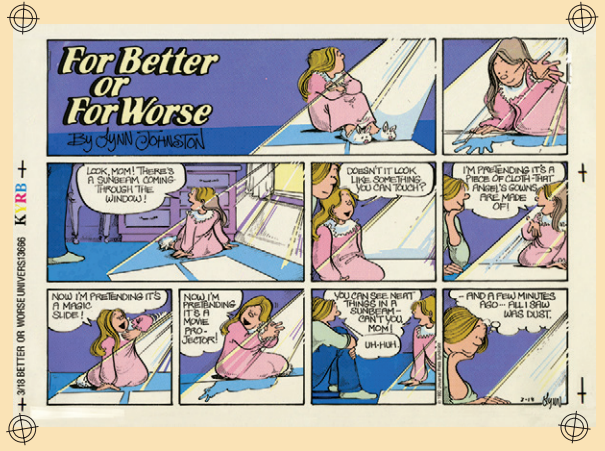


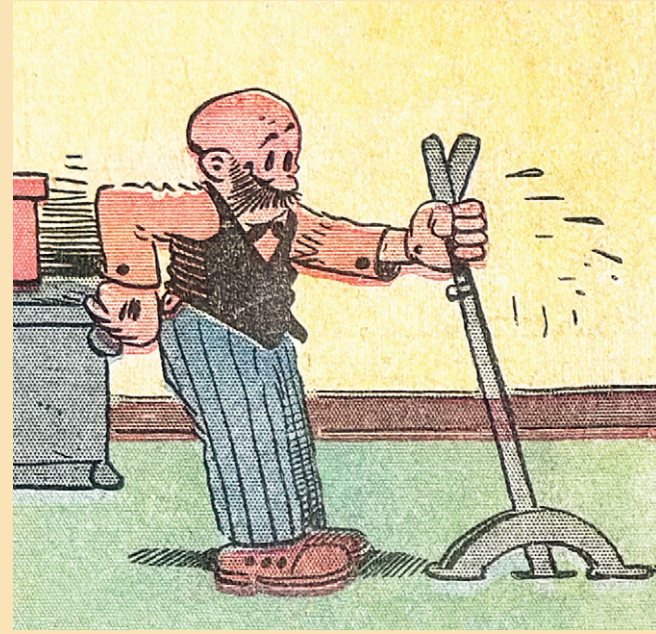


# HOW COMICS WERE MADE

A Visual History from the Drawing Board to the Printed Page  
BY GLENN FLEISHMAN



PREVIEW



# CHAPTER PREVIEW

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# HOW COMICS WERE MADE

By Glenn Fleishman

Design by Mark Kaufman

This chapter, “Comics Syndication in Metal,” offers a preview of what *How Comics Will Made* will look like if the Kickstarter campaign reaches its goal ([visit campaign](#)). The book will contain narrative chapters advancing over time, explaining each era of newspaper comics production, interspersed with visual essays and timelines like this chapter, using historic photos, cartoons, illustrations, and stills from films alongside pictures of modern artifacts.

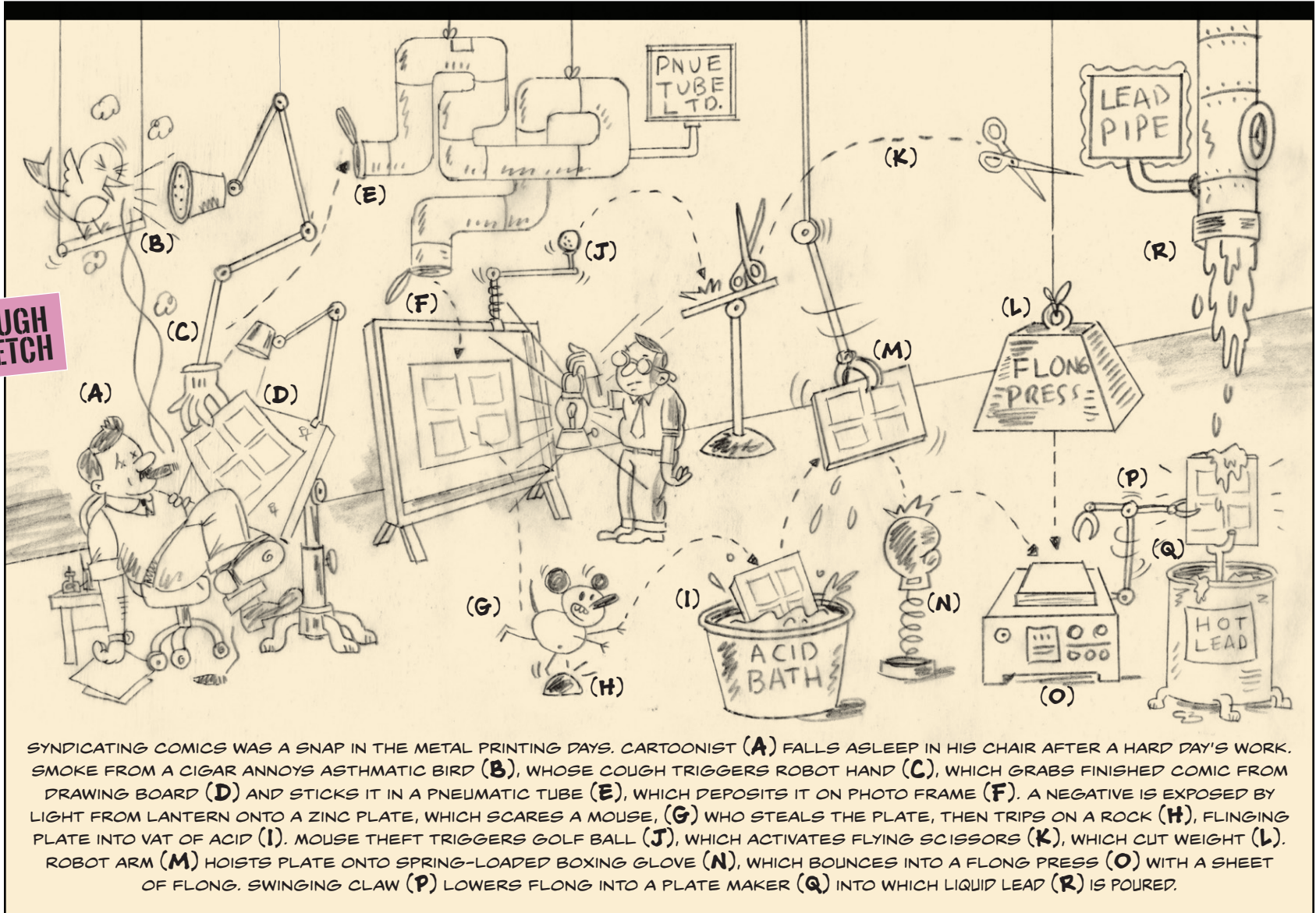


APERIODICAL

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Contact Glenn Fleishman  
at [glenn@glennf.com](mailto:glenn@glennf.com)

# COMICS SYNDICATION IN METAL

ROUGH SKETCH

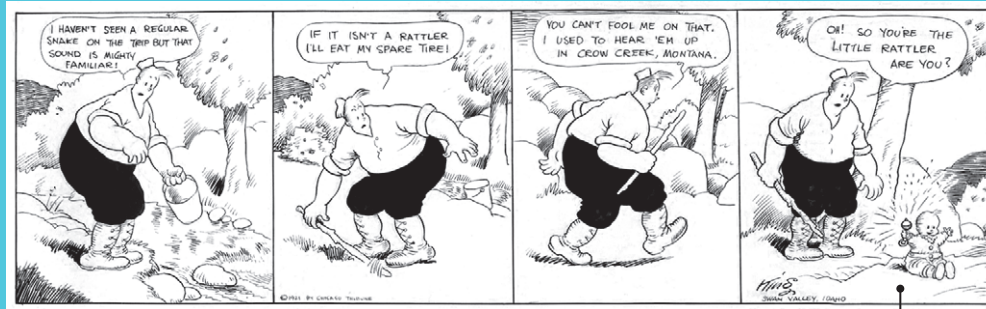


SYNDICATING COMICS WAS A SNAP IN THE METAL PRINTING DAYS. CARTOONIST (A) FALLS ASLEEP IN HIS CHAIR AFTER A HARD DAY'S WORK. SMOKE FROM A CIGAR ANNOYS ASTHMATIC BIRD (B), WHOSE COUGH TRIGGERS ROBOT HAND (C), WHICH GRABS FINISHED COMIC FROM DRAWING BOARD (D) AND STICKS IT IN A PNEUMATIC TUBE (E), WHICH DEPOSITS IT ON PHOTO FRAME (F). A NEGATIVE IS EXPOSED BY LIGHT FROM LANTERN ONTO A ZINC PLATE, WHICH SCARES A MOUSE, (G) WHO STEALS THE PLATE, THEN TRIPS ON A ROCK (H), FLINGING PLATE INTO VAT OF ACID (I). MOUSE THEFT TRIGGERS GOLF BALL (J), WHICH ACTIVATES FLYING SCISSORS (K), WHICH CUT WEIGHT (L). ROBOT ARM (M) HOISTS PLATE ONTO SPRING-LOADED BOXING GLOVE (N), WHICH BOUNCES INTO A FLONG PRESS (O) WITH A SHEET OF FLONG. SWINGING CLAW (P) LOWERS FLONG INTO A PLATE MAKER (Q) INTO WHICH LIQUID LEAD (R) IS POURED.

