

I. H. STODDARD.
PHOTOGRAPHIC WEB HOLDER.

No. 370,216.

Patented Sept. 20, 1887.

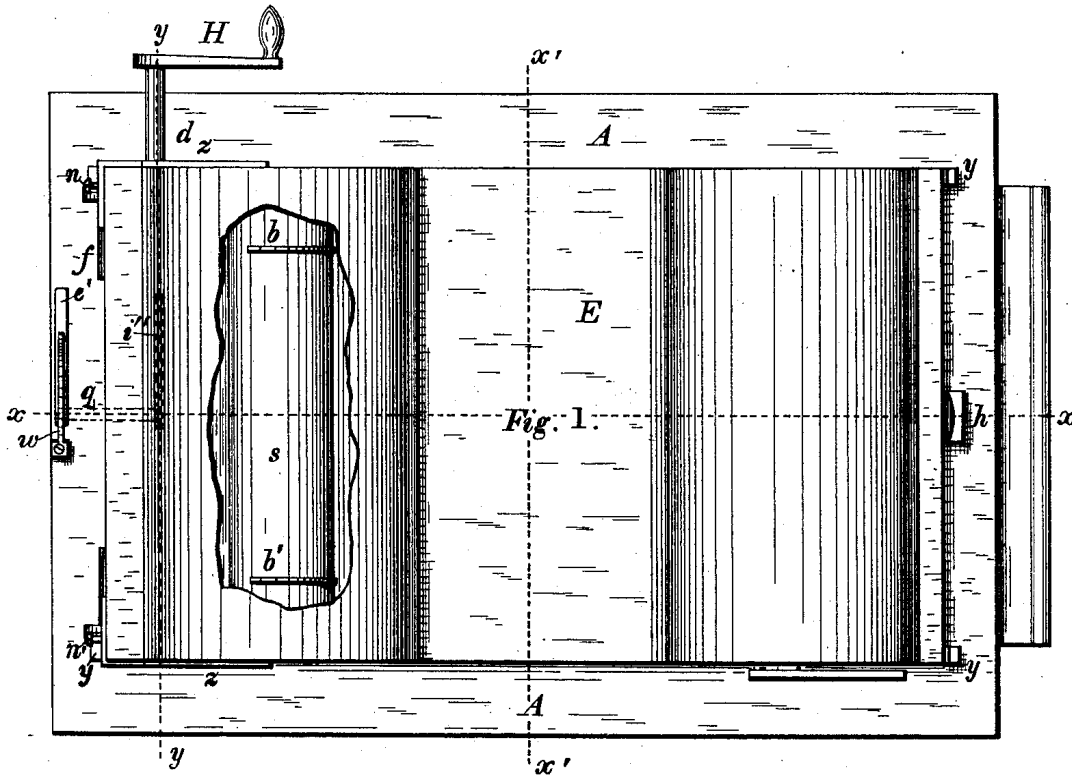


Fig. 1.

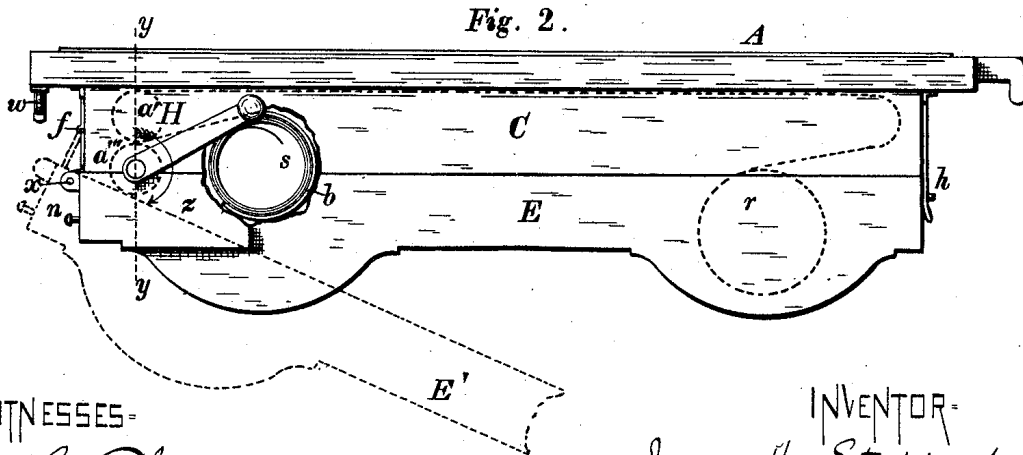


Fig. 2.

