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Patented Sept. 11, 1900.

E. W. SILSBY.

DEVICE FOR UNITING CELLULOID TO PHOTOGRAPHIC PRINTS.

(Application filed Dec. 6, 1899.)

(No Model.)

Fig. 1.

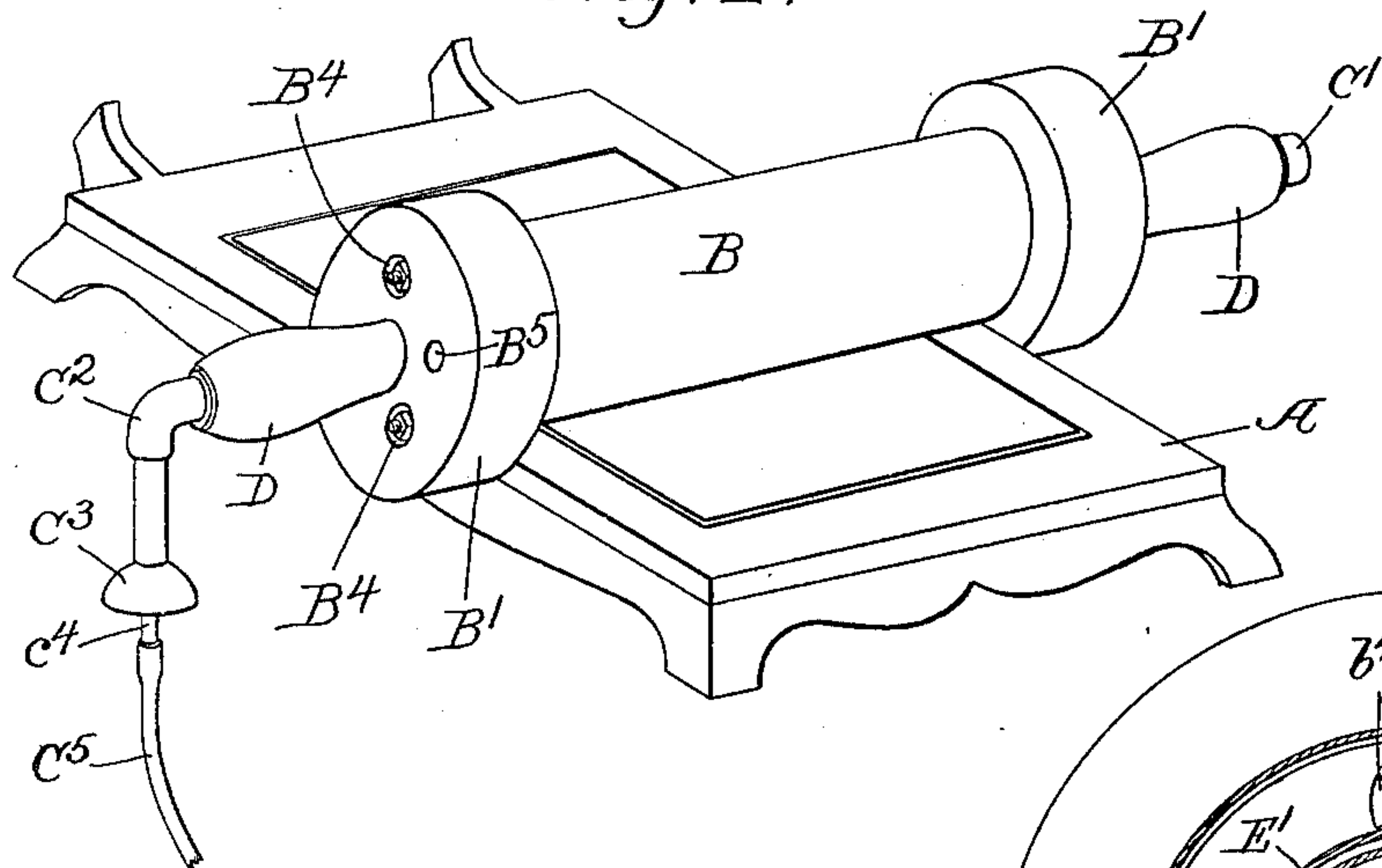


Fig. 3.

