E. W. HOWELL.

ROPE BINDING MACHINE.

APPLICATION FILED JAN. 24, 1918.

1,289,178.

Patented Dec. 31, 1918.

3 SHEETS—SHEET 1.

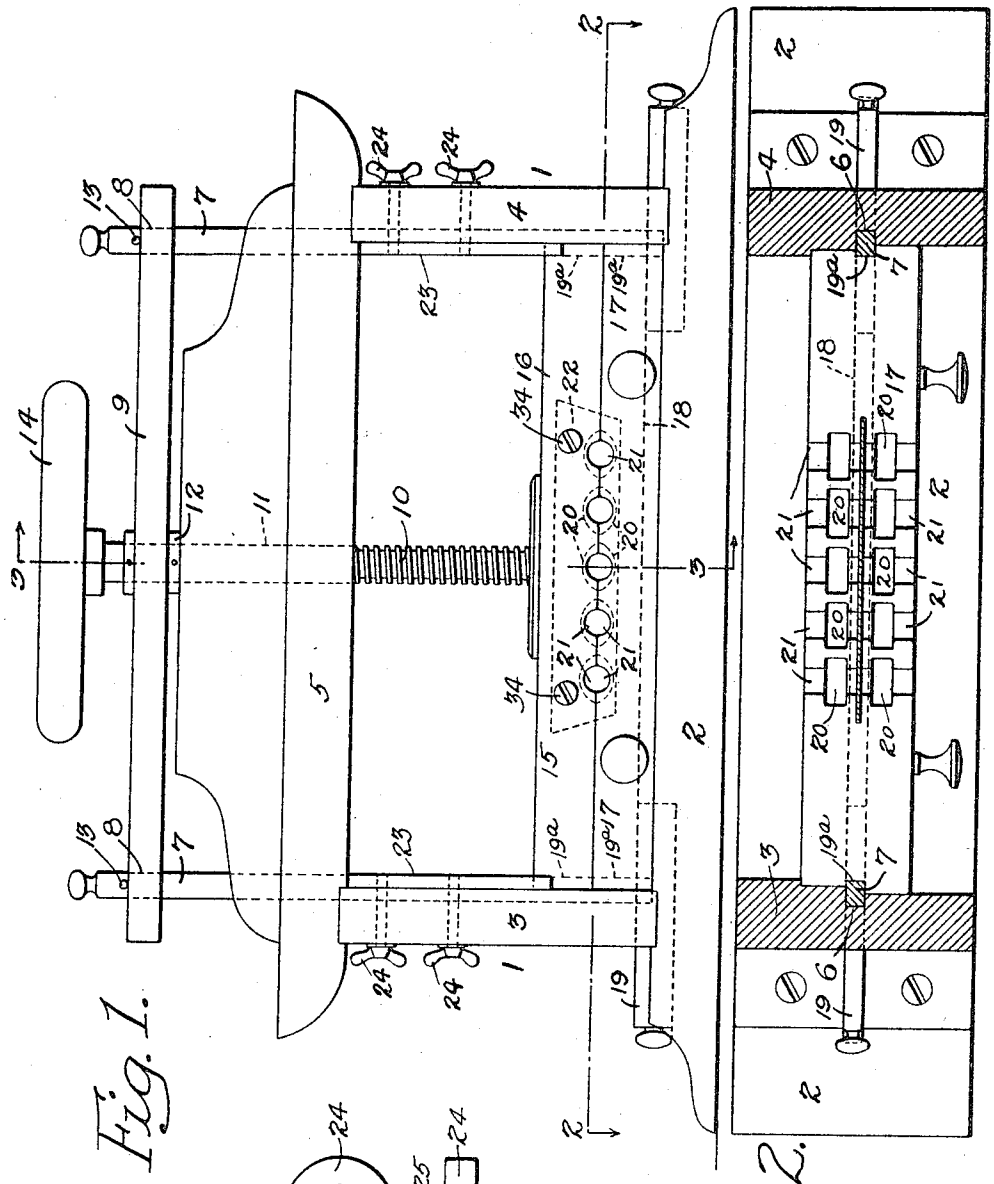

Fig. 1.

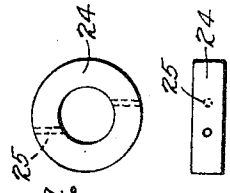

Fig. 4.

Fig. 5.

Fig. 2.

Witnesses,
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Fig. 3.

