C. G. JOHANNESMEYER.

DEVICE FOR STRETCHING SHEETS UNIFORMLY.

APPLICATION FILED JUNE 3, 1907.

902,494. Patented Oct. 27, 1908.

Fig. 1.

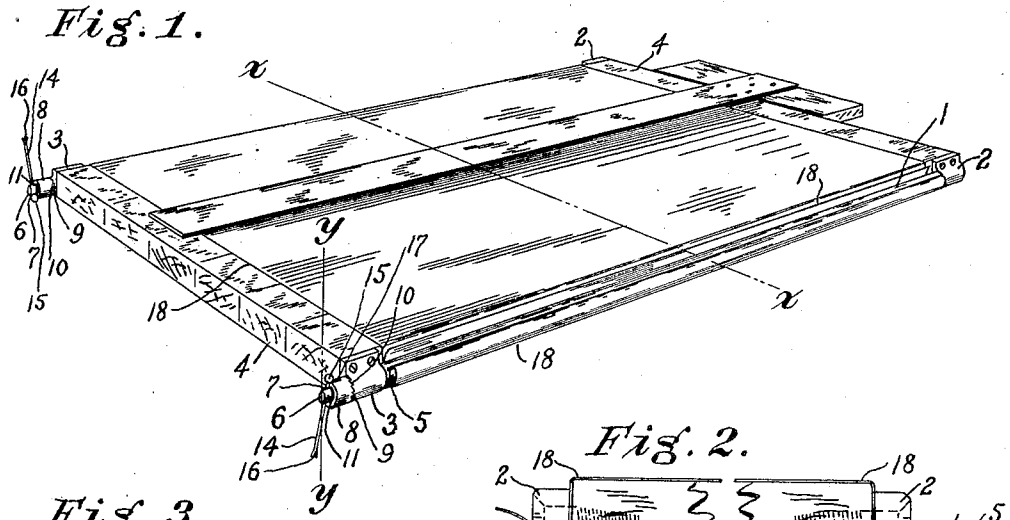


Fig. 2.

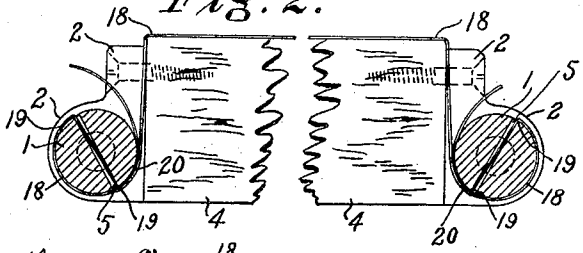


Fig. 3.

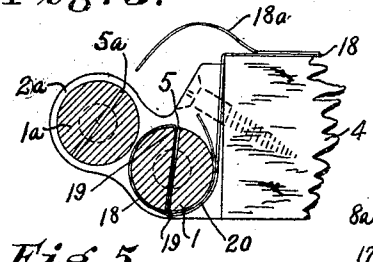


Fig. 4.

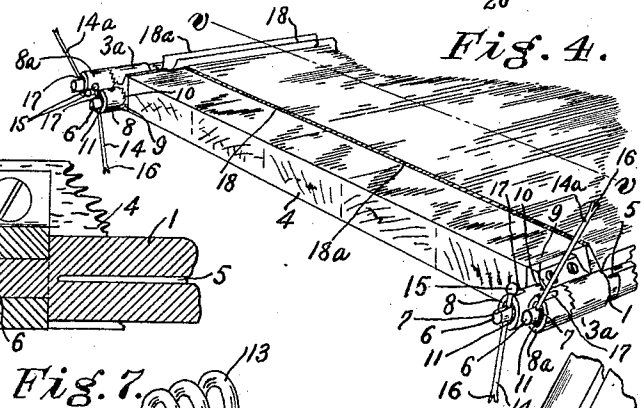


Fig. 5.

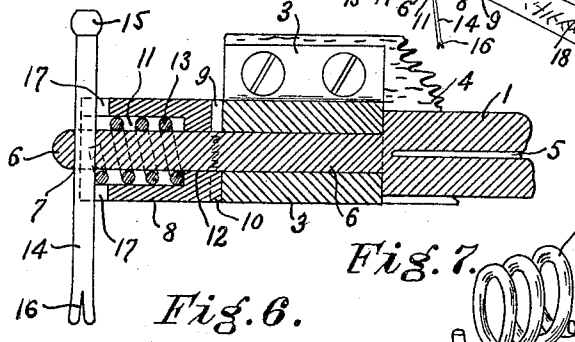


Fig. 6.