# COMICS SYNDICATION IN METAL

From roughly the 1910s to the 1980s, comic syndication required a Rube Goldberg-like series of steps from cartoonist to newsprint.

Follow the steps over the next pages (shown here in overview) through generations of transformation across molds and plates until the comic reaches readers' hands.



Original art



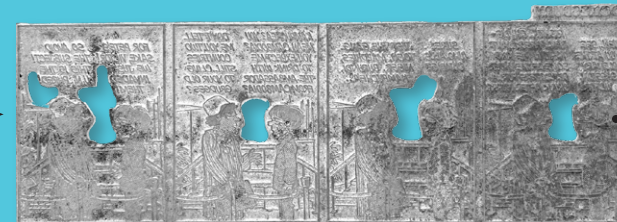
Negative



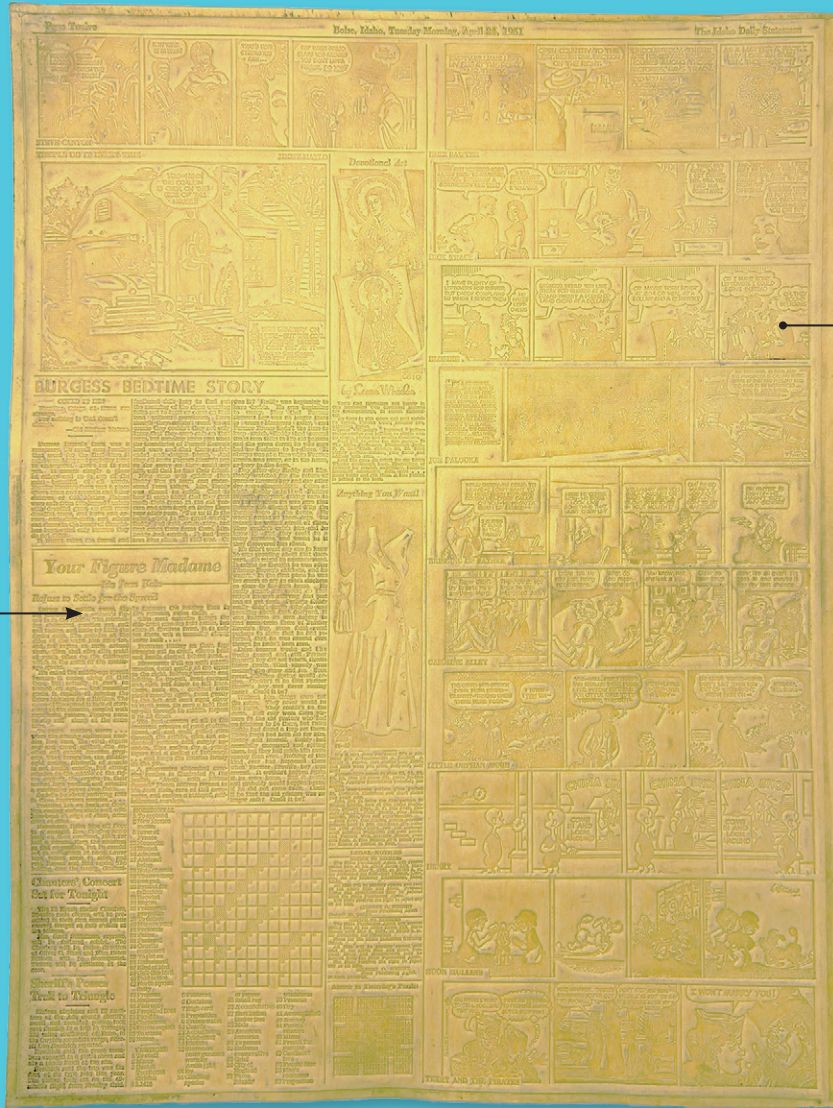
Zinc



Flong



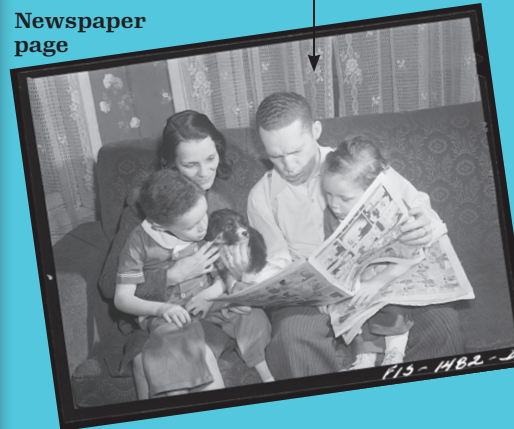
Stereo



Full-page flong



Full-page curved stereo



Newspaper page

Jazz drummer and bandleader Theodore Dudley "Red" Saunders and his wife Ella read the comics pages with their children (and dog).  
Jack Delano, 1942

Here are a few useful terms to know for the following pages:

**Flong/mat/matrix**  
A lightweight paper mold created from a metal plate and then distributed by syndicates to newspapers.

**Stereo/stereotype**  
A metal plate cast in lead alloy from a flong or mat.

**Lead alloy**  
Made primarily of lead with added tin and antimony, this fast-cooling alloy was used by newspapers (and printers generally) to cast small items and entire pages as plates.

**Zinc/zinco**  
A zinc plate coated with photosensitive chemicals etched to produce a raised or relief surface.

**Dragon's Blood**  
A resin used during etching zinc plates in acid to control which portions of the metal were dissolved.

**ORIGINAL ART**



**THE CARTOONIST**

A cartoonist draws their strip typically at a much larger size than it will be reproduced in a newspaper. The artist draws black lines and areas of black. For tints, the cartoonist may stipple (inking patterns of dots) or cross-hatch (the same with lines). But they could instead mark tints for an engraver in a later stage.

George McManus draws  
"Bringing Up Father."  
"Making of a 'Funny,'"  
*Popular Science*, 1940

George Herriman  
("Krazy Kat")  
sitting at his  
drawing table.  
c. 1900s. MCA at BICLM



Nina E. Allender,  
cartoonist,  
*The Suffragist*  
Harris & Ewing, c. 1916



Winsor McCay sketching  
at parade with child  
dressed as Nemo at left.  
Bain News Service, 1908



Charles M. Schulz  
inking an early  
"Peanuts" strip  
Jim Hansen,  
*Look magazine*, 1958



Right:  
Milton Caniff,  
with three of his most  
famous characters  
c. 1950s. Milton Caniff  
Collection, BICLM



## NEGATIVES

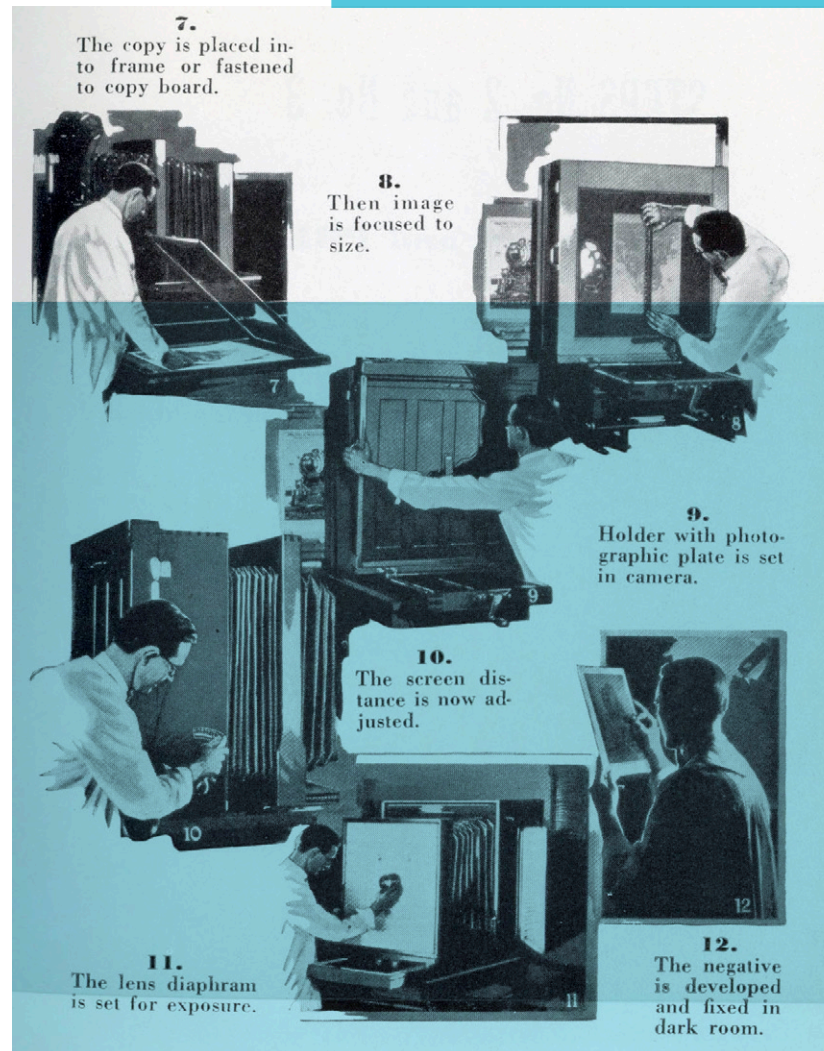
# THE SYNDICATE

# AND ENGRAVERS

6 | HOW COMICS WERE MADE

The original art is handed off to a syndicate, which needs to shrink it to the size or sizes used in newspaper clients and produce a form that newspapers can use to create their layouts.

