N° 8955 A.D. 1903

Date of Application, 21st Apr., 1903

Complete Specification Left, 21st Jan., 1904—Accepted, 24th Mar., 1904

PROVISIONAL SPECIFICATION.

Improvements in Stone Sawing Machinery

We, ARTHUR GEORGE GRICE and GEORGE ANDERSON AND COMPANY, LIMITED, both of Taymouth Engineering Works, Carnoustie, in the County of Forfar, Scotland, Engineers. do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements in stone sawing machinery. Its objects are to facilitate and and minimise the cost of sawing and moulding stone, granite, marble, carbon, and like substances, and allow of larger blocks being dealt with, and to independently vary the forward and backward motions of the feed table or tables,—the speed of the saw preferably remaining constant.

In carrying out our invention we provide a rigid foundation framing, above and on which the feed table or tables traverse on rollers by means of a nut and screw, such screw being actuated by bevel wheels from a cross shaft independently of each other. Upright brackets supported by and at each side of the foundation framing carry pillow blocks and bearings in which the shafts rotate, which carry the band pulleys. These band pulleys are set with their centres running vertically through each other, or horizontally according as to which type of saw is used; and which depends upon the blocks to be sawn or moulded. In the vertical type the band pulleys would be practically fixed as to the position of their shafts, but in the horizontal type suitable means of raising and lowering the band pulleys by nuts and screws actuated by a bevel wheel and cross shaft are provided so as to cut any depth of slab. Tension gear will be fitted to fixed pulleys actuated by double screws.

The band pulley shaft is driven by means of fast and loose pulleys in the usual way from the countershaft. A band of steel or iron is mounted on the band pulleys in the same manner as for cutting wood, and is fitted along one or both edges with diamonds welded in removable sockets according to Anderson's Patent No. 12913 of 1899.

To keep the band from vibrating pads are fixed to the cross beams on one or both sides of the band. On the other extremity of the saw shaft is a pulley which actuates a countershaft, preferably near the floor, and on such shaft is a speed cone; actuating another cone on a parallel shaft through belting so as to drive such parallel shaft faster or slower as may be desired. This shaft drives another by means of a disengaging pinion on such parallel shaft, and a wheel on the driven shaft, the driven shaft being that which actuates the screws of the feed table by means of bevel wheels as previously explained. The shaft, which directly actuated the feed table screw may be made to directly rotate in the one direction or the other by means of open or cross belts, and fast and loose pulleys actuated from same countershaft.

When the shaft is being rotated in this manner the pinion on the adjacent shaft is disengaged. By these means the feed table may be slowly moved towards the saw or it may be more quickly moved towards or away from it as may be required.

[*Price 8d.*]

Water is led to the saw by pipes, and is kept within bounds by means of a cover going over the under band pulley and shaft bearings.

The feed table is provided with a trough all round for catching the sand and water, and arranged with a continuous fall to one end so that the water and other refuse may flow into a received to be used over again.

Dated this 17th day of April 1903

GEO. C. DOUGLAS & Co.,
Chartered Patent Agents,
41 Reform Street, Dundee, Agents for Applicants.

COMPLETE SPECIFICATION.

Improvements in Stone Sawing Machinery.

We, ARTHUR GEORGE GRICE, and GEORGE ANDERSON AND COMPANY LIMITED, both of Taymouth Engineering Works, Carnoustie, in the County of Forfar, Scotland, Engineers. do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in stone sawing machinery. Its objects are to facilitate and minimise the cost of sawing and moulding stone, granite, marble, carbon, and like substances, and allow of larger blocks being dealt with, and to independently vary the forward and backward motions of the feed table or tables—the speed of the saw preferably remaining constant.

And in order that our said invention and the manner of performing or carrying the same into effect or practice may be properly understood, we have hereunto appended an explanatory sheet of drawings in which the same reference numerals are used to indicate corresponding parts in all the figures where shown, that is to say:—

Figure 1. is a side elevation of a machine showing a stone in position on its carriage and the saw ready to commence operations.

Figure 2. is a view of same looking in the direction of the arrow A. (Figure 1.)

Figure 3. is a plan of same.

Figure 4. is a detail drawing showing the band saw on its pulley, and

Figure 5. is a part side elevation of the band saw with diamonds and holders in position.

In carrying out our invention, we provide a rigid foundation framing 6 above which are pillars 12 on which the feed table or tables 7 slide by means of nuts 8 and screws 9, such screws being actuated by bevel wheels 10 from cross-shafts 11. These upright brackets or pillars 12 supported by and at each side of the foundation framing 6, which is not shown specially in the drawings, carry the tables 7 on which are the pillow blocks 13 and bearings in which the shaft 14 rotates, 15 being a fixed stud which carries one of the band pullies 16. These band pulleys are set with their centres running vertically through them—as in the drawings—or horizontally according as to which type of saw is used and which depends upon the blocks to be sawn or moulded. In the vertical type the band pulleys would be practically fixed as to the position of their shaft 14 and stud 15 but in the horizontal type suitable means of raising and lowering the band pulleys by nuts and screws actuated by bevel wheels, and cross shafts are provided so as to cut any depth of slab. Tension gear may be fitted to fixed pulleys actuated by double screws.

