A. W. McCURDY.

SHEET UNITING DEVICE.

APPLICATION FILED JUNE 12, 1917. RENEWED DEC. 9, 1919.

1,350,371. **Patented Aug. 24, 1920.**

2 SHEETS—SHEET 1.

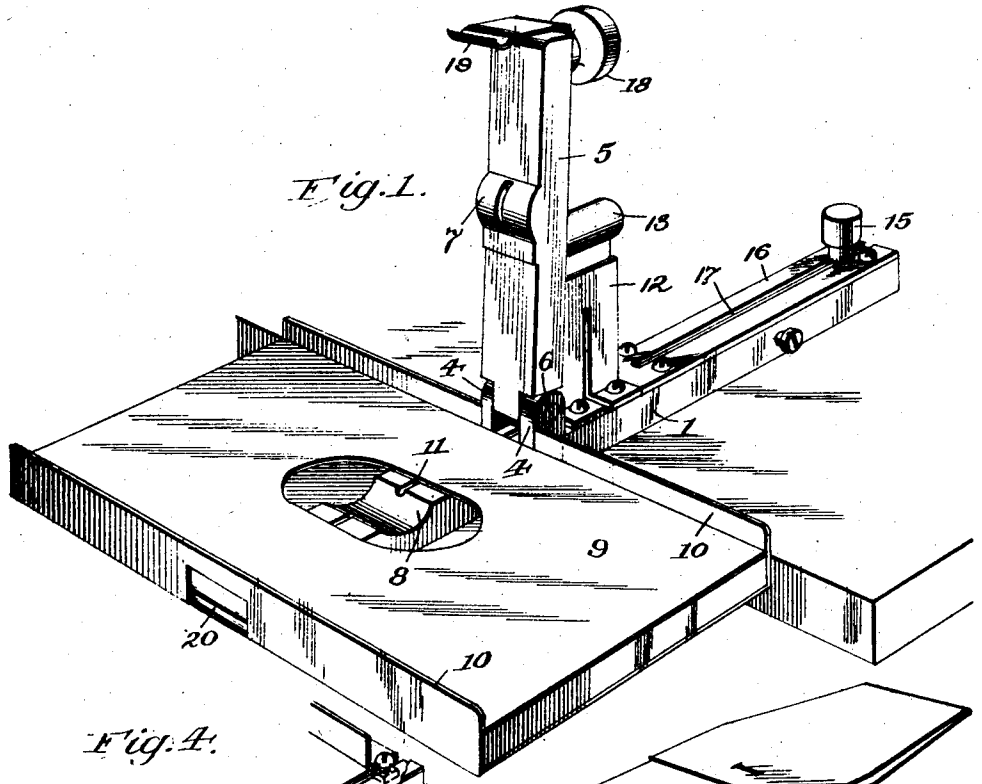


Fig. 1.

Fig. 4.

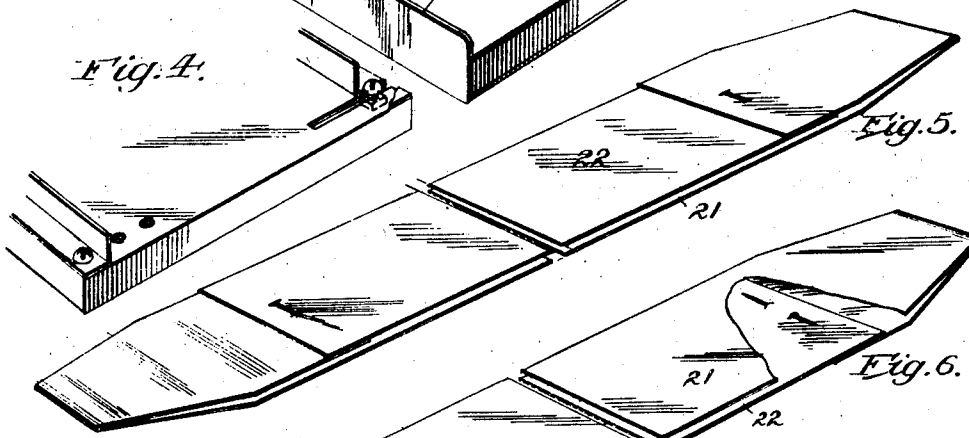


Fig. 5.