A syndicate may have had in-house production or, also commonly, worked with an engraving company for some or all of the following.



This process starts by creating a film negative using a large camera. The comic strip is optically reduced to expose onto the negative.



A camera operator captures an installment of "Bringing Up Father" on a negative.  
"Making of a 'Funny'"

This numbered illustration shows a sequence of placing the art in position, adjusting the reduction, exposing a negative, and developing it.

Horan Engraving Co., *The Art And Technique Of Photo-Engraving*, 1952





**Above left:**  
An engraver at the *New York Times* examines a negative's quality (here of a photo) before it is exposed onto a zinc plate.

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Marjory Collins, 1942

**Above right:**  
A negative assembler examines a sheet of negatives prepared for the next step.

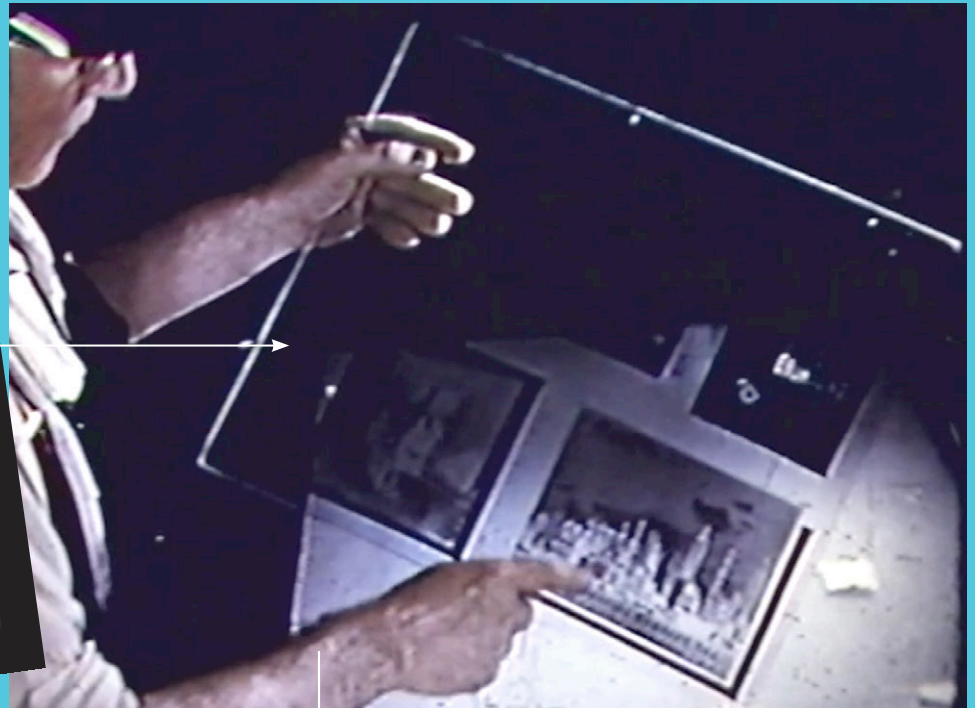
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Horan Engraving Co., 1950s

**Bottom:**  
An engraver gently peels off the negative from the exposed plate to move to the next stage.

---

"Making of a 'Funny'"



## ZINC PLATES



A zinc metal plate coated with a photosensitive emulsion (shown lower right) is placed beneath the film negative in a frame glass panel, which is clamped tightly shut (above). An intense light exposes the zinc plate for tens of seconds through the clear areas of the negative. For Sunday color comics, four identical plates are made for each of the four printing colors cyan, yellow, magenta, and black, which are further treated in later stages.



**Top left to right:**  
A worker clamps the negative onto the plate in a frame and turns a timer for exposure.

Horan Engraving Co.

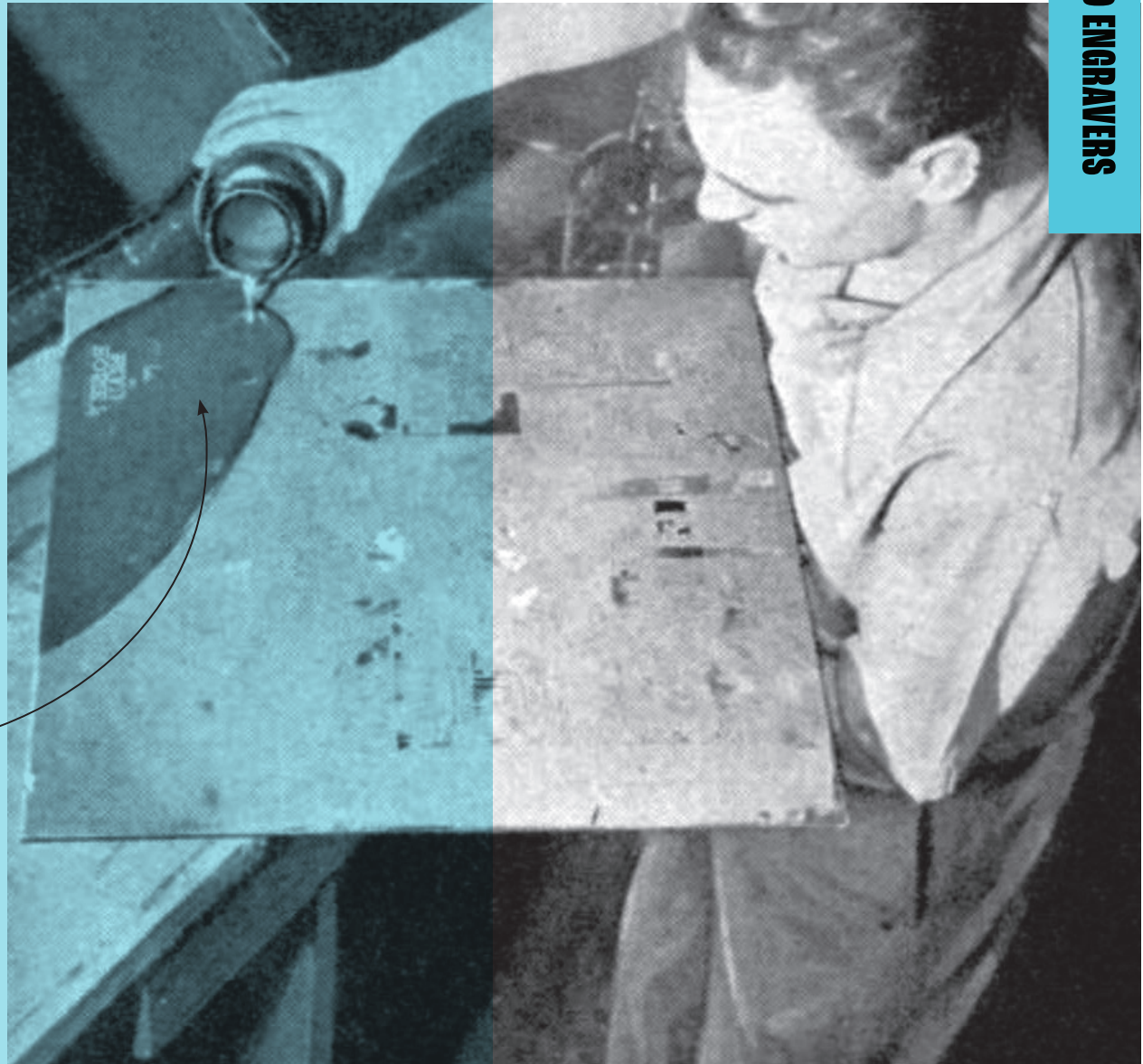
**Bottom right:**  
An engraver coats a zinc plate with emulsion.

“Making of a ‘Funny’”

The zinc plate's photosensitive layer gets developed and then coated with a fixative to prevent the image from further exposure. Where lines, tints, and areas of black appeared in the original art and will appear in print, the hardened emulsion remains in place.

“Fix” or fixative is poured over an exposed zinc plate to prevent further development.

“Making of a ‘Funny’”

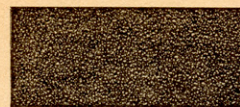


# ZINC PLATES

If tints or areas of solid black are needed for daily black-only or full-color cartoons, a specially licensed production person uses the “Ben Day” process, an elaborate sequence to apply patterns. These patterns could be a regularly spaced series of dots of the same size, simulating a percentage of black or another color, or specialty patterns like those at right. A Ben Day artist paints around the

area (masking it) with a yellowish, water-soluble resin called gamboge. After the gamboge dries, the artist applies oily ink to a Ben Day screen that had the pattern on it as a series of raised dots or lines. Using a special apparatus, they then burnish the screen onto the plate. Then the gamboge is washed off, leaving the oily pattern. (For details, see “How Comics Got Their Color.”)

