

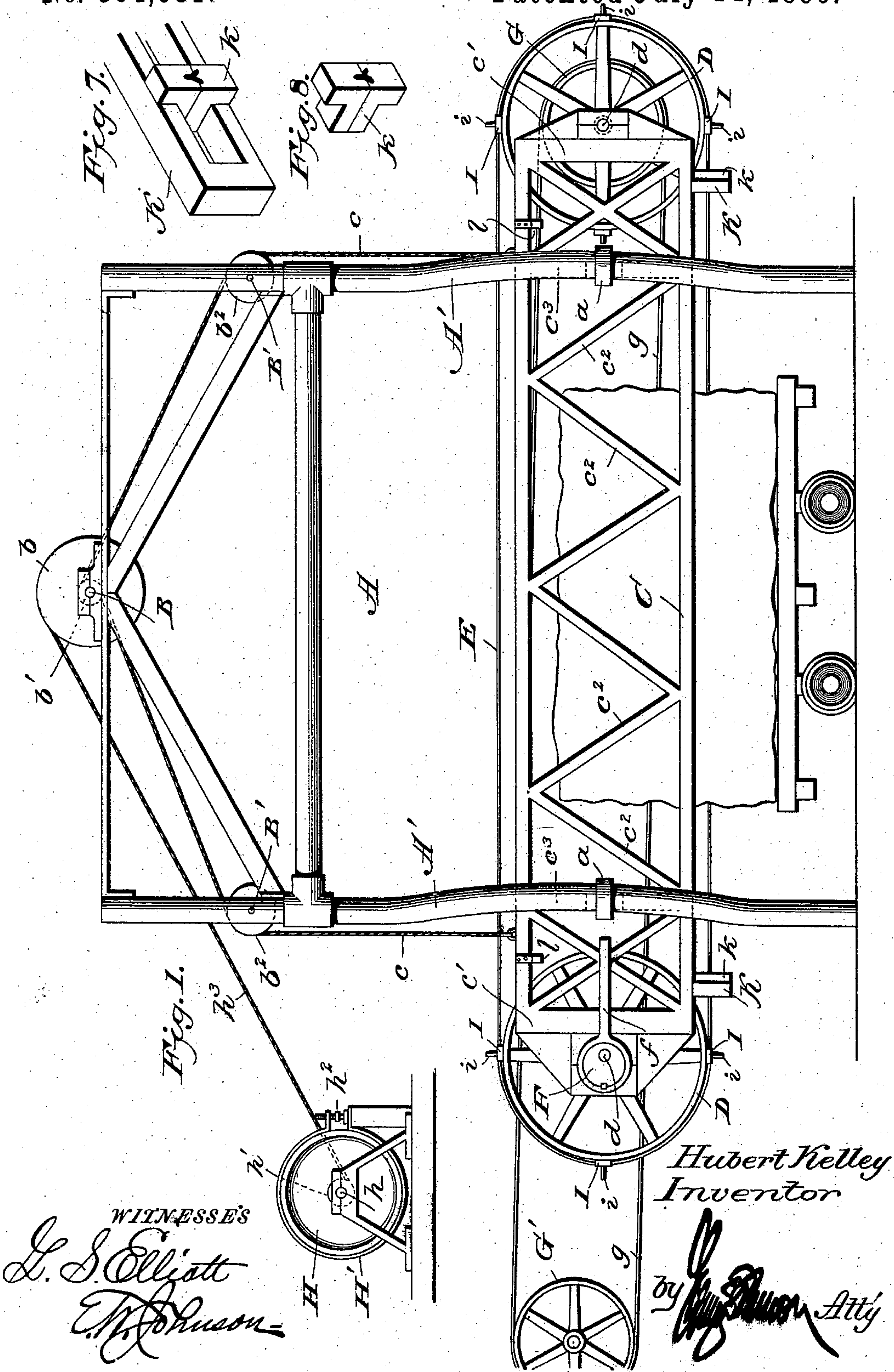
(No Model.)

2 Sheets—Sheet 1.

H. KELLEY.
MACHINE FOR SAWING STONE.

No. 564,081.

Patented July 14, 1896.