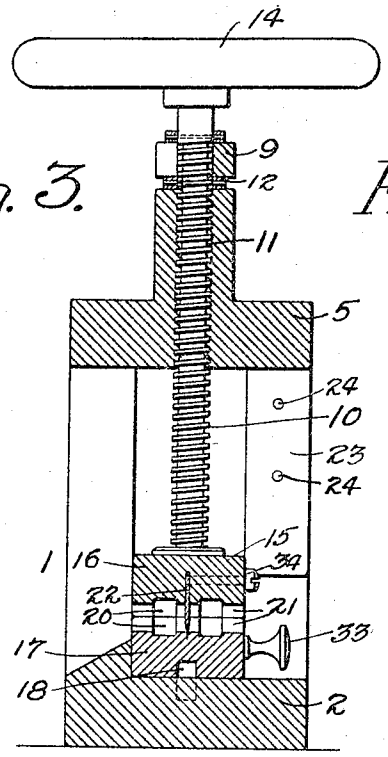


Fig. 7.

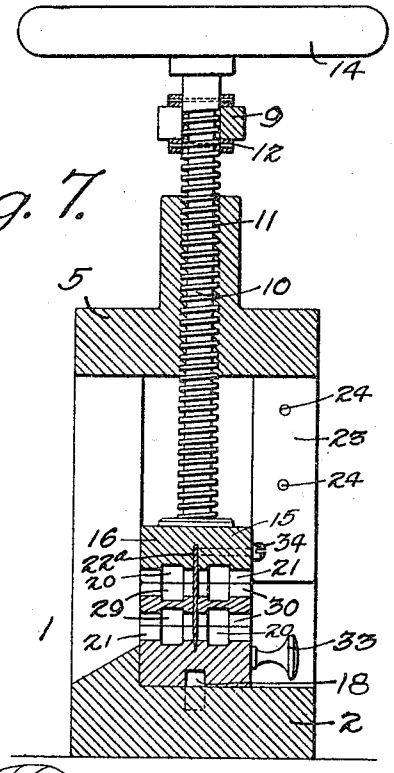


Fig. 9.

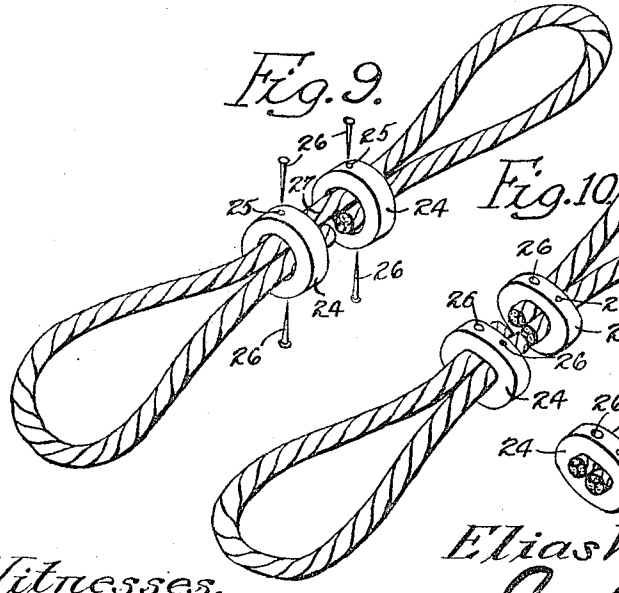
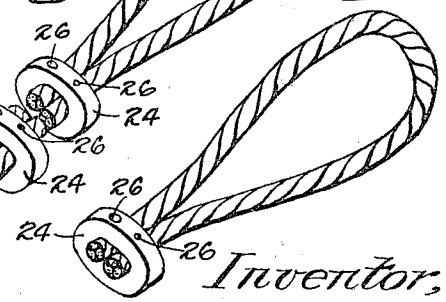


Fig. 10.

Fig. 11.



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3 SHEETS—SHEET 3.

Fig. 6.