Commonly available Ben Day screens appear in a sample book by a major engraving company.  
Jahn & Ollier Engraving Co., *Ben Day*, c. 1930



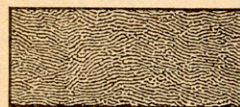
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No. 305



No. 306



No. 309



No. 310



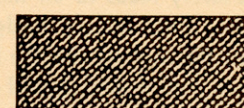
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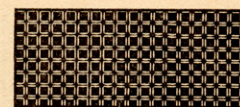
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No. 324



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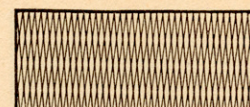
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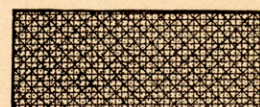
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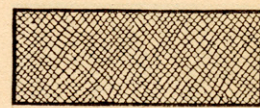
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No. 733



No. 734



No. A



No. H 2



No. J

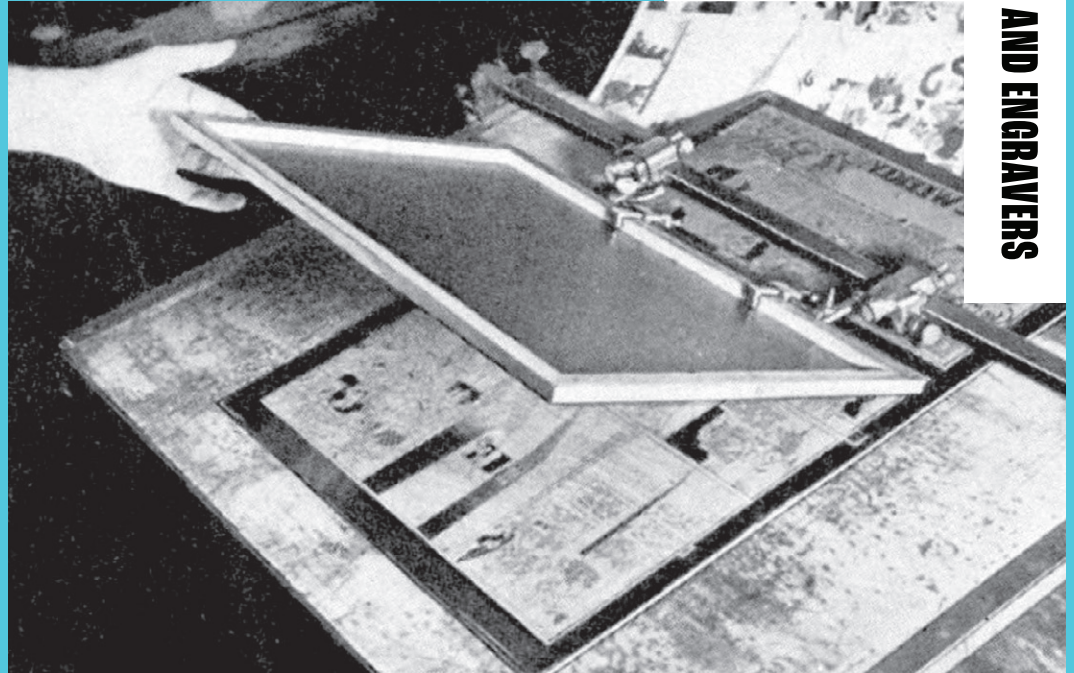


No. O

## THE SYNDICATE

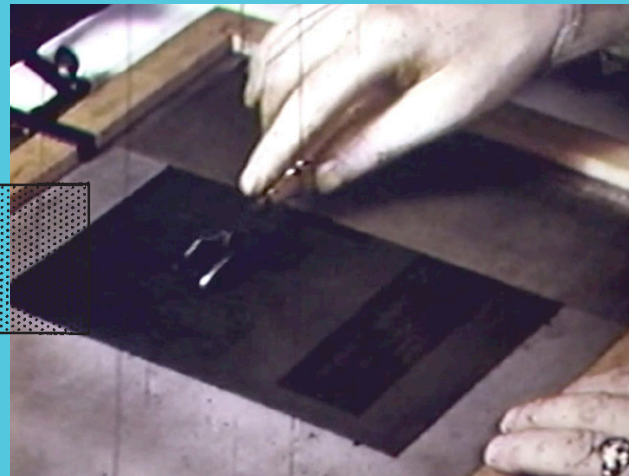
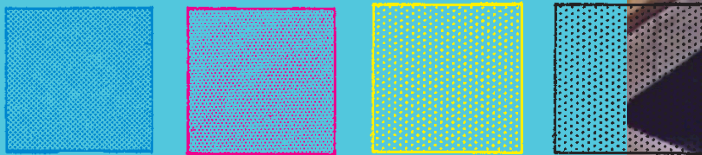
## AND ENGRAVERS

Masking with the gamboge.  
Horan Co., Photo-Engraving



Preparing to ink a Ben Day screen onto a plate.

“Making of a ‘Funny’”



Burnishing the ink through a Ben Day screen.  
Horan Co.,  
Photo-Engraving

## ZINC PLATES

Zn

12

HOW COMICS WERE MADE

Next, a worker prepares the zinc plate for etching. This involves brushing it with an acid resist—a resin called Dragon’s Blood. Any area on the plate that wasn’t hardened under light or painted with a Ben Day screen is etched away. This leaves a raised portion that matches what needs to be printed, and a relief beneath it that will not. The zinc plate receives several *bites*, or passes, through the etching

bath. More metal is eaten away on each pass until the required depth of relief—the distance from surface to background—is reached. Between bites, Dragon’s Blood is reapplied with a brush in four directions. Once etching is completed, a worker uses a router to cut away unused parts of metal to reduce the weight and make it easier to reproduce in following steps.



**Above:**  
Examining  
a zinc plate  
removed from  
the etching  
bath.

*From Trees to  
Tribune, c. 1931*



**Left:**  
Brushing a zinc  
plate between  
etchings with  
Dragon’s blood.

*“Making of a ‘Funny’”*



## THE SYNDICATE

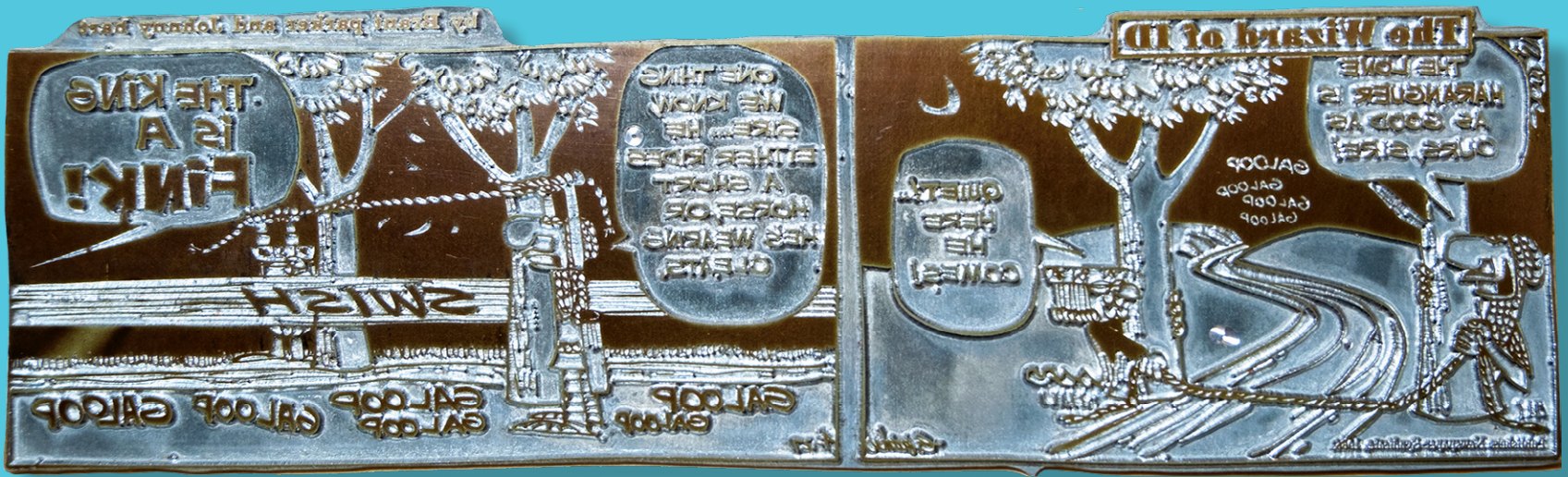
### AND ENGRAVERS

**Left:**  
A worker routes out unnecessary metal from the zinc plate.

“Making of a ‘Funny’”

**Bottom:**  
A zinc plate created for “The Wizard of Id,”  
27 April 1966.

Author’s collection



# FLONG

14

HOW COMICS WERE MADE

After additional finishing steps, workers create molds, called “flongs” or “mats” (from matrix or matrices, a word for mold) by pressing a piece of raw, thick, flexible material that’s like thick index paper against the zinc plate. This mold can be used to re-create the original plate. Depending on the strip, dozens to over 1,000 mats might be made for each installment. The six Monday through Friday strips were arranged into a single sheet for easier production and shipping.



A worker makes a sheet of comics flong for a syndicate in a press, then removes it for examination.