WITNESSES-

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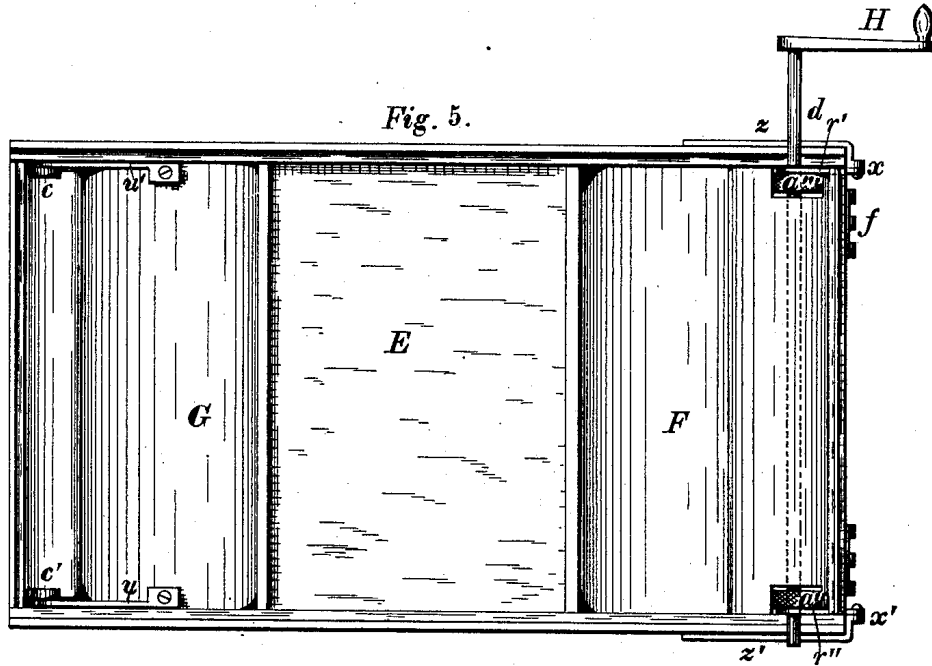
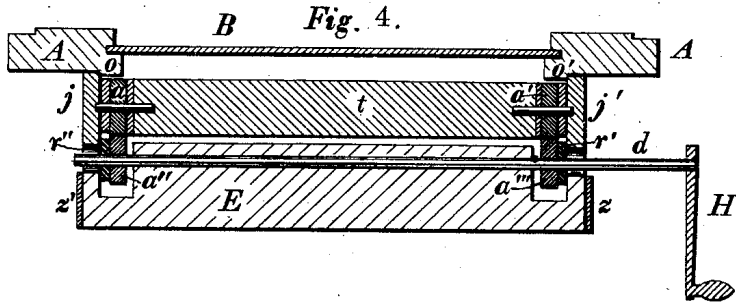
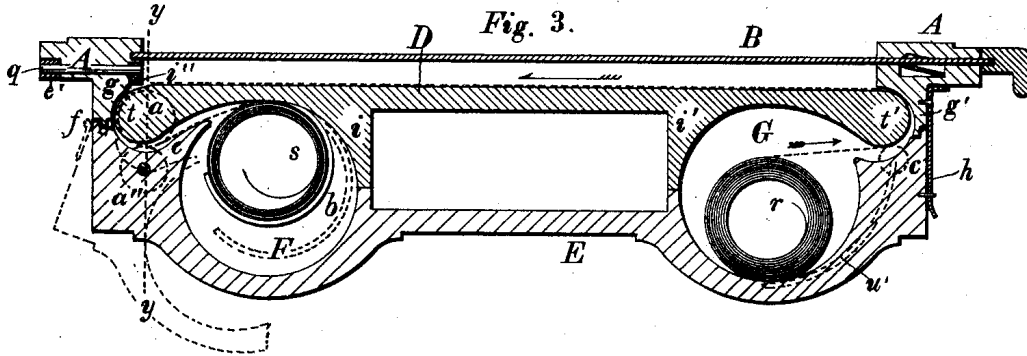
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Fig. 6.