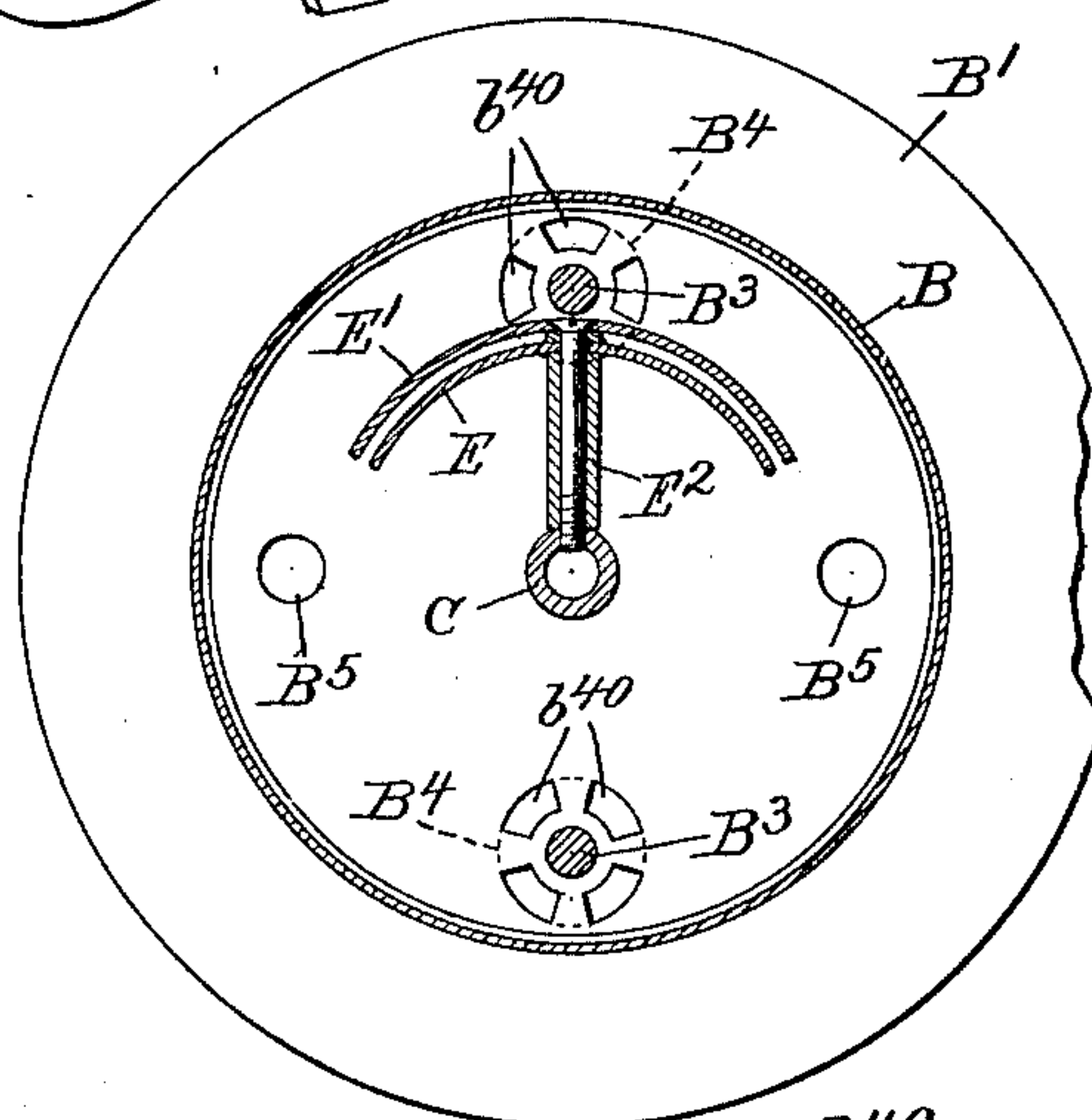
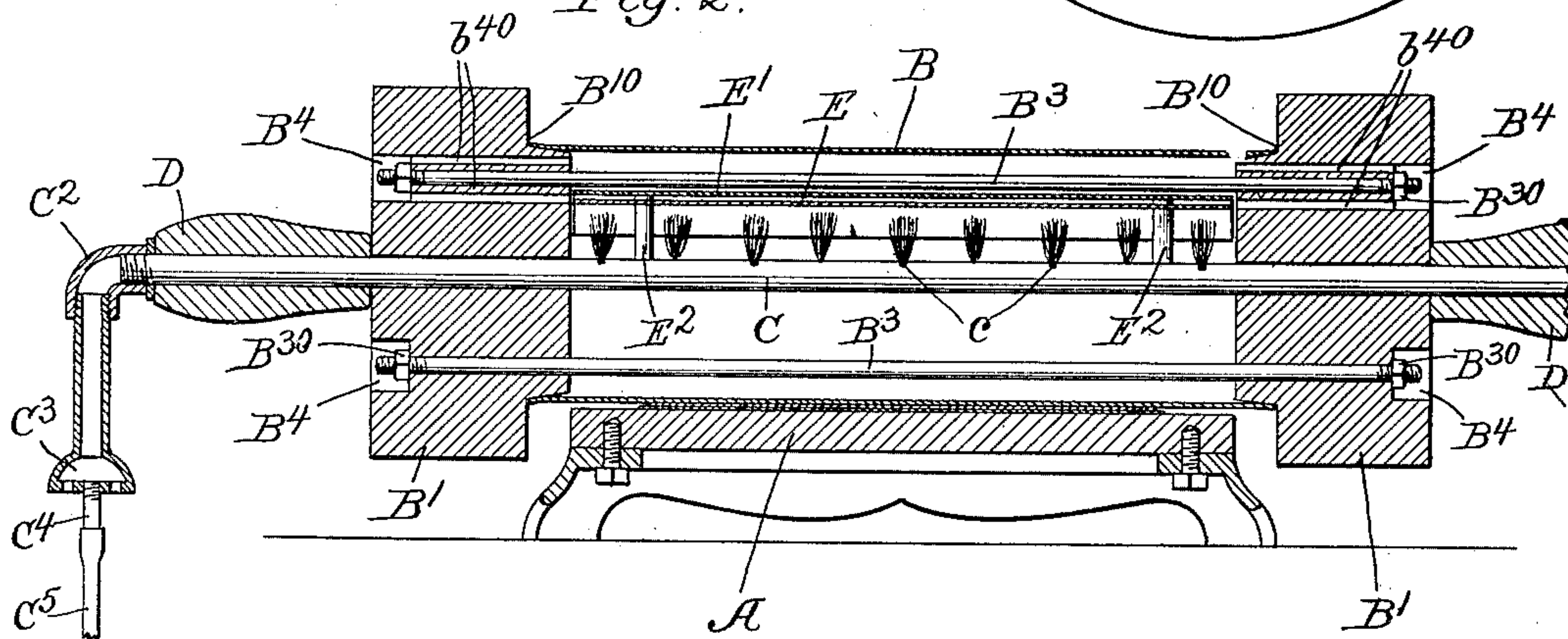