“How Cartoons Are Syndicated,”  
*Popular Mechanics*, March 1926



## THE SYNDICATE

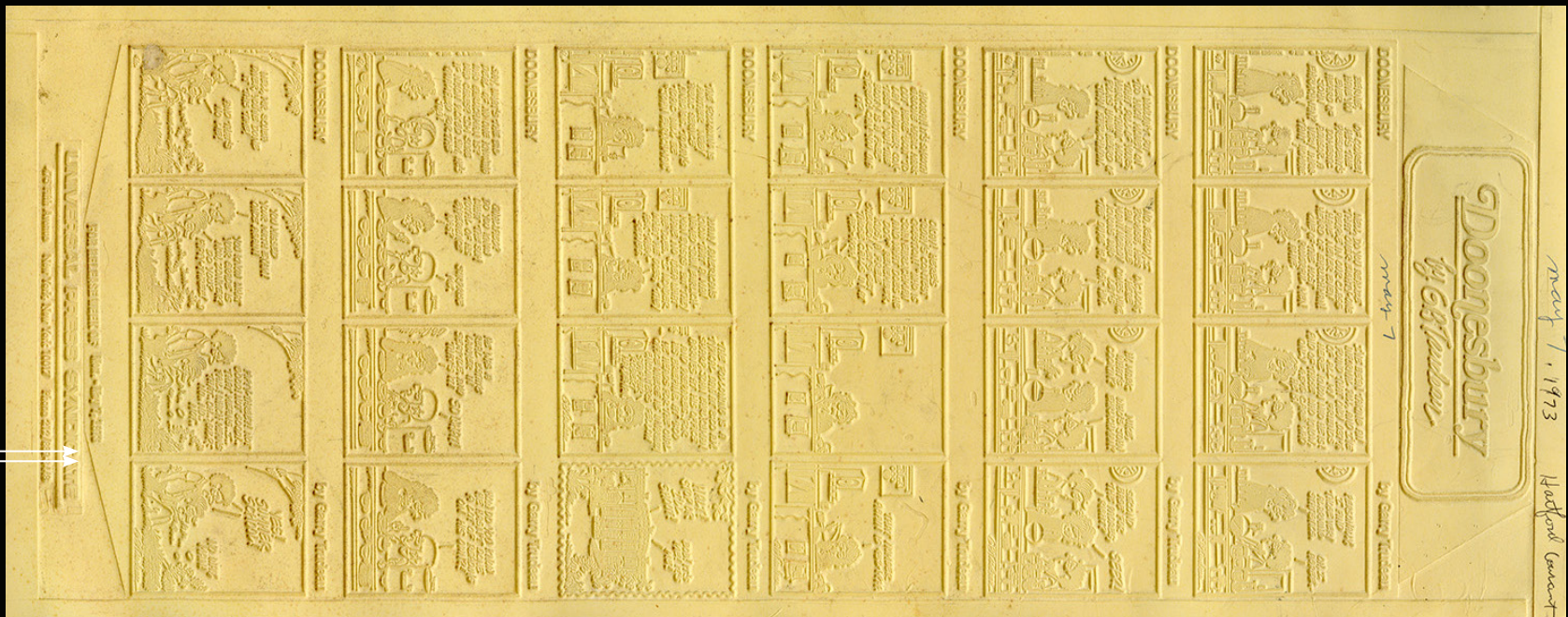
## AND ENGRAVERS



GARY TRUDEAU

"I never fully understood the process, having never witnessed comics prep first-hand. I'm delighted to learn the word 'flong,' which is new to me!"

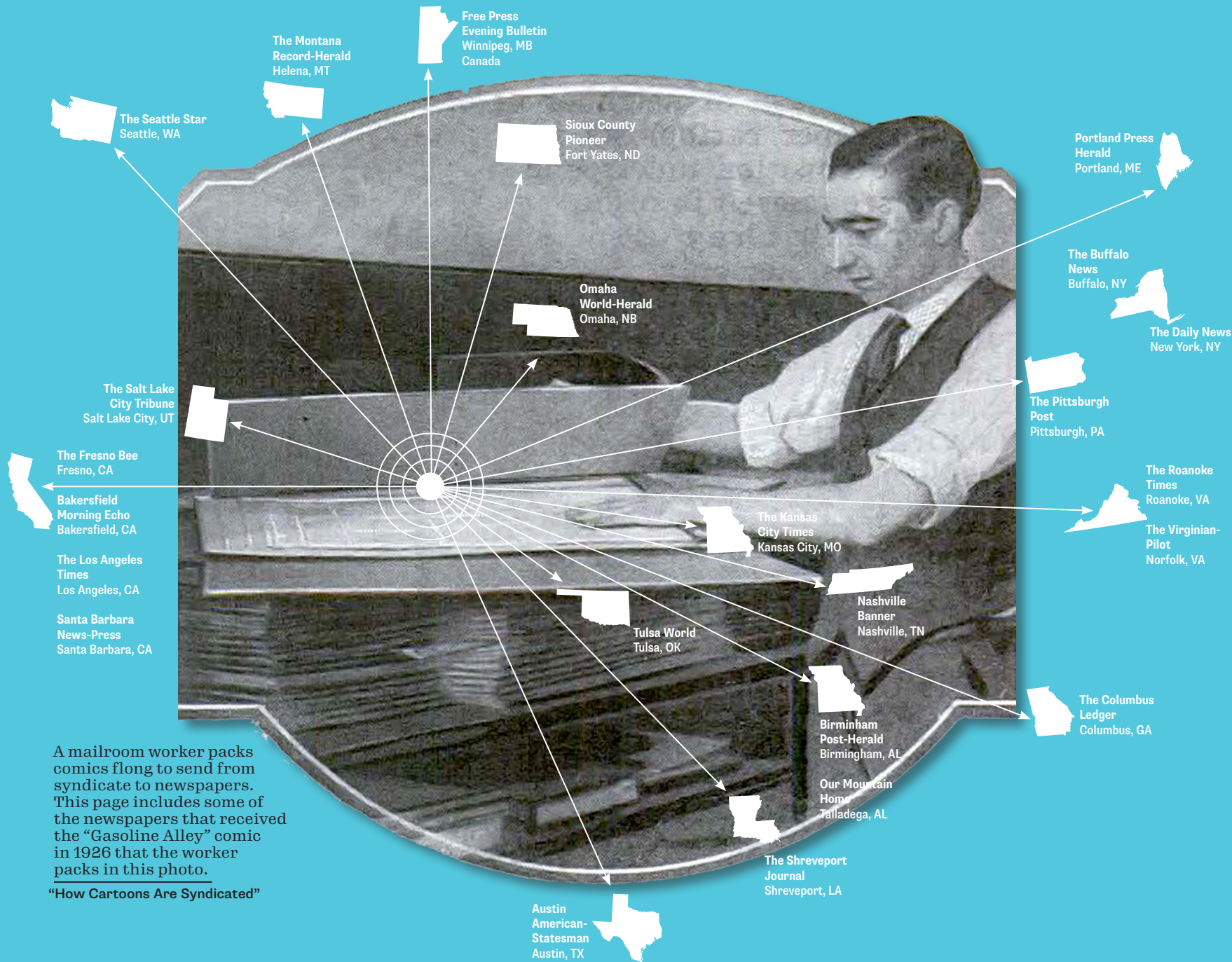
- via email



A sheet of six daily (Monday to Saturday) black-and-white Doonesbury comic strips on a sheet of flong (rotated to fit) from May 1973 preserved before use from mats sent to the *Hartford Courant*