WITNESSES
L. S. Elliott
M. Johnson

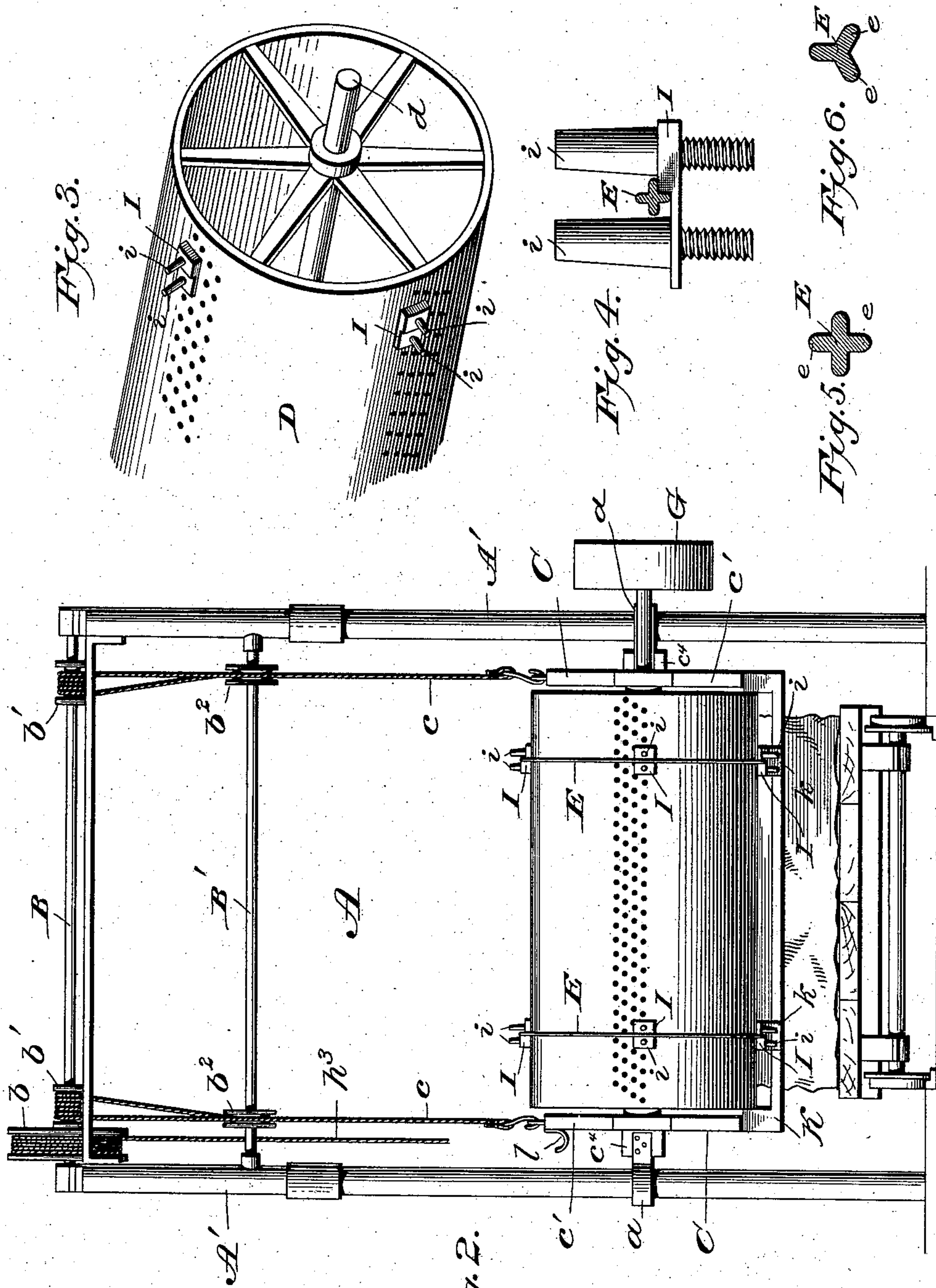
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Fig. 2.

Hubert Kelley
INVENTOR

by *[Signature]*
Attorney

UNITED STATES PATENT OFFICE.

HUBERT KELLEY, OF WEST RUTLAND, VERMONT.

MACHINE FOR SAWING STONE.

SPECIFICATION forming part of Letters Patent No. 564,081, dated July 14, 1896.

Application filed November 29, 1895. Serial No. 570,462. (No model.)

