-shaft j, which, having on its other end also an arm, pushes down the lifting-link H. The rod D, collar c^3, and pinion c, consequently, sink, and then pinion c, disengaging from the cap C^4, allows the weight W to pull the carriage B back to the left. When the same has nearly reached the post A^2 of the frame-work, the projection b^1 on its base strikes the upper end of the lifting-link H, pushing it to the left. This, acting on the roller in the bar D, throws the pinion c into connection with the cap C^4, and the carriage B commences again to move to the right. Thus, the working of the machine goes on automatically. At the same time when the carriage goes back, the weight W pulls back the sliding piece J. This allows the rocking shaft j to be turned into its original position by the raising of the lifting-link H.

We mount the bearings of the rollers I^1 I^2 so that the upper ends of said rollers are nearer to each other than the lower ends. By holding the upper edge of each block very firm, even if sawed a little out of true, prevents the saw from disturbing the position of the upper part of the block. Without this arrangement of the upper ends of the rollers I^1 I^2 nearer together than the lower ends, the block is liable to be tipped or rolled a little, thus making the shingles thinner on one side than on the other side. At the top, on one side of the carriage, we provide a star-wheel, L, of the form shown in Fig. 3. The motion of this star-wheel operates a system of levers by which the rollers I^1 I^2 are turned. When the carriage B starts from the post A^2 on its movement toward the saw, the star wheel L is partially turned by the drop-roller T, (see Fig. 1,) and in turning it pushes out the levers l l', (see Fig. 7,) which push the adjustable levers m m', and thus the dog-flies N N'. These latter, by the dogs n n' and ratchets O and O', turn the rollers I^1 I^2. The blocks being held by these rollers is forced out toward the saw, one end about four (4) times as much as the other end. At the next forward movement the other end is thrown out the farthest. In this operation the star-wheel L, (see Fig. 7,) is turned in the direction indicated by the arrow. The point p pushes out the lever l, and lever l being connected, by the adjustable connection m, with the dog-fly N throws the latter in the position indicated by the dotted lines. At the same movement of the star-wheel the lever l' is thrown out, and pushes the dog-fly N' into the position indicated by dotted lines. The block now strikes the saw, and while the saw passes through the block the star-wheel L strikes the roller U, (see Fig. 1,) which turns it around, so that one of the three points p^1 stands in the same position with regard to the lever l as it did before with regard to the lever l', and the hook p^2 pulls lever l' into the hollow p^3. The carriage now runs back to the post A^2, and repeats the movement, as above described, except that the point b' (see Fig. 7) pushes out the lever l, and the lever l' is thrown out of the hollow p^3. There being three points, p^1, and three hollows, p^3, in the star-wheel L, the levers l l' are pushed alternately by the points p^1. The thick end of a shingle is always produced at the roller which is operated by the point p^1. It is sometimes desirable to vary the thickness of one or both ends of the shingles. This can be effected by lengthening or shortening the distance from the center of the ratchet O O' to the point in which the connections m m' are pivoted to the dog-flies N N'. The shorter the distance the farther the roller will be turned around, and, vice versa, the longer the distance the less the roller will be turned. This distance is lengthened or shortened by unscrewing one of the screws X, and in putting a washer, Y, between the body V of the dog-fly and the sliding part V'. When in the manufacture of other articles than shingles parallel pieces are to be sawed, the wheel L' (see Fig. 4) is used in place of the wheel L, and performs important functions. The wheel L' has six points, six hollows, and six hooks. (See Fig. 4.) Both levers l and l' are pushed out the same distance at the same time, which movement turns the rollers I^1 I^2, both evenly pushing out the block at both ends the same distance. The wheel L' is turned in the same manner as the wheel L by the drop-rollers T and U. When it strikes the roller U, (see Fig. 1,) it turns, and the hooks p^3 (see Fig. 4) pull the levers l l' back into the hollows, where they remain until the carriage B has run back

to the post A^2, (see Fig. 1,) and shortly after it has commenced its forward movement the wheel L′ strikes the drop-roller T, and the levers are again thrown out. The thickness of the pieces sawed is regulated by attaching to the body of the wheel L′ a star with long or short points.

We attach much importance to the number of pins in the clutch C^4. The collar c^3 must fit more or less loosely both in the hollow casting A^3 and on the shaft C^3. When only one pin in the clutch C^4 catches in a cavity in the pinion c, it crowds all these parts out of position. In each case when the bar D drops the collar c^3 and its connections, the parts are liable to stick, and will not drop promptly; but with an even number of pins, c^2, and corresponding cavities c^1, the parts are forced up squarely, and drop the moment they are liberated. We employ always an even number.

We claim as our improvements in shingle-machines—

1. The adjustable screws a^1 a^2, in combination with the bar D and gear-wheel c, so as to throw the latter to an adjustable height to strike clutch-head C^4, and allow for wear, as herein specified.

2. The dog-fly N, composed of the adjustable parts V and V′, as herein described, and for the purpose specified.

3. The wheel L′, having slots p^4 adapted to receive longer or shorter star-points p^1 at will, as and for the purposes specified.

In testimony whereof we have hereunto set our hands this 15th day of October, 1875, in the presence of two subscribing witnesses.

HENRY F. SNYDER.
JESSE D. SNYDER.

Witnesses:
N. D. CRAIN,
H. D. HEISER.