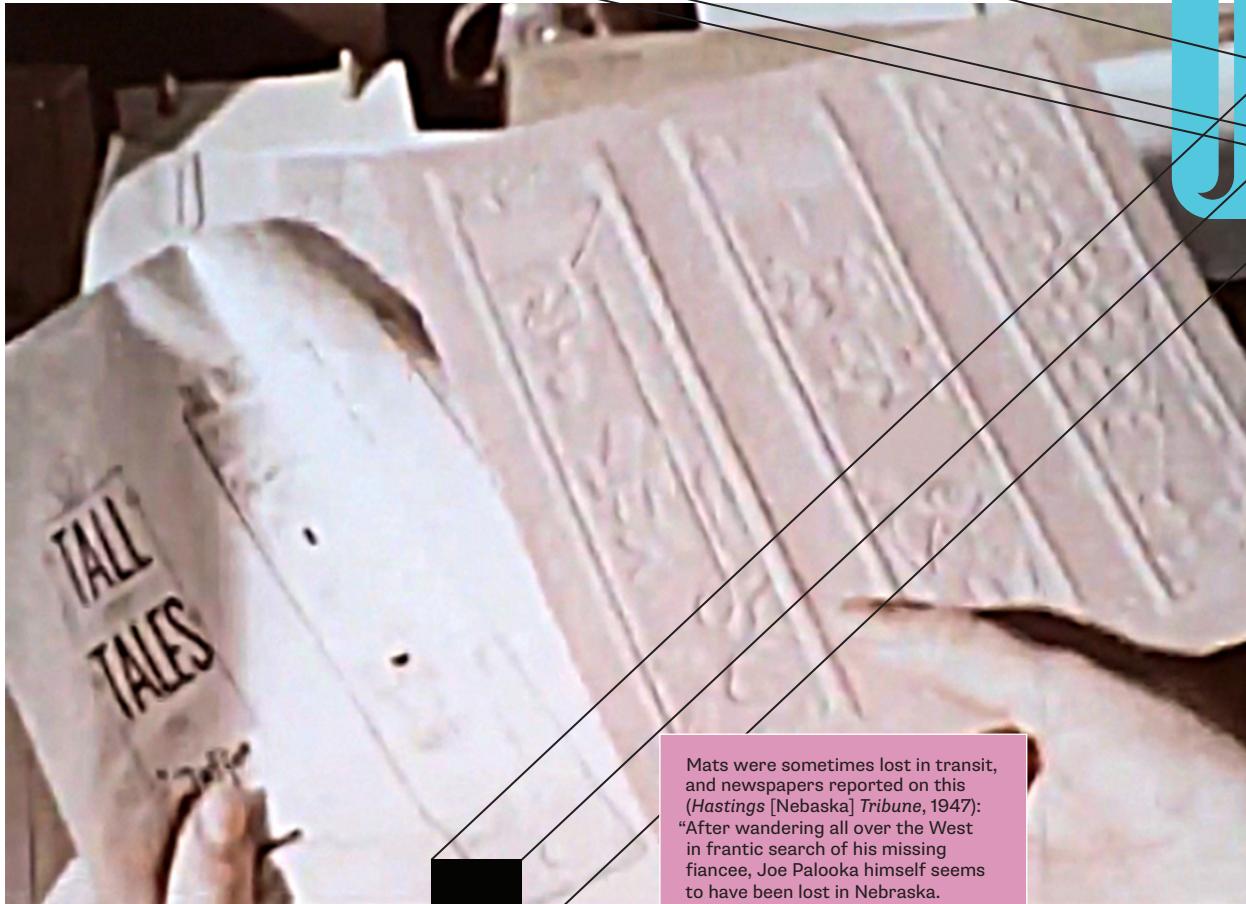
Author's collection

# FLONG



A mailroom worker packs comics flong to send from syndicate to newspapers. This page includes some of the newspapers that received the "Gasoline Alley" comic in 1926 that the worker packs in this photo.

"How Cartoons Are Syndicated"



A sheet of Al Jaffee's "Tall Tales" flongs and a proof sheet received at a newspaper office.

*Los Angeles Times, A Newspaper Serves its Community, 1959*

Mats were sometimes lost in transit, and newspapers reported on this (*Hastings [Nebraska] Tribune, 1947*): "After wandering all over the West in frantic search of his missing fiancée, Joe Palooka himself seems to have been lost in Nebraska. And as a result readers of the *Fairbury Daily News* may have to wait awhile for the installments of the popular comic strip. Newspaper mats of the feature arrived in Fairbury [Nebraska] on schedule, but because the package was addressed to Don Shearon, formerly news editor of that paper, it was forwarded to him in Hastings...Now Joe is on his way back to Fairbury."

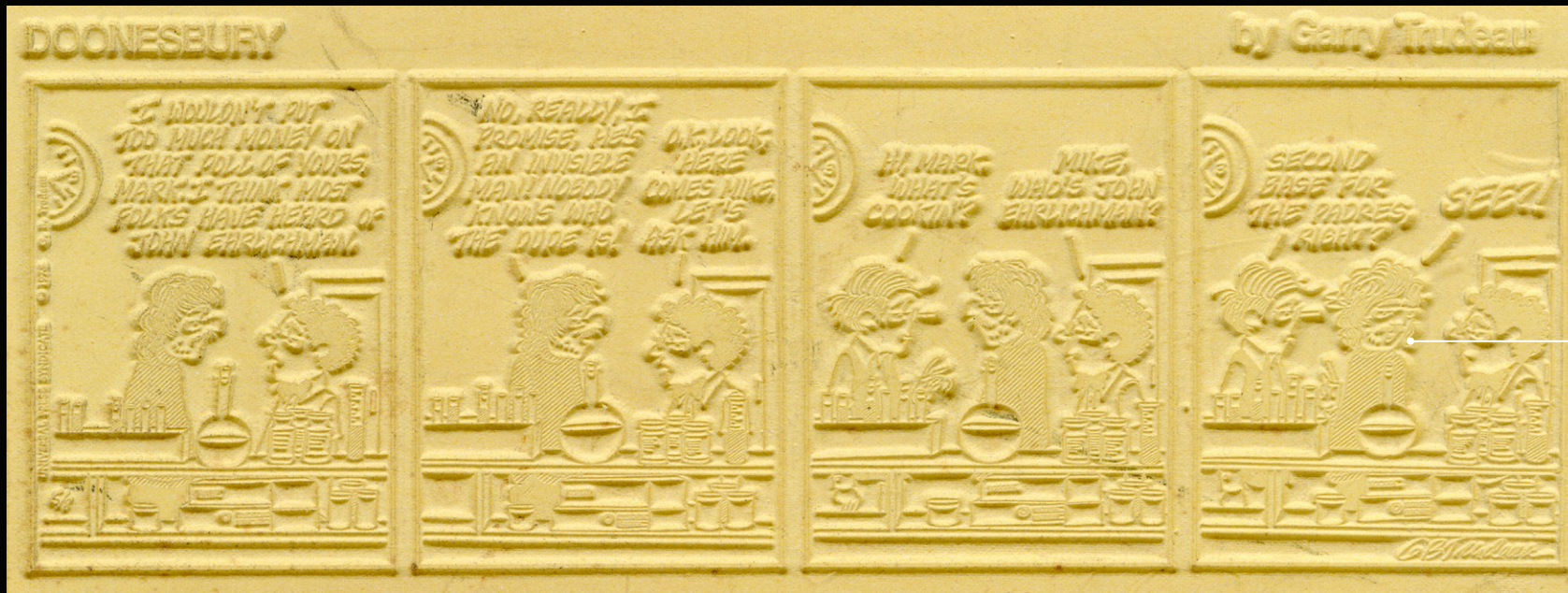
## THE NEWSPAPER

A newspaper had to turn the mold back into a relief plate from which they could print. They liked doing it so much they did it twice! The reason follows.

The newspaper's receiving office opens and processes flongs from syndicates—often from several different syndicates. They also received ads in this fashion as well as illustrations and photos for syndicated columns.

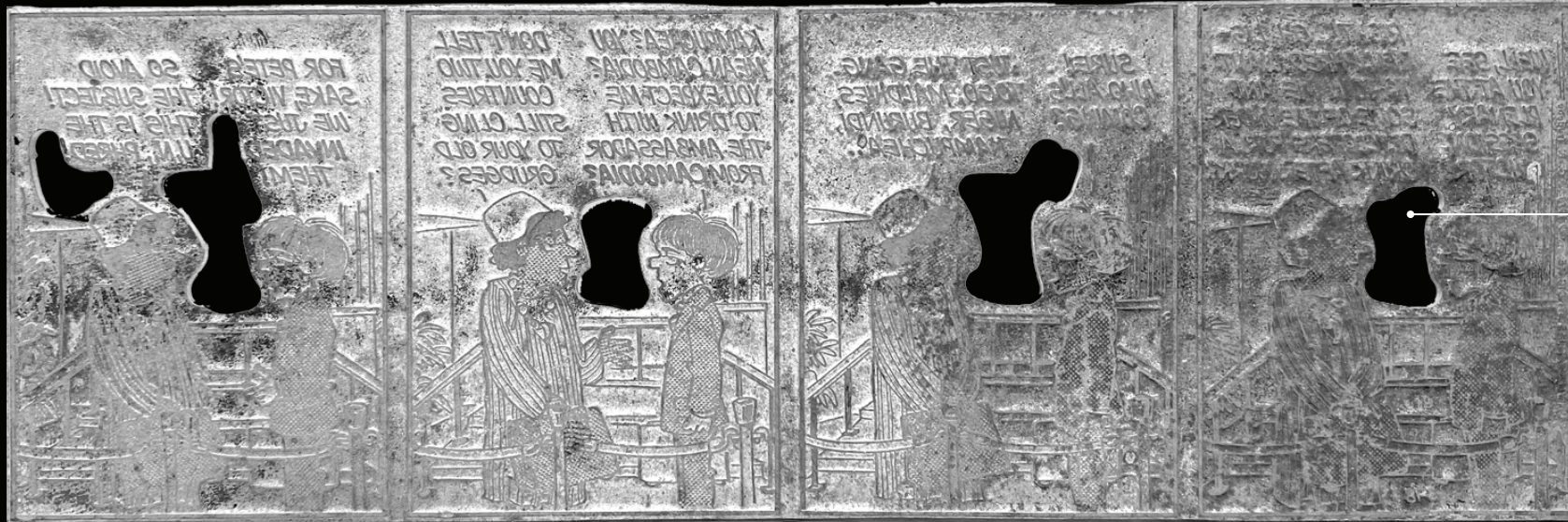
# STEREO

A single daily Doonesbury comic in flong form from 8 May 1973. | Author's collection



18 HOW COMICS WERE MADE

A Doonesbury stereotype cast at a newspaper for a May 1978 paper. | Author's collection



In the stereo department—stereo being short for “stereotype,” the term for cast lead alloy printing plates—workers take the mat, put it into a flat caster, and pour in hot lead alloy. This solidifies almost immediately. The flat plate essentially reconstructs the original etched zinc plate. The lead-cast strips are cut and filed to size.