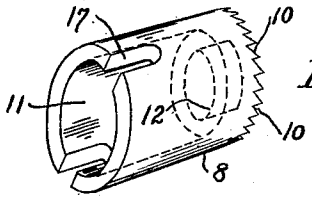


Fig. 7.

Fig. 8.

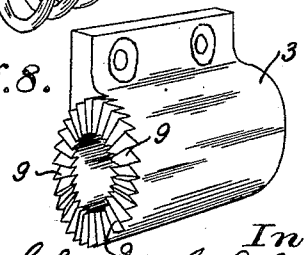
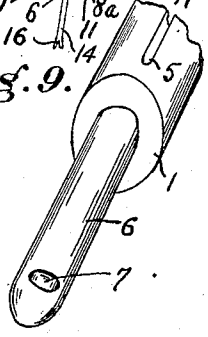


Fig. 9.



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DEVICE FOR STRETCHING SHEETS UNIFORMLY.

No. 902,494. Specification of Letters Patent. Patented Oct. 27, 1908.

Application filed June 3, 1907. Serial No. 376,925.

To all whom it may concern:

Be it known that I, CHARLES G. JOHANNESMEYER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Devices for Stretching Sheets Uniformly, of which the following is a specification.

My invention relates to means for stretching and fastening sheets and the object is to secure a sheet of material, upon which a drawing is to be made, over a flat surface, such as a drawing-board.

My invention consists in the combination with a drawing board of a shaft having a slot adapted to receive the end of the sheet, bearings for said shaft, and a holding and adjusting device for said shaft.

My invention also consists in the parts and in the details of construction and arrangement of parts as will hereinafter be more fully described and claimed.

In the drawing: Figure 1 is a rearward perspective view of a drawing-board equipped with my invention, showing the sheet stretched over the board, ready for use. Fig. 2 is a cross sectional view on a line corresponding to *x*—*x* of Fig. 1, the middle parts of the board and sheet being broken away. Fig. 3 is a partial cross section on a line corresponding to *v*—*v* of Fig. 4. Fig. 4 is a partial perspective view showing how a drawing board is equipped with my invention, for stretching and holding both the sheet which is to receive the preliminary drawing, and the sheet upon which the tracing is to be made from the preliminary drawing. Fig. 5 is a longitudinal section of part of the shaft, the bearing, and the holding and adjusting device. Fig. 6 is a detail perspective view of the ratchet collar. Fig. 7 is a detail perspective view of the spiral spring. Fig. 8 is a detail perspective view of the bearing provided with ratchet teeth. Fig. 9 is a detail perspective view of part of the shaft.

As I prefer to construct my invention, a shaft 1 is journaled in bearings 2 and 3, which are rigidly secured to the edge of the drawing board 4. The shaft 1 has the slot 5 extending transversely therethrough and longitudinally thereof, said slot terminating near the bearings 2 and 3 and the slot being made of sufficient length to receive a sheet of the maximum width to be used. The shaft 1 has journals of reduced diameter where it bears in the bearing 2 and 3, and the journal 6, which is mounted in the bearing 3, is prolonged past the outside end of the bearing 3. Near the outer end of this journal 6 is provided an opening 7 and the ratchet collar 8 is rotatably mounted on the prolongation of the journal 6. The bearing 3 is provided on its outer end with a series of ratchet teeth 9 and the ratchet collar 8 is provided on its inner end with a corresponding series of ratchet teeth 10, the ratchet teeth 9 and 10 being cut so that the ratchet collar 8 will be prevented from rotating in an outward direction from the board. The ratchet collar 8 is counterbored so that an annular recess 11 is provided extending from the bearing 12 of the ratchet collar 8 with the journal 6, outwardly, and in this recess 11 the spiral spring 13 is held by means of the pin 14 which extends through the recess 7 in the journal 6. The ratchet collar 8 is provided with the slot 17 to admit the pin 14 so that said ratchet collar 8 may be rotated with the shaft 1 by means of the pin 14 and at the same time be slidable on the journal 6. The spiral spring 13 thus acts by bearing rearwardly on the pin 14 and forwardly on the rearward part of the journal 12 to force the teeth 10 of the ratchet collar 8 into engagement with the teeth 9 on the bearing 3. The pin 14 is provided with a head 15 at one end and preferably is split at the other end as at 16, forming a spring which allows the pin to be removed from the recess 7 if desired, while at the same time preventing the pin 14 from falling out when in use.