Fig. 2.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## DEVICE FOR UNITING CELLULOID TO PHOTOGRAPHIC PRINTS.

SPECIFICATION forming part of Letters Patent No. 657,749, dated September 11, 1900.

Application filed December 6, 1899. Serial No. 739,193. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE W. SILSBY, a citizen of the United States, residing at No. 403 Division street, Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Devices for Uniting Celluloid or Similar Facings to Photographic or other Prints, which are fully set forth in the following specification, reference being had to accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved apparatus for uniting to a transparent sheet of celluloid or like material a photographic print or other paper or film which is to be covered upon its printed or ornamented surface by the transparent sheet of celluloid, that purpose requiring that the two elements be permanently cemented or caused to adhere without either element becoming wrinkled or otherwise defaced. It is known that celluloid and like material may be caused to adhere to paper, such as a photographic print, by being slightly moistened with alcohol, which dissolves the celluloid to a slight extent, sufficient to cause it to adhere to the paper, the application of a moderate amount of heat to dissipate the alcohol causing the drying and hardening of the celluloid and rendering the adhesion permanent. The most satisfactory method of moistening the celluloid with sufficient uniformity is found to be to saturate the paper with alcohol and apply it in this moist condition to the face of the celluloid; but a difficulty is experienced in drying the elements to perfect the union and render it permanent without wrinkling or drawing the paper unequally. One method which has been attempted consists in passing the two elements when applied to each other, the paper having been moistened with alcohol, as described, between two rollers, one of which is heated sufficiently to dissipate the alcohol and dry the celluloid and paper. This method is found unsatisfactory because one element or the other is liable to slip in passing through the rollers, probably on account of the unequal grasp of the rollers upon the two surfaces of different character. At all events the result is almost invariably to wrinkle or tear one element or the other. The result can be accomplished by pressing the two ele-