Fig. 6.

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2 SHEETS—SHEET 2.

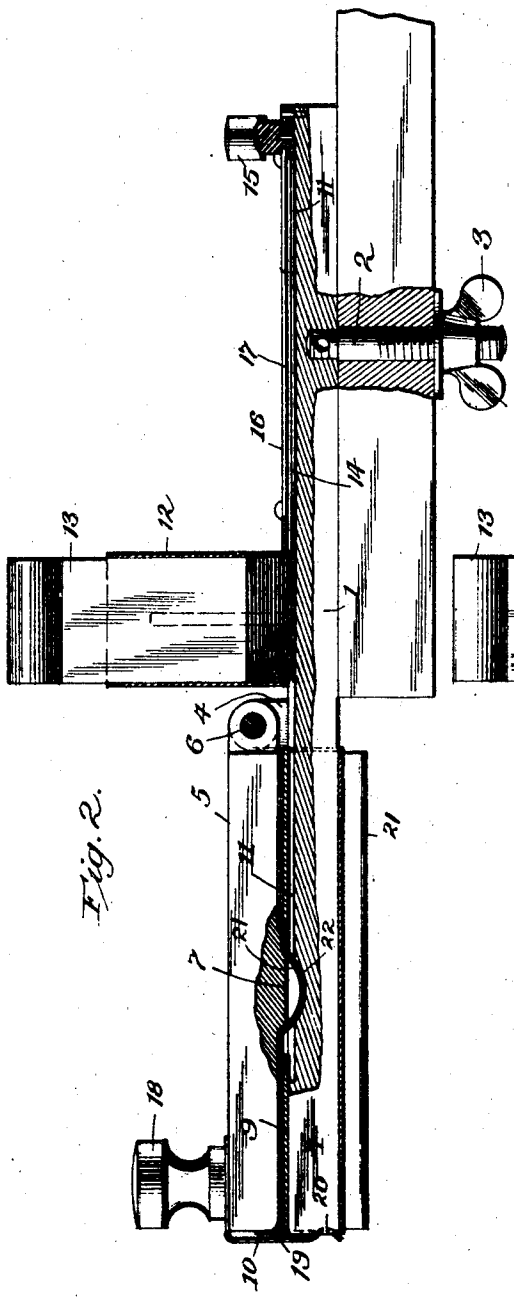


Fig. 2.