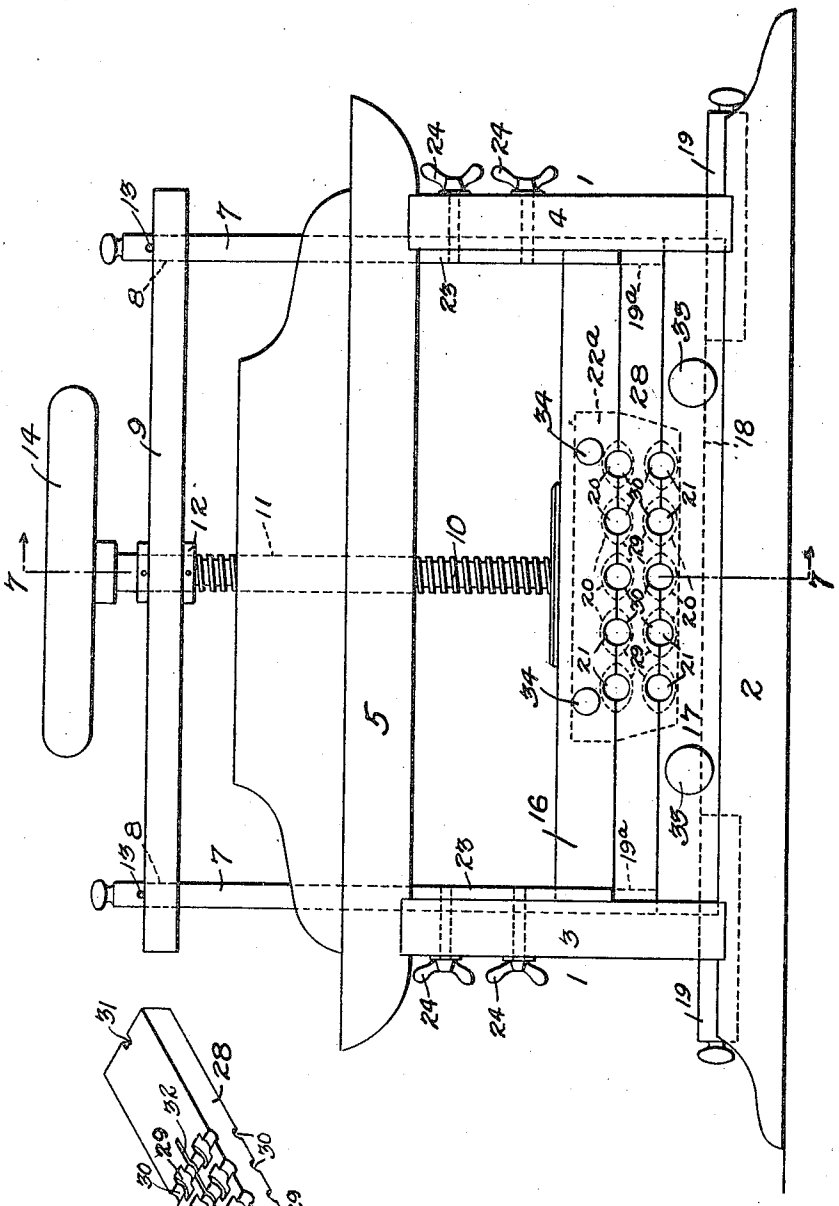
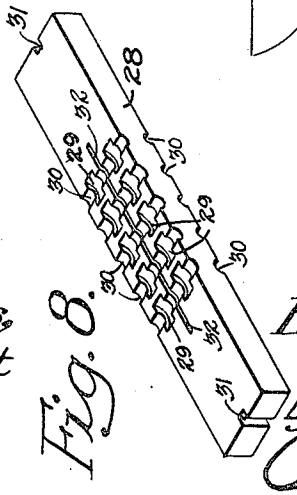


Fig. 8.



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UNITED STATES PATENT OFFICE.

ELIAS W. HOWELL, OF CAMDEN, NEW JERSEY.

ROPE-BINDING MACHINE.

1,289,178. Specification of Letters Patent. Patented Dec. 31, 1918.

Application filed January 24, 1918. Serial No. 213,604.

To all whom it may concern:

Be it known that I, ELIAS W. HOWELL, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Rope-Binding Machines, of which the following is a specification.

One object of my invention is to provide a machine which will securely bind together the ends of rope so as to form strong and durable loops, such for example as covered in my United States Patent No. 1,265,661 of May 7, 1918, said loops being well adapted for use on the stake ropes of tents or for any other purpose where a strong loop is desired.

Another object is to so construct my improved machine that it will produce the above mentioned loops without wasting any rope, since all the rope necessary to form the loop will be included in the finished loop thereby doing away with the great waste of rope necessary in tying loops of the above described type by hand, as is usually done.

A further object is to design my improved machine in such manner that it will make a number of the loops at one operation of the machine.