The pulley shaft 21 is driven by means of a pulley 17 in the usual way by a

belt from the countershaft 18 and by means of the belt 22 and pullies 23 and 46 the band pulley shaft 14 is rotated. A band of steel or iron 19 is mounted on the band pulleys in the same manner as for cutting wood, and is fitted along one or both edges with diamonds welded in removeable sockets 20 according to Anderson's Patent No. 12913 of 1899.

To keep the band 19 from vibrating, pads are fixed to the cross-beams on one or both sides of the band. The saw band 19 is moved towards or away from the article being cut by means of the open and crossed belts 24 and 25 which can actuate a fast pulley 26 on the shaft 27 causing it to rotate in the one direction or the other. These belts are controlled by a hand lever 28 which operates another 29 pivoted at 30 the latter actuating the slide rod 31 on which are the belt forks. The lever 32 controls the clutches 33 and 34 by means of the lever 45 also pivoted at 30 causing the one to become engaged and the other disengaged, or *vice versa*. 35 is an adjustable crank on the shaft 27 and it can operate a ratchet wheel 36 by means of the connecting rod 37 and ratchet lever 38. This ratchet wheel operates the shaft 39 and through it the pinion 40, wheel 41, one of the cross-shafts 11, the chain 42, and the other cross-shaft 11 thus operating the feed tables 7. When the clutch 34 is in gear the other clutch 33 is out of gear and the pinion 43 drives the wheel 41 directly, thus quickly raising or lowering the feed tables. When the clutch 33 is in gear the other 34 is out of gear and the ratchet wheel 36 through the shaft 39 and pinion 40 actuates the wheel 41 causing the feed to operate slowly.

Water is led to the saw by pipes, and is kept within bounds by means of a suitable cover.

The carriage 44 on which the stones are laid and carried may be provided with a trough all round for catching the sand and water and arranged with a continuous fall to one end so that the water and other refuse may flow into a receiver to be used over again.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

(1.) In apparatus of the kind herein referred to the use of a band of flexible metal which carries diamonds set in holders as described and for the purposes set forth.

(2.) In apparatus of the kind herein referred to wherein stones and the like are sawn or moulded, the combination of a band saw which carries diamonds set in holders with means for operating same, as described and illustrated on the drawings annexed.

(3.) In apparatus of the kind herein referred to the construction, combination and arrangement of parts as described and illustrated on the drawings annexed.

Dated this 18th day of January 1904.

GEO. C. DOUGLAS & Co.,
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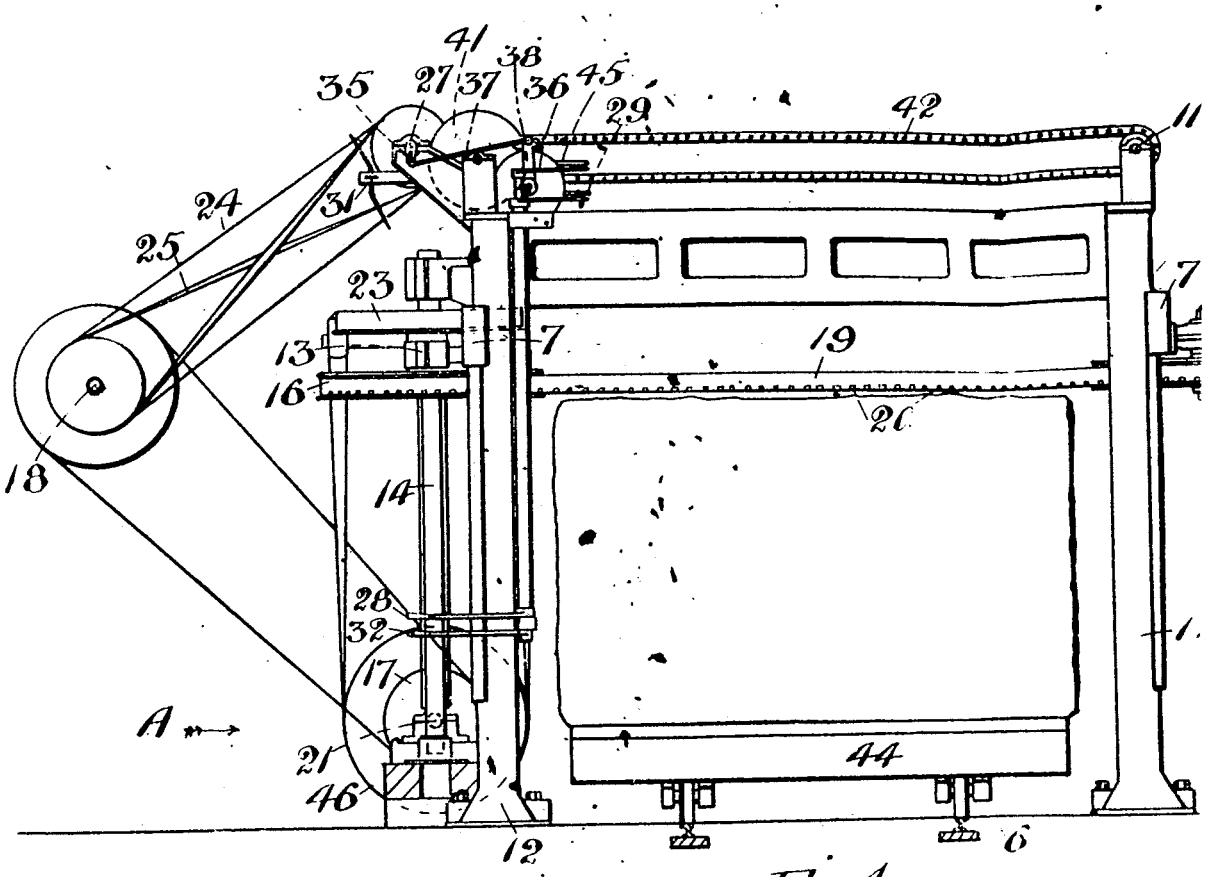