You’d think this might be the last stage, but it is not. Layout artists compose a comics page with headlines, text, crossword puzzles, and other matter along with the cast comic strips, aligning all the non-typeset items to be “type height,” or the plane of the printing surface (0.918” in America).



A page-makeup person fits the last pieces into a text-heavy daily newspaper page. No photos of comic-page layouts are known to survive.

Marjory Collins, 1942

STEREO

# THE COMIC WEEKLY

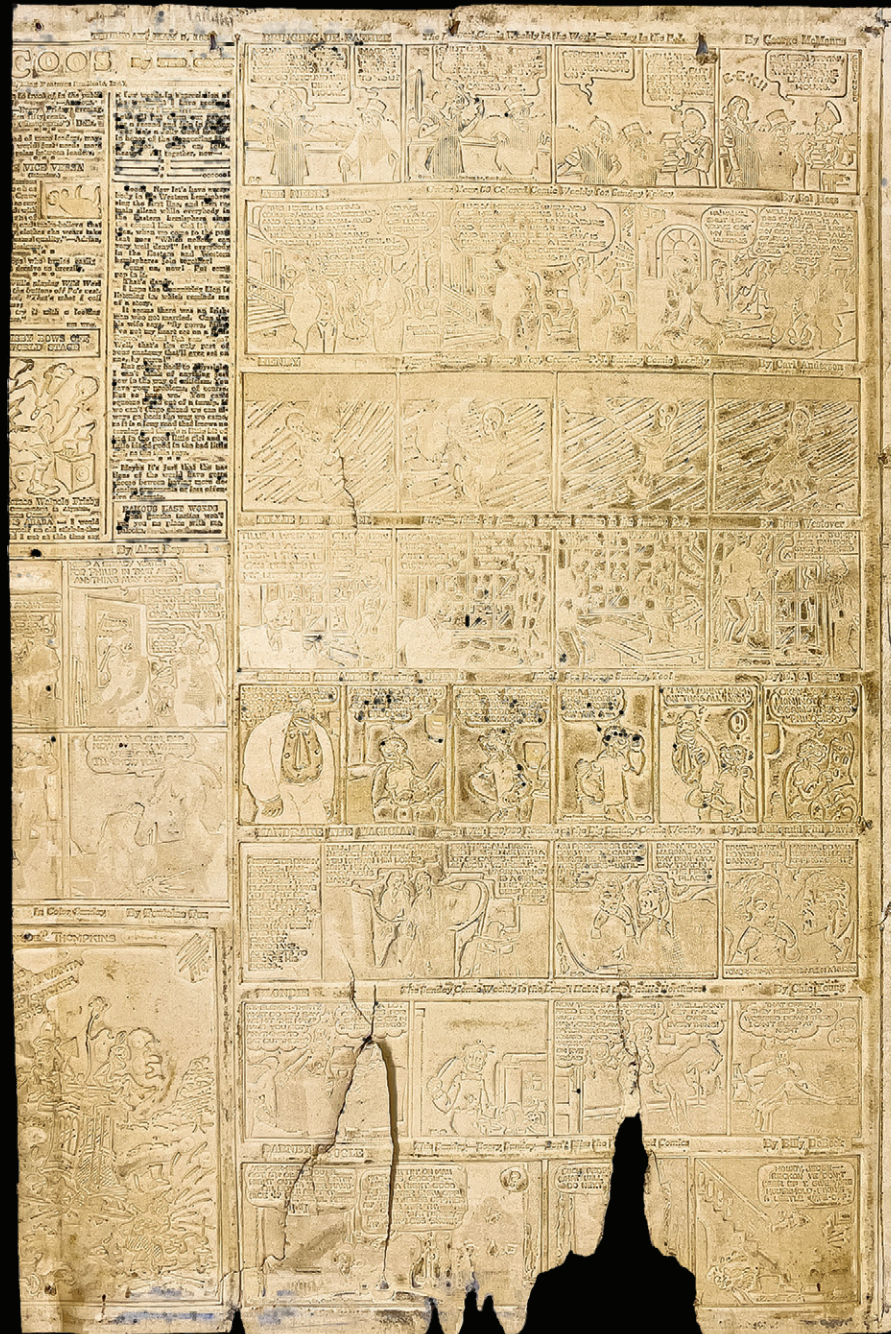


A press operator pulls a proof of the laid-out page before the page is used to make a full-page flong.  
"Making of a 'Funny'"

When approved by an editor, the laid-out page is put on a flat proofing press, and a proof sheet is made by contact. After inspecting the proof, the page is itself turned into a flong—this time, a full-page one used for the very final transformation to go onto a newspaper press.



A worker creates a full-page flong from the laid-out comics page.  
“Making of a ‘Funny’”



The comics page of the *Seattle Post-Intelligencer*, 9 May 1935 as a full-page flong, ready for casting.  
Author's collection



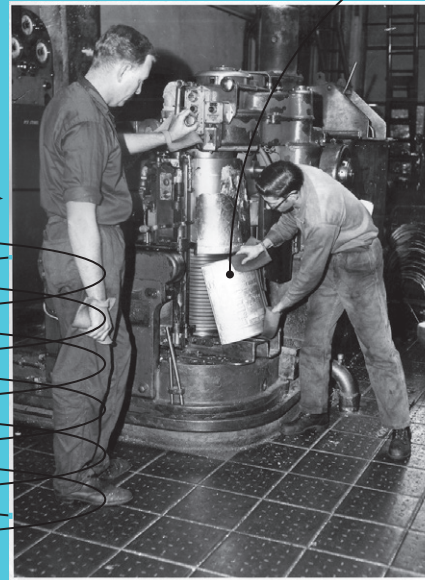


Stereo room workers prepare a full-page flong for casting by adding felt to low areas that would sag during the process.

Marjory Collins, 1942

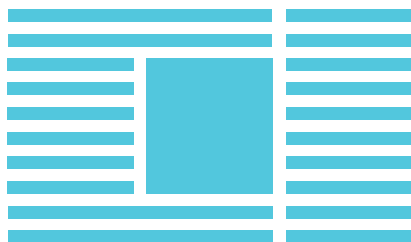
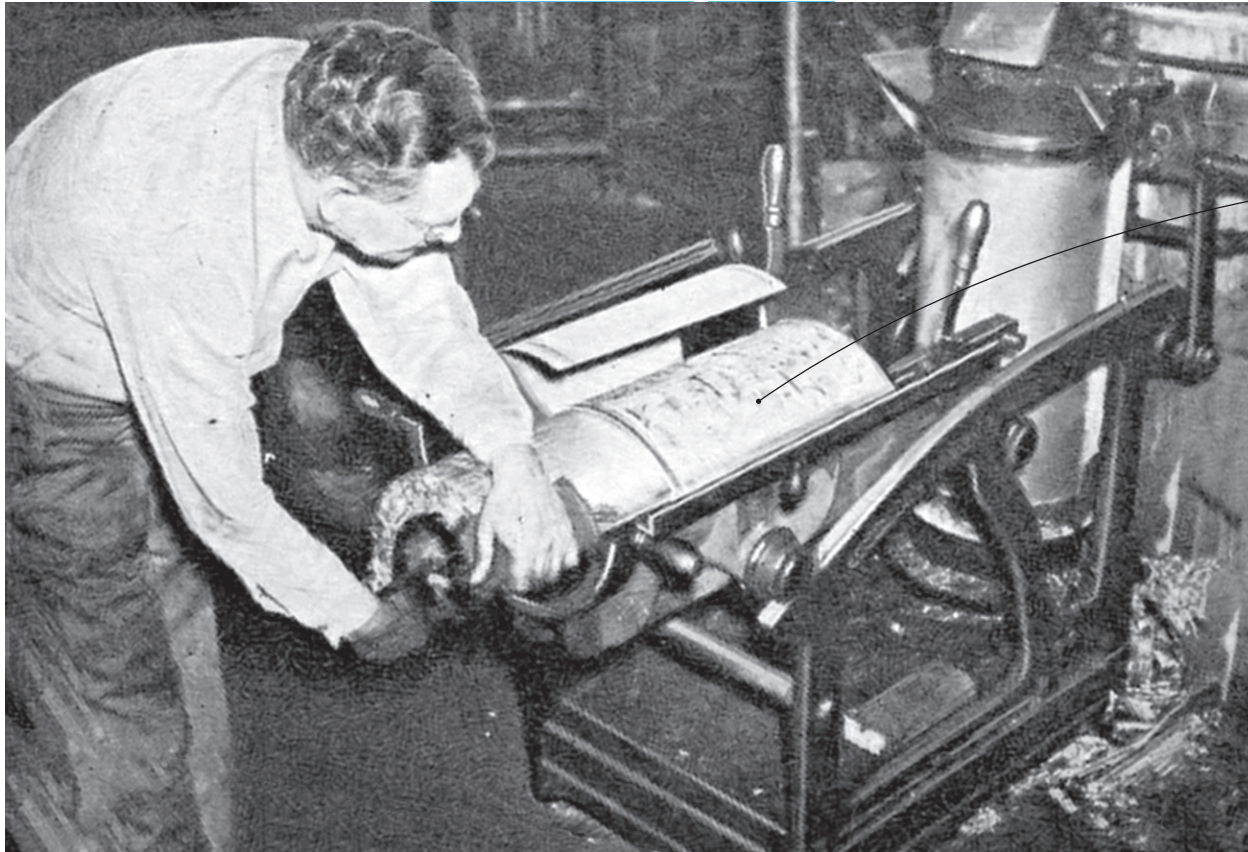
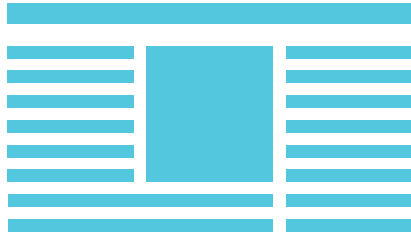
The Sydney Herald stereotyping department workers unload a curved sterotype from a stereotype caster.