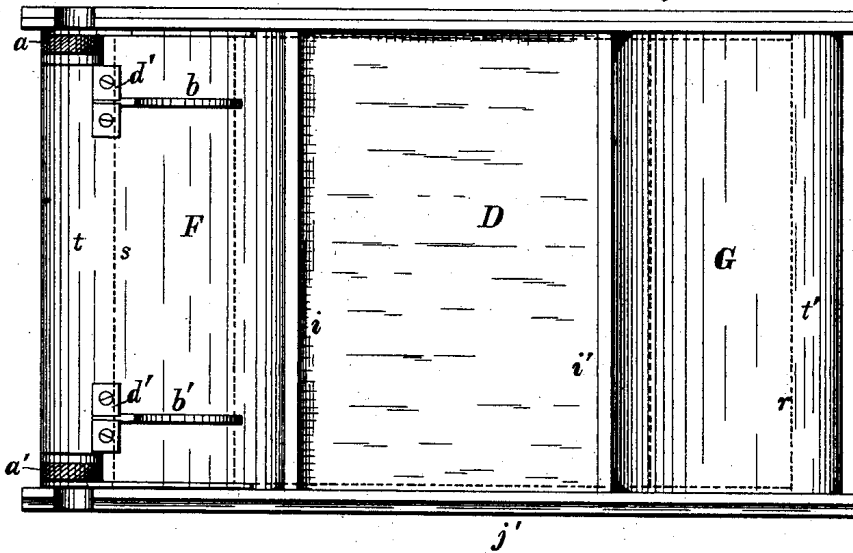


Fig. 9.

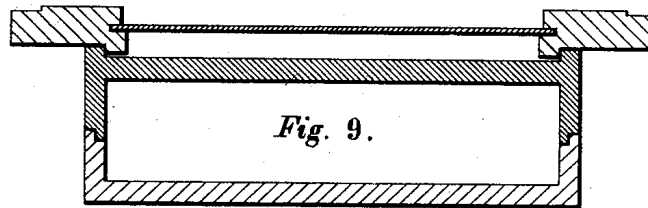


Fig. 7.

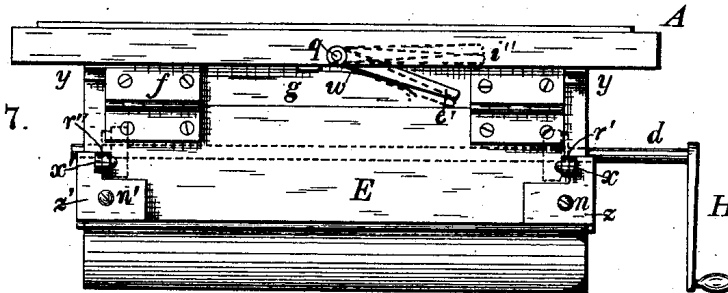
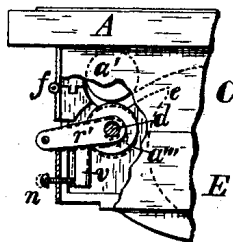


Fig. 8.



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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC WEB-HOLDER.

SPECIFICATION forming part of Letters Patent No. 370,216, dated September 20, 1887.

Application filed April 26, 1886. Serial No. 200,131. (No model.)

To all whom it may concern:

Be it known that I, ISAAC H. STODDARD, a citizen of the United States, residing at New Haven, in the State of Connecticut, have invented an Improved Photographic Web-Holder, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improved photographic web-holder or apparatus for exposing webs or strips of sensitized paper or film for the production of photographic negatives.

My improved web-holder is fully described and illustrated in the following specification, and the novel features thereof specified in the claims annexed to the said specification.