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Fig. 1.

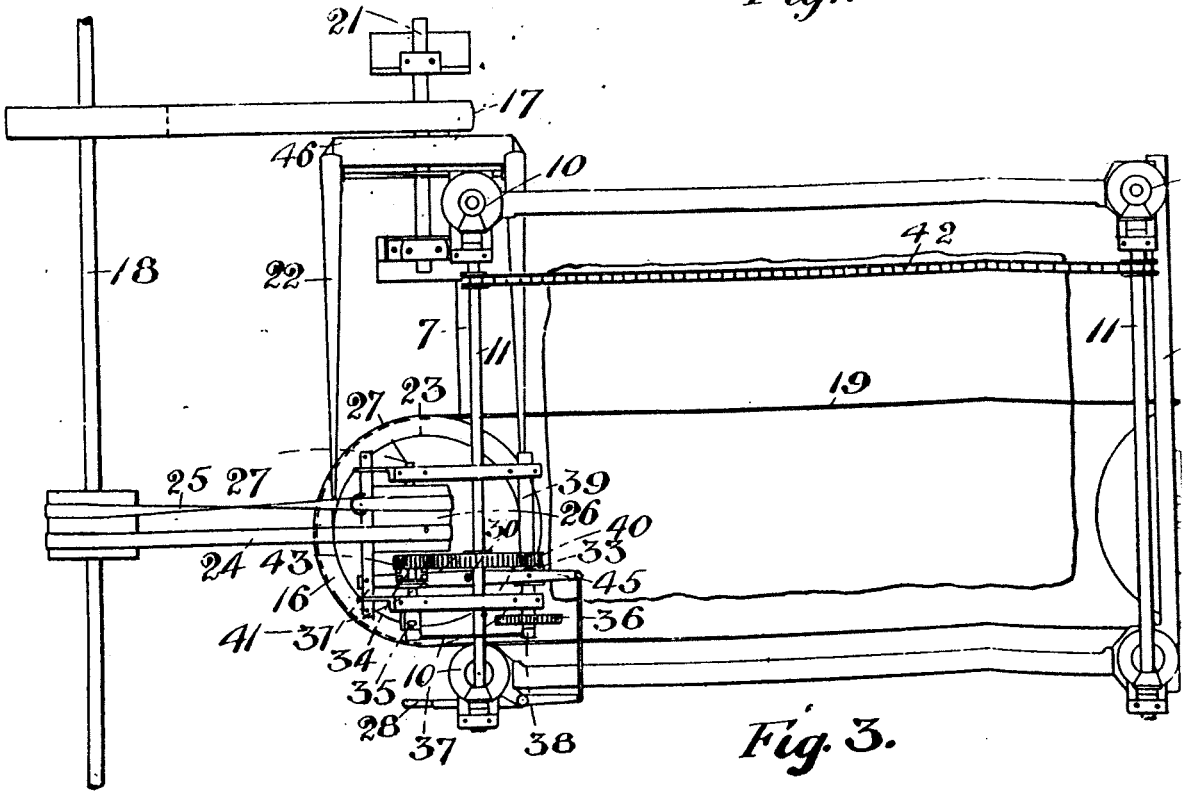

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Fig. 3.