To all whom it may concern:

Be it known that I, HUBERT KELLEY, a citizen of the United States of America, residing at West Rutland, in the county of Rutland and State of Vermont, have invented certain new and useful Improvements in Machines for Sawing Stone; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide an improved stone-sawing machine, in which the frame carrying the endless saws is supported by cables extending from a tension device and is guided by vertical posts of peculiar construction, which provide for keeping the driving-belt at all times taut, the endless saws being constructed to present wings, which are radial in cross-section and twisted to give said wings a spiral motion when in use, and the drums around which the saws pass are provided with adjustable plates for guiding said saws, additional guides being employed for giving axial rotation to the saws.

The invention consists in the construction and combination of the parts, as will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a stone-sawing machine constructed in accordance with my invention. Fig. 2 is an end elevation. Fig. 3 is a detail perspective view of one of the drums over which the endless saws pass. Fig. 4 is a detail view of one of the guide-plates and pins which are attached to the drums. Figs. 5 and 6 are sectional views of the endless saws. Fig. 7 is a detail perspective view of one of the guide-bars through which the saws pass, and Fig. 8 is a detail view of one of the blocks carried by the guide-bars.

A designates the main frame, which consists of four posts or uprights A', which are curved or bent as shown in Fig. 1, the bends extending in the same direction or away from the driving-pulley, for the purpose hereinafter set forth. The posts or uprights A' are

connected to each other at their upper ends by cross-bars and diagonal brace-bars to present a rigid structure. The upper end of the frame A is provided centrally with a transverse shaft B, upon which are mounted a comparatively large drum *b* and two smaller drums *b'* *b'*, and between the posts A' of the frame are journaled transverse shafts B', carrying guide-rollers *b*².

C designates the saw-carrying frame, which is located within the frame A and is supported by flexible connections *c*, which extend therefrom over the guide-pulleys *b*² and are wound around the drums *b'* on the transverse shaft B, the flexible connections which are attached to the same side of the saw-carrying frame being both wound upon the adjacent drum *b'*, but in opposite directions, so that when the saw-carrying frame is being lowered the flexible connections will be paid out equally.

The saw-carrying frame is made up of side pieces or frames consisting of longitudinal beams connected to each other at their ends by pieces *c'* and intermediately by diagonal bars *c*² and vertical strips *c*³, said side pieces or frames being connected by transverse shafts *d*, which are journaled in the end pieces *c'* and have mounted thereon the drums D, over which pass the endless saws E. One of the transverse shafts *d* is journaled in slotted bearings in the end pieces *c'*, and the ends of said shaft engage eccentrics F, which are provided with handles *f*, so that by turning the eccentrics the drum on the shaft can be moved to tighten or loosen the endless saws. The other shaft *d* extends beyond one side of the saw-carrying frame and is provided with a pulley G, over which passes a belt *g* from a driving-pulley G', said driving-pulley being located beyond the end of the frame A opposite the end adjacent to the shaft carrying the pulley G, this arrangement being for the purpose hereinafter set forth.

The saw-carrying frame is connected to the posts or uprights A' by means of collars *a*, which are placed on said posts and have inwardly-projecting portions which are bolted to projections *c*⁴ of the vertical strips *c*³, and these collars act to guide the saw-carrying frame when it is raised and lowered. It will be here noted that by curving the posts A',

as shown in Fig. 1, the driving-belt *g* will be kept taut, as the saw-carrying frame is given a slight longitudinal movement as it is raised and lowered, the curve of the posts being on the segment of a circle the extent of which is determined by taking the pulley *G'* as the center and the farthest posts *A'* as the periphery.

The descent of the saw-carrying frame is partially regulated by a tension device consisting of a suitably-supported shaft *h*, having a drum *h'* and a disk *H*, around the disk being placed a band *H'*, which is drawn in frictional contact therewith by a screw *h*². The drum *h'* is connected to the drum *b* on the transverse shaft *B* by means of a flexible connection *h*³, which is wound around both drums. By this arrangement the rotation of the shaft *B*, from which extend the supporting-cables *c* of the saw-carrying frame, is regulated so that in operation the whole weight of said saw-carrying frame will not come upon the saws.