When it is desired to stretch one sheet over the other without disturbing the first sheet, as when it is desired to make a tracing from a preliminary drawing already secured on the board, I provide an additional shaft 1^a which is mounted together with the usual shaft 1 in the modified bearings 2^a and 3^a, said bearing 3^a being provided with two series of ratchet teeth 9 and 9^a. In either case the bearings 2 or 2^a are similar to the bearings 3 or 3^a except that they are not provided with the ratchet teeth 9 or 9^a, respectively. Both the shafts 1 and 1^a are provided with ratchet collars 8 and 8^a respectively and the pins 14 and 14^a respectively, which are provided therewith, being slidable, either shaft can be operated without disturbing the other, as is best illustrated in Fig. 4 of the drawing.

In using my invention the end of the sheet is simply inserted in the slot of the shaft as is best illustrated in Fig. 3 where the sheet 18^a is about to be inserted in the slot 5^a of the

shaft 1[a]. The sheet is then drawn through a sufficient distance so that its free end will pass about half way around the shaft, and the shaft is rotated in the direction allowed by the ratchet so that the sheet is drawn under and around the shaft. By means of the ratchet the tension of the sheet may be adjusted, and when so adjusted the shaft will be held firmly in position, while the sheet, passing around the corners 19 of the edges of the slot, and bearing tightly against the convex surface of the shaft, will be held firmly in its stretched position. The friction thus tending to hold the sheet is greatly increased where the sheet bears on its free end, which was drawn through the shaft, as at 20. Thus the sheet will be held firmly without the use of any clamping device other than that afforded by the friction between its own members when it is thus inserted through the slot and drawn around the shaft, and the clamping device thus constituted has the advantage of being continuous and uniform throughout the width of the sheet. The shaft 1 being of sufficient stiffness to maintain its straightness when the sheet is thus stretched, and the edges of the slot and of the drawing-board being straight, the sheet will be stretched uniformly throughout its width, obviating the trouble experienced with the use of thumb-tacks, or other means of fastening, which act only at certain points. In addition to thus stretching the sheet uniformly and holding it securely, the simplicity of operation of my invention allows a saving of time in adjusting and securing the sheet upon the board, it only being necessary to insert the free end of the sheet squarely into the slot and turn the shaft toward the board, after which the other end of the sheet may be inserted similarly in the slot of the shaft at the other side of the board, and the shaft turned inwardly until the sheet has the proper tension.

While I have shown and described a peculiar construction herein, I do not wish to be understood as limiting myself to it, but

What I claim as new and desire to secure by Letters Patent is:

1. The combination with a drawing board having a straight edge, of a shaft adjacent to the straight edge and in the same horizontal plane as the drawing board and having a slot therein extending parallel to the straight edge of the drawing board, transversely through the shaft, bearings for the shaft, and an adjusting and holding device for the shaft adjacent to one of the bearings, the slot in the shaft terminating near the bearings, substantially as set forth and for the purposes specified.

2. In a device for stretching sheets uniformly, a shaft having a slot therein, bearings for said shaft, ratchet teeth on one of said bearings, a ratchet collar slidably mounted on said shaft and adapted to engage and disengage with said ratchet teeth on said bearing, and means for rotating said shaft whereby the tension of said sheet may be regulated, substantially as and for the purposes specified.

3. In a device for stretching sheets uniformly, a shaft having a slot extending transversely therethrough and longitudinally thereof, bearings for said shaft adjacent to which said slot terminates, ratchet teeth on one of said bearings, a journal for said shaft extending through said bearing, a ratchet collar mounted on said shaft, ratchet teeth on said ratchet collar adapted to engage with said ratchet teeth on said bearing, a recess in said journal, a pin extending through said recess and slidable therein, and a slot in said ratchet collar adapted to receive said pin whereby said ratchet collar may rotate with said shaft to regulate the tension of a sheet inserted into said slot in said shaft, or slide upon said shaft to release said ratchet teeth, substantially as and for the purposes specified.

4. In a device for stretching sheets uniformly, a shaft having a slot therein, bearings for said shaft, ratchet teeth on one of said bearings, a ratchet collar slidably mounted on said shaft and adapted to engage and disengage with said ratchet teeth of said bearings, means for rotating said shaft whereby the tension of said sheet may be regulated, a second shaft parallel to the above mentioned shaft, bearings for said second shaft adjacent to the above mentioned bearings, ratchet teeth on one of said bearings for said second shaft, a ratchet collar slidably mounted on said second shaft and adapted to engage and disengage with said ratchet teeth on said bearing for said second shaft, and means for rotating said second shaft without interfering with said means for rotating the first mentioned shaft whereby the tension of a sheet inserted into said slot in said first mentioned shaft may be regulated and whereby the tension of a second sheet inserted into said slot in said second shaft may be regulated and said second sheet secured over said first mentioned sheet without disturbing the position of the first mentioned sheet, substantially as and for the purposes specified.

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