In the accompanying drawings, representing my improved photographic web-holder, Figure 1 is a rear elevation. Fig. 2 is a view of my improved web-holder as seen from above. Fig. 3 is a central longitudinal section on the line *x x*, Fig. 1. Fig. 4 is a transverse section on the line *y y*, Figs. 1, 2, and 3. Fig. 5 represents the back or cover as seen from the inside. Fig. 6 is a rear view of the paper-support. Fig. 7 is an end view. Fig. 8 is a view showing the means for adjusting the pressure of the feeding-rollers on the edges of the sensitized web. Fig. 9 is a transverse section on the line *x' x'*, Fig. 1.

In my improved apparatus for exposing sensitized paper or film the web of paper or film is drawn along in front of the paper-support by friction-rollers applied to its edges, the holder being provided with two receptacles, one of which holds the unexposed portion of the web, while the other receives the exposed portion delivered to it by the rollers, being provided with coiled springs or guides, within which the web is caused to automatically coil itself up into a roll.

The principle of operation as above described may be applied in various different ways to holders of different construction; but in the following specification and accompanying drawings I have described and illustrated the construction of an apparatus which has proved in practice a satisfactory means of carrying my invention into effect.

My improved web-holder consists, essentially, of a front, A, provided with the usual exposing-slide, B, a case or frame-work, C, which sustains the paper-support D, and a removable or hinged back, E, the recesses or receptacle F G for the web being formed either wholly or partially in either the casing C or the back E.

The mode of operation will perhaps be best understood from an inspection of the longitudinal section, Fig. 3, in which G is the recess or receptacle which holds the unexposed film wound in a loose roll, *r*, and F the receptacle for the exposed film *s*, which is delivered into it by the rollers indicated by the dotted circles *a a'*. The web of paper, as it is delivered into the receptacle F, is caused to coil itself up into a roll by means of the elastic guide or springs *b b'*, attached to the interior of the receptacle. As indicated in Fig. 3, the springs *b b'* are attached to the interior of the receptacle in such position as to cause the web, as it is fed in by the rollers *a a' a'' a'''*, to coil or wind itself into a roll within the springs, which sustain it in place.

In the drawings I have represented the coiling mechanism as consisting of two curved springs, *b b'*; but it is obvious that a single spring might be employed, especially if made wide and for use on narrow webs. As the coil of web *s* accumulates within the guide or springs their elasticity permits them to yield and to receive and inclose an amount of web equal to the capacity of the receptacle G, as indicated by the dotted lines in the receptacle F. The web is drawn along, as indicated by the arrows in Fig. 3, in front of the web-support D between each exposure. In order to maintain the web in a state of tension, I apply a frictional resistance to the movement of the web, either on the roll *r* itself or at the right-hand end in Fig. 3, just before the web passes in front of the support. This resistance is conveniently formed by means of the friction-rollers *c c'*, Figs. 3 and 5, arranged to bear on the edges of the web with a yielding pressure, so as to cause a slight resistance to the movement of the web sufficient to compel the feeding-rollers *a a' a'' a'''* to draw the web down flat

against the surface of the support. The rollers $c c'$ are supported by suitable springs—such, for instance, as those shown at $u u'$, Figs. 3 and 5.

5 As represented in the drawings, the ends of the support D are enlarged and rounded at $t t'$, so as to avoid unnecessary resistance to the movement of the paper. The yielding rollers $c c'$ hold the web against the end of the web-support with a gentle pressure sufficient to keep the web in contact with the front side of the support.

15 The feeding-rollers $a a'$ on the plain or unsensitized side of the web are arranged to revolve on suitable studs or pins inserted in the support, as shown in Fig. 4. The rollers $a'' a'''$ are supported in the back E on a shaft, d , which extends outward, and is provided with a handle or thumb-nut, H. When the removable or hinged back E is closed, as indicated by the full lines in Fig. 2, the rollers $a'' a'''$ on the shaft d come in contact with the web near its edges and press it against the rollers $a a'$ with sufficient force to cause the web to be fed 25 along by the revolution of the rollers. On turning the handle or crank H in the direction indicated by the arrow in Fig. 2, the web is drawn along the support D, so as to shift the last exposure into the receptacle F and to 30 cause an unexposed portion of web to take its place in front of the support. It will be obvious that the rollers $a a'$ in the support may be omitted, the web sliding along the surface of the support when the rollers $a'' a'''$ are revolved; but I prefer to employ them as secur- 35 ing a smoother and easier movement of the web. It will also be observed that the driving-rollers $a'' a'''$ may be arranged to act on the back or unsensitized side of the film. The rollers, also, may have smooth edges; but I prefer to provide them with slight corrugations, as indicated in the drawings. The back E of the holder is provided with an inwardly-projecting lip or curved plate, e , Fig. 3, which serves 40 to guide the web into the springs $b b'$.