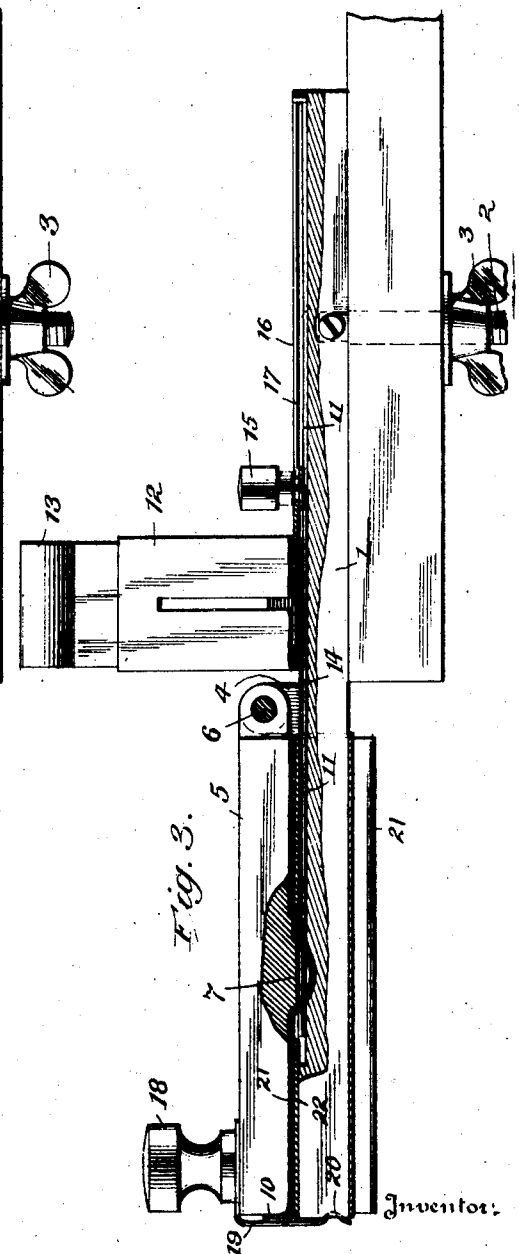


Fig. 3.

Inventor:

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UNITED STATES PATENT OFFICE.

ARTHUR W. McCURDY, OF VICTORIA, BRITISH COLUMBIA, CANADA.

SHEET-UNITING DEVICE.

1,350,371. Specification of Letters Patent. Patented Aug. 24, 1920.

Application filed June 12, 1917, Serial No. 174,303. Renewed December 9, 1919. Serial No. 343,644.

To all whom it may concern:

Be it known that I, ARTHUR W. McCURDY, a subject of the King of England, residing at Victoria, British Columbia, Dominion of Canada, have invented certain new and useful Improvements in Sheet-Uniting Devices, of which the following is a specification.

This invention pertains to a device for attaching two or more sheets of paper or similar thin, flat materials one to another by means of a headless pin, and is designed primarily for attaching the sensitized cellulose film of "daylight-loading" films to the light-excluding strip or wrapper. It is more particularly designed for use with a film of special construction set forth in a pending application Serial No. 164,693, filed in my name April 26, 1917. The purpose of the invention is to dispense with the gummed "stickers" now commonly employed, and to produce a fastening which shall be at once inexpensive, secure, and free from undesirable projection or protuberance which might interfere with the handling of the film in the camera or elsewhere.

A convenient and simple form of the device is illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of the structure;

Fig. 2 is a vertical longitudinal section through the magazine in which the fastening pins are stored, and through the channel in which the pin-driving plunger or follower and pins move in the operation of uniting two sheets;

Fig. 3 is a similar sectional view showing the plunger or follower advanced and the pin passed through the two sheets;

Fig. 4 is a view illustrating a modification of the table or bed of the device;

Fig. 5 is a broken perspective view showing the film and paper attached one to the other, the roll film here illustrated being that of my above-mentioned application; and

Fig. 6 is a similar perspective view showing the film and wrapper reversed, and partially broken away.

The apparatus here illustrated is but one of various forms in which the invention may be embodied, but is found to operate very satisfactorily and expeditiously, and to answer all practical requirements.

Referring again to the drawings, 1 indicates a flat bar advisably of metal, provided with a threaded stem 2 and a thumb-nut 3 by which the bar may be clamped or secured to a table or support in such manner as to be held against displacement, yet left free to be swung to one side when required. At a suitable point between its ends the bar 1 is provided with ears 4 between which is received one end of a clamping bar or lever 5, which is hinged or jointed to the ears 4 by a hinge-pin 6 passing through perforations in said ears and in the bar 5. At about its midlength bar 5 has on its lower face a swell or boss 7, preferably of arc shape, and the bar 1 is provided with a seat or recess 8 at a suitable point in its length to receive the swell or boss 7 when the clamping bar 5 is lowered from the vertical position in which it is shown in Fig. 1 to the horizontal position shown in Figs. 2 and 3.