ments when assembled ready for the drying process between two opposite dies, one or both of which is heated, such dies covering the entire surface of both elements. This method requires very great pressure because the entire surface is exposed to the pressure at one time. It is difficult to make it successful, furthermore, because of the necessity of perfectly-plane surfaces and perfect parallelism between the two surfaces of the two dies, and because, furthermore, even when parallel surfaces are obtained a slight inequality in the thickness of the paper or celluloid at different points will prevent adhesion at the thinner places, or, if the pressure is sufficient, will produce perfect adhesion at such points only by stretching or spreading the thicker parts, with the result, usually, of marring the ornamentation. My improved apparatus overcomes all these difficulties and affords means for easily and reliably effecting the purpose without marring either of the elements united. My method consists in the employment of a flat tablet or platen to support the two elements, and a roller which may be rolled by hand with such pressure as can easily be applied by the operator upon the handles with which the roller is provided at the opposite ends, such roller being heated by gas conducted into it through the gas-pipe axle upon which the handles are mounted and to which a flexible pipe is connected at one end for affording gas-supply.

Specifically, my invention consists in a particular form of roller comprising a shell of thin steel tubing and cast-iron heads in which the axle is journaled. The thin tubing I find it necessary to employ for the operating-surface of the roller because, although a hollow cast-iron roller may be made, the liability to slight defects in the casting and the amount of heat necessary to heat through a shell of the thickness which is necessary when it is made of cast-iron makes that mode of construction unsatisfactory and hazardous. The employment of the thin shell of tubing, however, creates the necessity for a shield between the gas-jets and the tubing, since otherwise the roller at rest would be liable to be heated to a dangerous temperature at a line immediately above the jets, while it might not be hot enough at the opposite side, and in this



specific form of my invention, therefore, a shield to overcome this difficulty is an important feature.

In the drawings, Figure 1 is a perspective view of my apparatus in a position of use, showing two sheets assembled on the platen under the roller and ready to be united by the device. Fig. 2 is a section axial with respect to the roller through the same and the tablet and the sheets thereon. Fig. 3 is a transverse section of the roller.

A is a firm rigid base or platen of material which has been machined to give it a true level upper surface. The roller which operates upon this platen comprises a thin metal shell B, preferably made of steel tubing, and heavy or weighted cast-iron caps or heads B' B', secured to and retained in conjunction with the shell B in any similar manner. As illustrated, I make the heads or caps B' with a rabbet B<sup>10</sup> about the periphery at the inner face, the longitudinal face of the rabbet being sloping, so as to make a tapering seat onto which the steel-tubing shell B is drawn and with which, therefore, it makes a tight junction by means of the longitudinal binding rods or bolts B<sup>3</sup> B<sup>3</sup>, which extend longitudinally through the roller through the shell, penetrating both the heads B' B' and provided exteriorly with nuts B<sup>30</sup> B<sup>30</sup>, which are lodged in recesses B<sup>4</sup> B<sup>4</sup>, formed in the outer face of each head B'.

C is the axle, which consists of a piece of gas-pipe extending through the heads B' B' at the center of the latter, which are thus journaled on the axle.

D D are handles on the axle outside the heads B' B', respectively. They are retained by a cap C' at one end and a suitable fitting, as an elbow C<sup>2</sup>, at the other end. To the elbow C<sup>2</sup> there is connected a short pipe terminating in the mixer C<sup>3</sup>, into which there is connected a nipple c<sup>4</sup>, to which a flexible pipe C<sup>4</sup> is attached, leading from any source of gas-supply.

Within the shell B the axle C has gas-orifices c c, &c., discharging upward, and on the axle there is mounted a shield or spreader for the gas-flame, which prevents the overheating of the shell immediately above the flame and causes a substantially-equal distribution of the heat throughout the entire circumference of the shell even when the roller is at rest, the distribution being rendered even more perfect by the rotation of the roller in use. This shield or spreader is a hollow or double-walled segment of a cylinder occupying about one hundred and twenty degrees of the shell, within the latter and supported so as to be retained at the upper part—that is, above the axle C—so as to overhang the flame-jets. I have made it and it is illustrated as consisting of two curved plates E E', one within or under the other, supported by arms E<sup>2</sup> E<sup>2</sup>, extending up from the pipe C. The space between the two pipes is sufficient,

even though it be very slight, to prevent the heating of the outer or upper plate to any extent sufficient to overheat the portion of the shell opposite or outside of it, and the shield therefore operates as practically a perfect distributor of the hot products of combustion from the gas-jets, causing them to be thrown around the entire circumference of the shell, heating it at all parts, a sufficient portion returning and passing outside the outer plate E', between the same and the portion of the shell overhanging it, so that that portion is heated, as well as the remainder. In practice the only material difference of temperature observable at different parts of the circumference is that the shell is not quite so highly heated directly above or opposite the deflector as it is at the remainder of the circumferential extent; but in use, since the lower and not the upper side of the roller operates upon the parts to be united lying on the platen, this difference is unimportant and is practically overcome by the time the roller has made the half-rotation necessary to bring the upper part to the lower side.