45 In the drawings I have represented the back as hinged at f to the rib g on the rear side of the front, so that it may swing open, as at E' , Fig. 2, and as provided with a catch, h , by which it is held in position when closed; but it is obvious that any other means of detachably connecting the back with the holder may be employed. The case C is provided with transverse partitions $i i'$, which form parts of the inner walls of the receptacles F and G, and 50 at each side it is provided with the plates or flanges $j j'$, Figs. 4 and 6, which engage with a rib or groove on the rear side of the front in such a way as to exclude the light. In the construction shown in the drawings I have placed on the rear side of the front the two parallel ribs $o o'$, Fig. 4, with the outer edges of which the plates $j j'$ engage for the purpose of rendering the holder light-tight. The ribs $o o'$ 65 also serve as guards to hold the edges of the

web in contact with the support and to prevent any tendency in the edges to curl away from the support. The front is also provided with the projecting ribs or ledges $g g'$, which are fitted to the ends of the back by a suitable 70 light-tight or grooved joint, as indicated in the sectional view, Fig. 3. In a similar manner the joints between the sides $j j'$ of the casing C and the front side of the back E are rabbeted or grooved to render the structure 75 light-tight.

In the drawings I have represented the outer part of the receptacles F and G as formed by curved portions of the back E; but it is obvious that any other preferred mode of forming 80 the receptacles may be adopted. The casing C and web-support may be entirely removed from the holder on opening or detaching the back, suitable angle-pieces, yy , being attached to the front to prevent the case from shifting, if desirable. The springs $b b'$ are attached to the interior of the receptacle F by the clips 85 d' , Fig. 6.

The handle H serves to indicate by the number of turns given to it the amount or length 90 of web necessary to be fed forward for a fresh exposure. The rollers $a'' a'''$ are made of such a diameter that an even number of turns will feed the web the requisite distance. Thus, for instance, in case an eight-inch holder is used, 95 the rollers may be given such a size that four revolutions will feed the web the required eight inches. The rollers may, however, bear any other relation to the length of web required for a single exposure, being in some 100 cases made of such a size that a single revolution will feed sufficient web.

Provision is made for adjusting the amount of pressure between the feed-rollers and the web by means of the adjusting screws $n n'$, 105 which are arranged to bear on the projections v on the hinged arms $r' r''$, Figs. 5 and 8, provided with journals, within which the shaft d revolves. When the screws $n n'$ are turned inward, their points, bearing on the projections 110 v , cause the arms $r' r''$ to swing so as to decrease the distance between the rollers. By this construction I am enabled to provide for wear in the journals or to adapt the apparatus to the use of sensitized webs of varying thick- 115 nesses. The arms $r' r''$ are pivoted at $x x'$ to the plates $z z'$, attached to the back, and which, for the purpose of securing additional strength, may extend around the corners, as indicated in the drawings. 120

In the practical operation of my improved web-holder a roll of sensitized web of the proper width is placed within the receptacle G, its outer or free end being drawn along in front of the web support D, as indicated by the dotted lines in Fig. 3, and introduced within 125 the coiled elastic guides $b b'$. It is needless to remark that this operation must be performed in a suitable non-actinic light. The back being then applied to the holder, the rollers a'' 130

a''' will be brought in contact with the edges of the web, so that the web may be drawn along in front of the support, while all light is excluded. The operator, having made an exposure, will, by giving the crank H the requisite number of turns, cause the exposed portion of the web to coil itself within the spring-guides $b b'$ in the receptacle F, and a sufficient quantity of unexposed film to extend itself along the front of the web-support D. This operation is repeated as often as a fresh exposure is desired to be made until the amount of unexposed film in the receptacle G has been exhausted. The elastic guides $b b'$ expand as the exposed film is coiled within them, as indicated by the dotted lines in the receptacle F, Fig. 3.