Secured upon the bar 1 forward of the ears 4 is a table 9 having upstanding flanges 10 spaced apart a distance corresponding to the width of the film and wrapper or envelop to be handled. These flanges 10 may if desired be made adjustable in the manner illustrated in Fig. 4; that is to say, each may be made of L-shape in cross section, and secured to the table proper by screws or equivalent means. These screws may enter tapped holes positioned with reference to the different standard widths of film, or may be provided with nuts movable in slots in the table, as indicated. The tapped holes are preferable for the reason that the precise adjustment required will be determined by the properly positioned holes.

Bar 1 is provided with a longitudinal groove or channel 11, which extends from a point just forward of the seat or depression 8 of bar 1 to a point near the opposite or rear end of said bar. The cross section of this groove 11 is just sufficient to permit the free movement within it of the headless pins used as fasteners. These pins are stored in a magazine 12 just to the rear of the ears 4, and are of dimensions to permit a single stack of pins to be stored within it one above another, the lowermost pin lying in the groove 11, and the descent of the pins being insured by a gravitating follower 13. Also movable within the groove or channel 11 is a slide or plunger 14, the forward end of which, when the plunger is retracted, passes just to the rear of the magazine 12. The plunger is furnished at its rear end with a

knob 15, the shank or stem of which is grooved to receive the inner edges of a cover-plate 16 having a slot 17, and secured to the bar 1 by screws or other fastening. This construction precludes displacement of the slide or plunger 14, since its forward end is always beneath the cover-plate 16, and its rear end is held by the engagement of its knob or button 15 with the cover plate 16.

The clamping bar 5 is provided with a knob or handle 18 by which to move it, and with a spring catch 19, the free end of which enters a notch 20 in the forward end of bar 1 when said bar 5 is lowered to horizontal position. The swell or boss 7 of clamping bar 5 is grooved to form a continuation of the groove 11 of bar 1.

The device being constructed in the manner described, the light-excluding wrapper or envelop 21 with the cellulose film 22 upon it, is laid upon the table 9, and adjusted so that the end of the film slightly overlaps the bar 1. The clamping bar 5 is then lowered to horizontal position, and in assuming such position causes the swell or boss 7 to bear upon the film and the paper, and to bend or deflect both downward into the depression 8 and out of plane with the bed or table 9, the bend so made, or the lower portion of it, lying below the plane or level of the channel or groove 11. When the bar is thus lowered and locked by its spring catch 19, the knob 15 is grasped, the slide or plunger 14 is retracted from beneath the stack of pins in the magazine 12, permitting the lowermost pin to drop into the groove 11, and the plunger is then moved forward, carrying before it the lowermost pin, and forcing it through the paper and the film at both sides of the swell or boss 7. In other words, the pin passes from the under face of the paper and film to the upper side, and back from the upper to the under side, thus leaving both ends of the pin on the under side of the paper or film, as shown in Fig. 6. On the upper side only the mid-portion of the pin shows.

By using pins of small diameter and without heads, a very secure fastening is obtained without any material or objectionable projection, and the ends of the pin are in a position where they cannot cause injury or do any harm to the film in its further handling. In types of daylight-loading films where the light-excluding wrapper or envelop is folded back upon itself, as described in my above-mentioned application, the main body or strip of the paper will be passed beneath the table 9, as indicated in Fig. 2.

As the film may and commonly will be carried on reels or spools, the swiveling or mounting of the device in a manner to permit it to be swung out of line with the film is a matter of convenience, as otherwise difficulty might be experienced in removing the film and wrapper from the table 9.

Headless pins are employed in order that there may be no undesirable projection or protuberance that would tend to distort or injure film or wrapper when wound. If desired, the pins may be double pointed, thus making it possible to place the pins in the magazine without regard to which end is foremost with reference to direction of movement.

Various changes and modifications of the structure falling within the province of the mechanic or designer rather than that of the inventor, will readily suggest themselves, and are within the purview of the invention.