A still further object is to make my improved machine of simple and durable construction and so that it can be quickly and easily operated.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which—

Figure 1 is a front elevation of my improved machine,

Fig. 2 is a sectional plan view taken on the line 2—2 of Fig. 1,

Fig. 3 is a transverse sectional elevation taken on the line 3—3 of Fig. 1,

Fig. 4 is a side elevation of a securing band which I preferably use in my improved machine for binding the rope,

Fig. 5 is a top view of Fig. 4,

Fig. 6 is a front elevation of my improved machine of similar nature to Fig. 1 but showing the same including a supplementary die block which is employed when it is desired to increase the capacity of the machine,

Fig. 7 is a sectional elevation taken on the line 7—7 of Fig. 6,

Fig. 8 is a perspective view of the supplementary die block illustrated in Figs. 6 and 7,

Fig. 9 is a perspective view showing how a piece of rope is provided with the securing bands illustrated in Figs. 4 and 5 and prior to inserting the same within my improved machine,

Fig. 10 shows the same rope after having been operated upon by my improved machine and showing how two complete loops are formed from a single piece of rope, and

Fig. 11 is a perspective view of one of the finished loops.

Referring to the drawings, 1 represents a frame, preferably of metal, which includes a base 2, upright posts 3 and 4 which are secured to the base, and a head 5 mounted on and secured to the tops of the posts 3 and 4. Each of the posts 3 and 4 is grooved vertically as at 6 to provide slideways for two bolts 7, said bolts being slidable within said grooves and through the head 5. The upper end portions of the bolts 7 slide through holes 8 in a beam 9 mounted above the head 5.

A clamping screw 10 fits a screw-threaded hole 11 in the head 5 and passes through the beam 9. A collar 12 is interposed between the beam 9 and the head 5 and the bolts 7 have pins 13 adapted to engage the upper surface of the beam 9 so that when the latter is raised the bolts 7 will also be raised for a purpose hereinafter described. The upper end of the clamping screw 10 is provided with a hand wheel 14 and the lower end of this screw is attached to an upper section 15 of a die block 16, the lower section 17 of said die block being adapted to rest on the base 2 and has a groove 18 in its bottom into which laterally positioned bolts 19, in the base 2, are adapted to slide.

The opposite ends of the sections 15 and 17 of the die block 16 are notched, as shown at 19ª, so that when the bolts 7 are lowered they will engage in the notches 19ª and thereby prevent the die block sections from moving forwardly or rearwardly. Each of the die block sections 15 and 17 are provided with half elliptical recesses 20, there being five rows of these recesses, two recesses in a row, as illustrated in Figs. 1 to 5, inclusive. The recesses in the sections 15 and

17 register with each other to provide an elliptical chamber when the sections are together, as illustrated in Fig. 1. Furthermore, each of the sections 15 and 17 are provided with grooves 21 which are semicircular in cross section and communicate with the front and rear surfaces of the sections 15 and 17 and also communicate with the respective half elliptical recesses 20, as clearly shown in Figs. 2 and 3. The upper die block section 15 carries a knife 22 and the plane of movement of said knife passes between the recesses 20 of each row, as clearly shown in Figs. 2 and 3.

Guiding plates 23 are secured to the posts 3 and 4 by thumb screws 24 and serve as additional guiding means for the section 15 of the die block when the latter is raised and also serve as auxiliary securing means when one or more supplementary die blocks are employed, as illustrated in Figs. 6 and 7, the construction of which will be described hereinafter.

In operation the die block section 15 is raised by the manipulation of the hand wheel 14 and the strands of rope with the securing bands 24 thereon, as illustrated in Fig. 9, are placed within the respective recesses 20 and grooves 21 of the die block section 17. The securing bands 24 have nail holes 25 arranged off center, as clearly shown in Figs. 4 and 5, and nails 26 are inserted in these holes, the lower nails being inserted before the securing bands are placed within the recesses, as above described. When in this position the die block section 15 is lowered by turning the hand wheel 14 and as soon as the respective raised portions 20 of the section 15 engage the upper portions of the cylindrical securing bands 24 they will tend to flatten the same and drive the nails through the strands of rope and at the same time the knife 22 will engage and cut the connecting portion 27 of the rope which lies between the bands of each row.

By arranging the nail holes 25 off center, as clearly shown in Figs. 4 and 5, the nails in each securing band 24 will pierce the respective ends of the rope loops and thereby securely hold the rope ends within the securing bands. Sufficient pressure is applied to cause the bands 24 to assume the shape of the elliptical cavities produced jointly by the recesses 20 in the sections 15 and 17 so that the compressed securing bands 24 provide a neat end for the rope loops and firmly hold them together. It will be understood that when positioned between the die block sections the rope will occupy the space provided by the grooves 21 and the bands will neatly fit within the recesses so that they can be quickly and accurately placed in position within the machine.