The saws *E* are constructed to present wings *e*, which are radial in cross-section and are twisted to form spirals, and these saws pass over the drums *D* and are guided thereon by plates *I* and their retaining-pins *i*. The upper part of the pins *i* are tapered and their lower ends are threaded to engage threaded apertures in the drums, and said threaded apertures are arranged in series, as shown in Figs. 2 and 3, to provide for a minute adjustment of the plates. By tapering the upper part of the pins this construction presents a grip to prevent the saw slipping upon the drums.

K designates the guide-bars which give axial rotation to the endless saws, these guide-bars being secured to the under side of the saw-carrying frame, and are each made up of two pieces or strips, so as to leave a space between them in which are placed blocks *k*, consisting of two sections having recesses, which when the sections are placed together will correspond with the configuration of the saws.

It will be noted that as the saws pass through the openings in the guide-bars *K*, or blocks *k* thereof, said saws will be given an axial rotation in the same manner as a screw passing through a correspondingly-threaded aperture.

In placing the saws in position upon the drums *D* the collars *a* on the side of the frame *A* opposite the pulley *G* are detached from the saw-carrying frame and the saws which are suspended from the hooks *l* may be allowed to drop below the projections *c*⁴, after which the collars *a* are attached to the saw-carrying frame. The saws are then in position to be readily placed over the drums by simply unhooking the supporting-cables *c*. The hooks *l* also provide a means for supporting saws which are not desired for immediate use but which will be in position to be readily placed upon the drums when required.

In operation the stone to be cut is placed on a truck or car and moved under the saw-

carrying frame. The saws are then placed in proper position upon the drums by properly adjusting the guide-plates *I* and are also placed in engagement with the blocks *k* of the guide-bars *K*. The proper tension is now placed upon the shaft *B* by the tension device *H* and the saws set in motion by the driving-pulley *G*, and as the saws pass through the blocks *k* of the guide-bars *K* they will be given a slight axial rotation which will constantly change the cutting-surfaces of the saws and will act to better feed the sand or abrading material to the surface being cut. As the saw-carrying frame descends it will be caused to move in the segment of a circle by means of the guide-posts *A'* and thus act as an automatic belt-tightener for the driving-belt *g*.

The saws constructed as herein shown and described possess many advantages over the usual saw made up of three or more strands of wire, as it can be used until the flanges or wings are entirely worn away, whereas with saws made up of strands of wire the saw becomes useless as soon as one of the strands is worn sufficiently to part, and it is exceedingly difficult to connect the ends of a composite wire saw.

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

1. In a stone-sawing machine, the combination with the saw-carrying frame having a pulley at one end, of guide-posts for said saw-carrying frame each having a portion thereof curved in the segment of a circle, the driving-pulley, as *G'*, being located beyond the guide-posts opposite those adjacent the pulley on the saw-carrying frame, substantially as shown and for the purpose set forth.

2. In a stone-sawing machine, the combination with the saw-carrying frame having drums, as *D*, with series of threaded perforations in the periphery thereof, of guide-plates *I* having retaining-pins *i* with threaded ends adapted to engage the threaded perforations in the drums, substantially as shown and for the purpose set forth.

3. In a stone-sawing machine, the combination with the saw-carrying frame having drums and endless saws which pass over said drums and are made up to present laterally-extended wings, of guide-bars *K* having blocks *k* with perforations corresponding with the configuration of the saws, substantially as shown and for the purpose set forth.

4. In a stone-sawing machine, the combination with the saw-carrying frame, of drums *D* mounted in said frame and provided with series of threaded apertures, and plates with retaining-pins which engage said threaded apertures; together with guide-bars *K* having blocks *k* with apertures corresponding with the configuration of the saws, substantially as shown and for the purpose set forth.

5. In a stone-sawing machine, the combination with the saw-carrying frame, of guide-

bars K made up of two pieces leaving a space between them, and blocks $\frac{1}{2}$ adapted to be placed between the pieces of the guide-bars, said blocks consisting of two sections having 5 recesses which when the sections are placed together form perforations corresponding in shape with the transverse section of the saws, substantially as shown and for the purpose set forth.

10 6. In a stone-sawing machine, the combination, of drums having perforations as shown

for the reception of pins; shouldered guide-plates attached to the drum by means of pins, said pins having tapered portions which project beyond the guide-plate; together with 15 saws, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HUBERT KELLEY.

Witnesses:

SYLVESTER J. LALOR,
JAS. C. GILLESPIE.