It will be observed upon referring to Figs. 1, 2 and 3, that the bed or table 9 forms a support for the paper independent of or additional to that afforded by the bar 1, and that the flanges 10 of the table are spaced equidistant from and on opposite sides of the depression 8, so that the bend in the paper, wrapper, or sheets to be united will be located at the mid-width thereof, the central portion of the bed being cut away to allow said sheets to be forced into the depression of the bar 1. It will also be seen that the groove 11 extends on opposite sides of the depression 8, thus giving a support for the pin at both sides of the depression, yet permitting the same to be lifted directly out of the groove when the sheets have been fastened together and are to be removed. By such support of the sheets and guidance and support of the pins, accurate and secure passage of the pins through the bend or fold in the paper is insured, and all liability of the sheets being shifted and causing the pin to bear other than a right-angle relation of the length of the paper, is avoided.

Having thus described my invention what I claim is:—

1. In a device for uniting sheets or films of material, the combination of a grooved bar having a seat or depression intersecting the groove; a sheet-supporting bed or table carried by said bar and having an opening to expose the depression in the bar; a second bar movable toward and from the first, provided with a swell or boss to fit the depression in the grooved bar, and slotted to form a continuation of the groove therein, a magazine freely communicating with said groove and adapted to contain a series of pins in immediate contact with one another; and a slide or plunger movable in the groove and serving to force a pin placed therein, lengthwise of the groove, across the depression, and through sheets clamped between said bars.

2. A sheet-uniting device comprising a support having a longitudinal channel to receive fastening pins, and a depression inter-

secting said channel; a co-acting bar or lever provided with a boss or swell to enter said depression, and slotted to form a continuation of the pin-receiving channel; a magazine freely communicating with said channel and adapted to contain a series of pins in immediate contact with one another; a bed or table overlying the supporting bar and cut away at its central portion to expose the depression in said bar; an adjustable flange or gage plate carried by said bed or table and serving to guide the sheets to be united; and a slide or plunger movable in the channel of the supporting bar to carry a pin forward therein, across the depression, and through the sheets lying upon the bed or table and in said depression.

3. In an apparatus for uniting sheets, the combination of a support having a longitudinal channel to receive fastening pins, and a depression intersecting said channel; a bed or table to receive and guide the sheets to be united; a bar or lever co-acting with and movable toward and from the channeled support and having a slotted swell or boss to enter the depression of the channeled support; a slide or plunger movable through the channel; and a holding device for securing the structure to a table or support, including an upright stem about which the structure may be swung into and out of line with the sheets handled by it.

4. The herein-described apparatus for uniting sheets, comprising a bar 1 having a channel 11 and depression 8; a bed or table carried by said bar and having an opening through which the depression 8 is exposed; a co-acting bar 5 provided with a slotted swell or boss 7 to enter the depression in the supporting bar; a magazine 12 freely communicating with the channel, to receive and hold in immediate contact fastening pins; and a slide or plunger 14 movable in the channel 11 and past the outlet of the magazine.

5. The herein-described apparatus for uniting sheets, comprising a bar 1 having a channel 11 and depression 8; a co-acting bar 5 provided with a slotted swell or boss 7 to enter said depression, and with a catch or fastening 19 for holding it in coöperative relation to the other bar 1; a magazine 12 to receive pins; a follower 13 for advancing the pins to the outlet of the magazine; and a slide or plunger 14 movable in the channel 11 and past the outlet of the magazine.

6. In apparatus for uniting sheets, the combination of a bar channeled to receive and guide fastening pins, and provided with a depression intersecting said channel; a co-acting bar or lever having a swell or boss to enter said depression and slotted to form a continuation of the pin-receiving channel; a slide or plunger movable in said channel and serving to move pins lengthwise of the same and across the depression in the channeled bar; and a sheet support having guiding flanges adapted to guide sheets of differing dimensions.

In testimony whereof I have signed my name to this specification.

ARTHUR W. McCURDY.