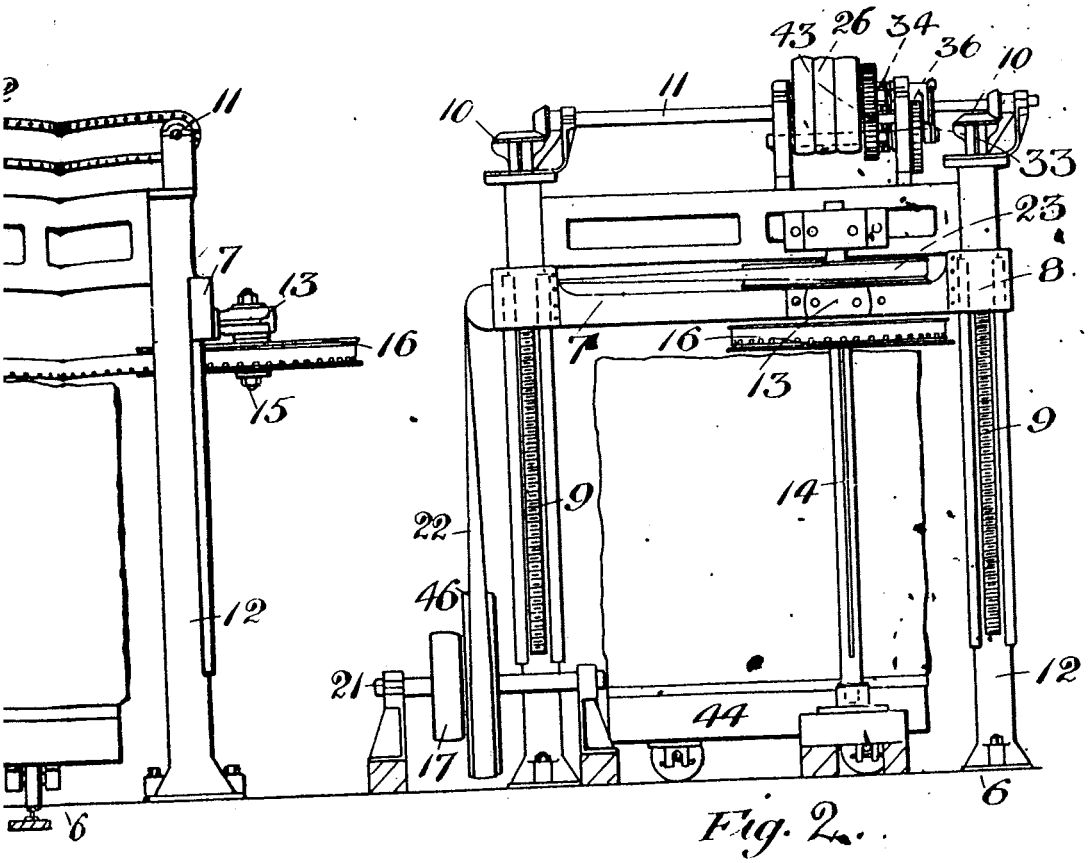
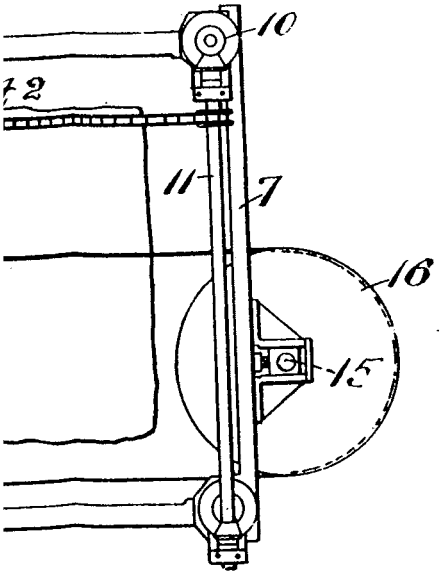


Fig. 2.



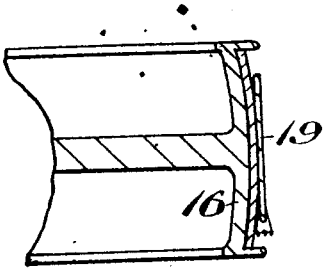


Fig. 4.

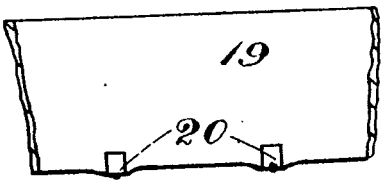


Fig. 5.

[This Drawing is a reproduction of the Original on a reduced scale]

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