A web marking or perforating device may be attached to my web-holder in any suitable manner. I have indicated the manner of applying such an attachment in the drawings. It consists, essentially, of a movable arm, i'' , inside the holder, provided at its free end with a point or marker adapted to indent or perforate the web, and connected by a spindle, g , with an arm, e' , located on the outside of the holder, by which the marker is caused to act on the web at the proper time to indicate the dividing-lines between the different exposures. A spring, w , serves to keep the marking-point out of contact with the web when not in use. The marking device may be applied to my improved web-holder in any preferred location thereon.

I claim—

1. In combination with a photographic web-holder, friction-rollers adapted to feed the web by contact with its edges, substantially as and for the purposes set forth.

2. In combination with a photographic web-holder, friction-rollers adapted to feed the web by contact with its edges, and a suitable brake or frictional device applied to the web, substantially as and for the purposes set forth.

3. In combination with a photographic web-holder, the feeding-rollers $a'' a'''$ and web support D, substantially as described.

4. In a photographic web-holder provided with the receptacles F and G, the web-support D and friction-rollers $a'' a'''$, substantially as described.

5. The combination, in a web-holder, of the web-feeding rollers $a' a'' a'''$ and web-support D, substantially as described.

6. The combination, with a photographic web-holder, of the feeding-rollers $a'' a'''$, shaft d , and crank H, substantially as described.

7. The combination, with a photographic web-holder provided with the receptacles F and G, of the web-support D, friction-rollers for feeding the web, and resistance-rollers $c c'$, substantially as described.

8. In a photographic web-holder, the web-feeding rollers applied to the edges of the web, and a suitable guide or guides operating to

form the exposed web into a roll, substantially as described.

9. In a photographic web-holder, a web receiving receptacle provided with a curved guide adapted to form the exposed web into a roll, substantially as described.

10. The combination, with a photographic web-holder provided with the receptacles F and G for the exposed and unexposed web, of the web-support D, suitable friction-rollers for feeding the web, and means, substantially as described, for effecting the coiling of the exposed web within one of the receptacles.

11. The combination, in a photographic web-holder, of the receptacles F and G for exposed and unexposed web, web-support D, friction-rollers for feeding the web, and frictional device to maintain the web in a state of tension, and suitable means for coiling the exposed web within one of the receptacles, substantially as described.

12. The combination, with the receptacles F and G for exposed and unexposed film, of the web-support D, having rounded ends $t t'$, and the curved or tortuous passages leading to said film-receptacles, substantially as described.

13. The combination, in a photographic web-holder, of the receptacles F and G for exposed and unexposed web, web-support D, and projecting lip e , substantially as described.

14. The combination, in a photographic web-holder, of the receptacles F and G for exposed and unexposed web, web-support D, and one or more coiled springs, b , adapted to act as guides to effect the coiling of the exposed web within one of the receptacles.

15. The combination of the receptacles F and G, web-support D, lip e , and one or more curved elastic guides, b , substantially as described.

16. In a photographic web-holder, friction-rollers applied to the edges of the web to feed the same, and suitable means for adjusting the pressure of the rollers on the web, substantially as described.

17. The combination, with a photographic web-holder, of the friction-rollers $a' a'' a'''$, shaft d , and crank H, arranged to operate as an indicator of the length of the web for one exposure, substantially as described.

18. The combination, with a photographic web-holder, of the friction-rollers $a'' a'''$, arms $r' r''$, and adjusting-screws $n n'$, substantially as described.

19. The combination, with the front A, provided with the exposing-shutter B, of the casing C, carrying web-support D, back E, receptacles F and G, and friction-rollers applied to the edge of the web and adapted to be revolved to shift the web, substantially as described.

20. In a photographic web-holder, in combination with suitable mechanism for feeding

the sensitized web, a device for coiling the exposed web as it comes from the feeding mechanism, and guards for holding the edges of the sensitized web against the web-support, substantially as described.

5 21. In a photographic web-holder, the combination of the guards for holding the edges of the sensitized web against the web-support,

and a suitable friction device for feeding the web, and a brake or frictional-resistance device operating to maintain the web in a state of tension, substantially as described. 10

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Witnesses:

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