For the purpose of permitting the escape of the products of combustion, as well as furnishing air to support the combustion in addition to that which enters through the mixer, the heads B' B' have apertures at four points, so that there shall always be at least one aperture at or near the lower side and another at or near the upper side to insure proper circulation. Two of these points of ventilation are situated about the apertures through which the binding-rods penetrate the plates, the bottom of the recesses B<sup>4</sup> having, in addition to the central aperture through which the binding-rod extends, sectoral apertures b<sup>40</sup> b<sup>40</sup>, &c., for ventilation. The other two of the four ventilating-apertures mentioned are located at B<sup>5</sup> B<sup>5</sup>, ninety degrees around from the recesses B<sup>4</sup> B<sup>4</sup>.

The heavy or weighted caps B' B' are designed to be adequate to afford substantially all the pressure necessary to perform the work for which the implement is intended. The handles D D, however, afford the operator an opportunity to add to that pressure any amount requisite; but the uniformity of the pressure afforded by the weighted heads is of advantage in using the device, and it is preferable for most purposes to use the handles merely for the purpose of guiding or communicating rolling motion to the roller and not for pressure.

I claim—

1. A roller for the purpose indicated, comprising a metal shell or hollow cylinder, and ventilated metal heads or caps closing the ends of the cylinder; a tubular axle, connected at one end with a source of gas, and having gas-discharge orifices within the cylinder; combined with a shield or deflector mounted within the shell and supported so as to be interposed between the same and the



gas-orifices, to shield the shell from the direct action of the same and deflect the latter.

2. An implement for uniting celluloid or like facing to photographic or other prints or films, comprising a plain metal base or platen and a metal shell or hollow cylinder constructed to operate as a roller; ventilated heads or caps closing its ends; a tubular axle connected at one end with a source of gas, and having gas-orifices within the cylinder, and handles at the opposite ends, outside the cylinder; and a shield or deflector mounted on the axle within the shell, interposed between the latter and the gas-orifices to deflect the flame and shield the shell from the direct action thereof.

3. A roller for the purpose indicated comprising a thin metal shell or hollow cylinder, and ventilated metal heads or caps closing the ends of the cylinder; a tubular axle connected at one end with a source of gas and having gas-orifices within the cylinder, and a shield or deflector, comprising an upper and lower wall, and intervening air-space, mounted within the shell and supported so as to be interposed between the same and the gas-orifices to shield the shell from the direct action of the flame and deflect the latter.

4. An implement for the purpose indicated comprising a plain metal base or platen and a roller, comprising a thin metal shell or hollow cylinder, and heavy or weighted metal heads or caps closing the ends of the cylinder, and provided with ventilating-apertures, and a tubular axle having a flexible connection at one end with a source of gas and having gas-orifices within the cylinder, and a shield or deflector mounted within the shell and held interposed between the same and the gas-orifices, said shield comprising an up-

per and a lower wall or plate, with an intervening air-space.

5. A roller for the purpose indicated comprising a thin metal shell or hollow cylinder and ventilated metal heads or caps closing the ends of the cylinder; a tubular axle having a flexible connection at one end with a source of gas and having gas-orifices within the cylinder and provided with suitable handles at opposite ends of the cylinder by which the roller may be operated while the axle is held non-rotating; and a shield or deflector mounted within the shell and held interposed between the same and the gas-orifices to shield the shell from the direct action of the flame and to deflect the latter.

6. A roller for the purpose indicated, comprising a thin metal shell or hollow cylinder, and heavy or weighted and ventilated metal heads or caps closing the ends of the cylinder, adapted to afford by their weight the necessary pressure; a tubular axle having a flexible connection at one end with a source of gas, and having gas-orifices within the cylinder, and provided with suitable handles at opposite ends of the cylinder, whereby the cylinder may be rotated while the axle is held non-rotating, and a shield or deflector mounted within the shell and interposed between the same and the gas-orifices, such shield or deflector comprising an upper and a lower plate, with an intervening air-space.

In testimony whereof I have hereunto set my hand, at Chicago, Illinois, this 1st day of December, 1899.

E. W. SILSBY.

Witnesses:

CHAS. S. BURTON,  
EDWARD T. WRAY.