In Figs. 6, 7, and 8 I have illustrated a supplementary die block 28 which has recesses 29 and grooves 30 in opposite surfaces thereof and these recesses and grooves are adapted to register with the recesses and grooves in the die block sections 15 and 17. The supplementary die block 28 is adapted to be interposed between the die sections 15 and 17 and has its opposite ends provided with notches 31 to permit the bolts 7 to pass therethrough. A slot 32 is also formed in the supplementary die block 28 to permit the knife 22^a to pass therethrough and down into the section 17 so as to cut all of the strands between the respective rows of securing bands. It is readily seen that by including the supplementary die block 28 the production of the machine can be doubled and if desired more than one supplementary die block may be employed.

To free the finished loops from the machine it is merely necessary to turn the hand wheel 14 and the die block section will be raised and with it the bolts 7 will be withdrawn by the engagement of the beam 9 with the pins 13 so that the several parts can be removed. Also if it is desired to remove the bottom die block section 17 the bolts 19 can be withdrawn and to facilitate the removal of the bottom section 17 of the die block I provide the latter with handles 33.

In order to permit the removal of the knives 22 and 22^a I provide the upper die block section 15 with set screws 34 so that the knife can be quickly removed either for sharpening or if it is desired to insert knives of different sizes, it being noted that when the supplementary die block is employed a deeper knife is necessary than when the supplementary die block is omitted.

While I have described my invention as taking a particular form, it will be understood that the various parts of my invention may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

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

1. A device for compressing bands into an elongated formation to bind together rope strands passing therethrough, including a die block having a recess of greater length than the width of the band before the latter is compressed and in which the band is adapted to seat; said die block being made in sections in which a part of the recess is in each section; and means for moving said sections together thereby compressing and flattening said band within said recess; said die block having a groove therein commu-

nicating with and in alinement with the axis of said recess and in which the rope strands fit, substantially as described.

2. A device of the character described including a die block made in sections, each section having a half elliptic recess formed therein and grooves communicating with said recesses, said sections being movable relatively to each other and adapted to bring said recesses and said grooves respectively into register with each other, substantially as described.

3. A device of the character described including a frame having posts spaced apart; a die block made in sections and mounted between the posts; bolts slidable into locking engagement with an upper section of the die block; means for moving said upper section of the die block toward and away from another section thereof; and means connecting said latter means with the bolts and whereby the latter are moved in conjunction with said upper section of the die block during its separating movement, substantially as described.

4. A device of the character described including a frame having posts spaced apart; a die block made in sections and mounted between the posts; bolts slidable into locking engagement with an upper section of the die block; means for moving said upper section of the die block toward and away from another section thereof; and means connecting said latter means with the bolts and whereby the latter are moved in conjunction with said upper section of the die block during its separating movement, said bolts being adapted to be independently slid with respect to the upper section of the die block either to disconnect them therefrom during the separating movement or to move them in an opposite direction prior to the movement of said upper section toward the second mentioned section of the die block, substantially as described.

5. A device of the character described including a frame having posts spaced apart and a head connected to said posts; a die block mounted between the posts; bolts adapted to be slid into locking engagement with the die block; means supported by said head for actuating the die block; a beam connected to said latter means and through which said bolts are adapted to freely slide; and means for limiting the sliding movement of said bolts relatively to the beam whereby a movement of the beam by said first means serves to withdraw the bolts from the die block, substantially as described.

6. A device of the character described including a frame having a base; two posts spaced apart and a head connecting the tops of the posts; a die block comprising an upper and a lower section, said lower section being adapted to rest on said base and having a groove therein; bolts adapted to slide laterally within said base and into said lower section; other bolts movable transversely to the direction of movement of said first bolts and adapted to slidably lock the upper die block section within the frame; and means for moving said upper die block section, substantially as described.

7. A device of the character described including a die block made in sections movable relatively toward and from each other, each of said sections having recesses spaced apart, the recesses of one section respectively registering with the recesses of the other section, said sections also having grooves leading to and communicating with the recesses; and a supplementary die block adapted to be interposed between said first sections and having recesses and grooves on its opposite faces adapted to register with corresponding recesses and grooves on said first sections, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELIAS W. HOWELL.

Witnesses:
CHAS. E. POTTS,
MARY A. INGLAR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."