Source unknown, 1962



The flong is bent into a half-round—often using another custom device that heats and bends it—and placed into special casting equipment that creates a full page of a newspaper as a hemispherical plate that will be mounted on rotary presses. The plate is trimmed and cleaned up, and often put on a conveyor belt that carries the roughly 40 lb (18 kg) hunk of metal to the press room.

# CURVED STEREO



A worker removes a stereotype plate made from the flong from the casting unit.

“Making of a ‘Funny”



Curved stereotype plate (parts missing) from an unknown newspaper, 1970s era.  
Author's collection

## CURVED STEREO

26

HOW COMICS WERE MADE

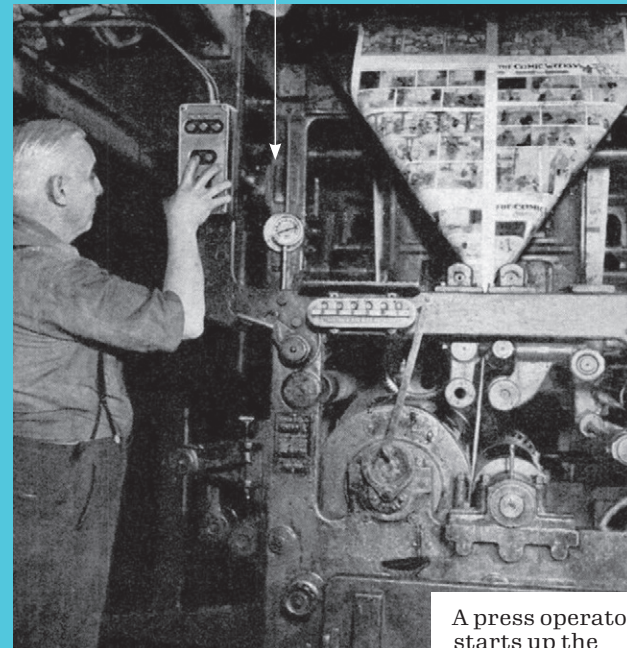
In the press room, a press operator hoists the plate onto the press and locks it in place. When all the plates are ready, the operator starts the press at low speed and checks quality, then ratchets up to full speed.



A press operator loads a plate onto the rotary press.

Marjory Collins, 1942

The paper whizzes at high speeds between rotating plates, which first pick up ink and then rotate to press it directly onto paper. At the far end, the printed paper is cut, folded, gathered, bound in bundles, thrown on trucks, and sent out into the world.



A press operator starts up the printing press to run the comics pages.

"Making of a 'Funny'"

THE

READER

Finally, the comics reader gets the newspaper at a newsstand, train station, airport—or their front step! They can read the most important part of the paper: the comics.

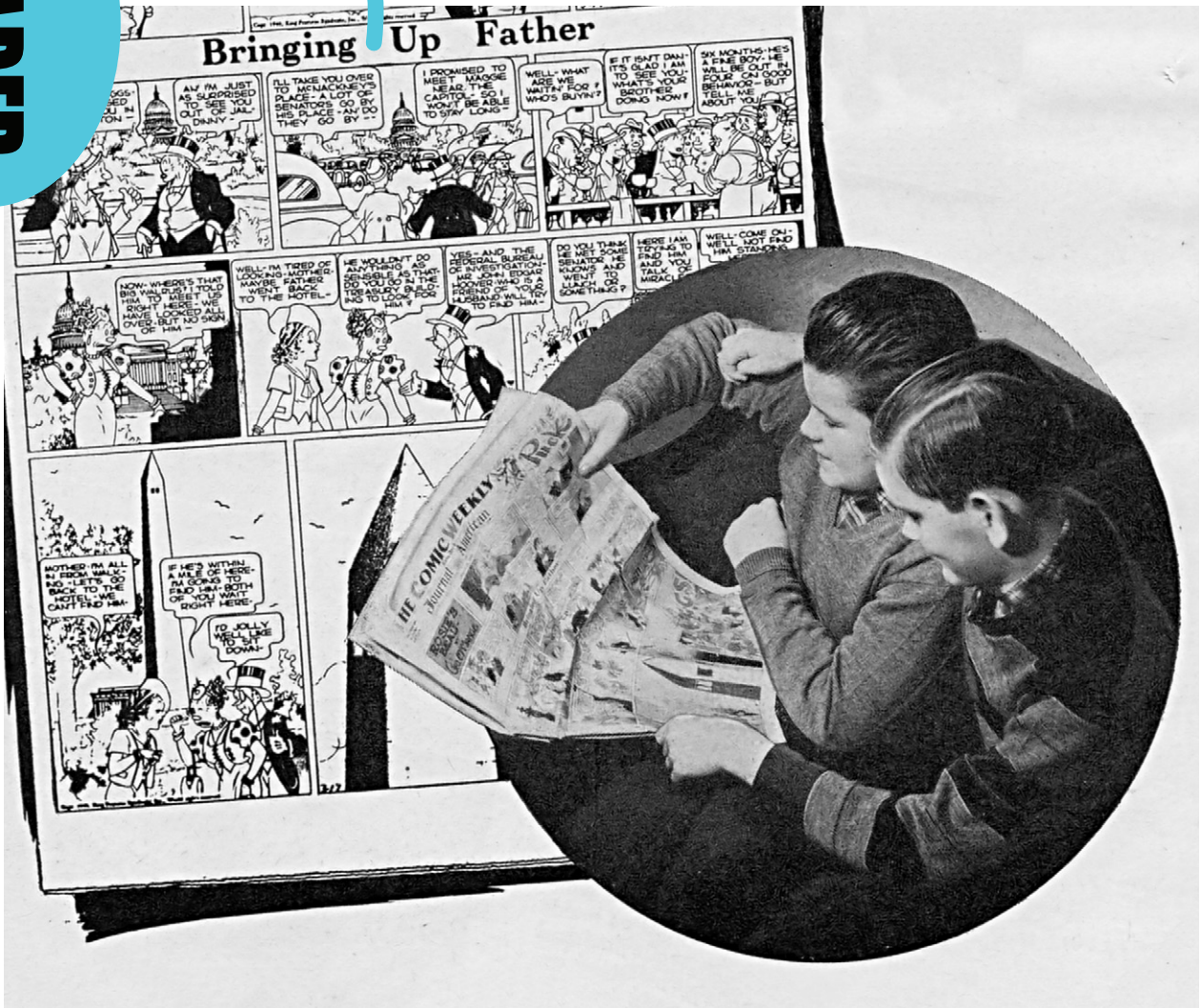


Above: A reader examines the comics pages.

*Newspaper Story*, Encyclopedia Britannica Films, Inc, 1950

Above Right: The printed version of a page of comics, with an inset that shows kids reading that page.

“Making of a ‘Funny’”



# SOURCES AND ACKNOWLEDGEMENTS

This preview chapter includes the following materials. Brief citations in the chapter are reproduced here in full. (Images and layout may change before the final version of the book.)

## Photos

- Nina E. Allender, photographic service Harris & Ewing, c. 1915. Via Records of the National Woman's Party (Library of Congress). Finding details: National Woman's Party Records, Group II, Container II:274, Folder: Individual Photographs Nos. 1-17 "A." (Public domain: term of copyright expired.) <http://hdl.loc.gov/loc.mss/mnwp.274001>
- Milt Caniff, photographer and source unknown, 1950s. Image via the Milton Caniff Collection, The Ohio State University, Billy Ireland Cartoon Library and Museum. (Copyright status unknown after due diligence.) [https://library.osu.edu/dc/concern/generic\\_works/g7330s348?locale=en](https://library.osu.edu/dc/concern/generic_works/g7330s348?locale=en)
- George Herriman, photographer and source unknown, 1900s. Image via the International Museum of Cartoon Art (IMCA) Collection and Records, The Ohio State University, Billy Ireland Cartoon Library and Museum. (Copyright status unknown after due diligence.) <https://hdl.handle.net/1811/550a5528-3087-43d7-b875-b1f2a9c44755>
- "Making of a 'Funny,'" **Popular Science**, June 1940. Article by Edward W. Murtfeldt; photographer uncredited. (Public domain: failure to renew copyright.)
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- **New York Times** production photos, photographer Marjory Collins, 1942. Finding details: A large collection via the Farm Security Administration - Office of War Information photograph collection (Library of Congress). Use <https://www.loc.gov/search/?q=new+york+times+collins> to find images. (Public domain: U.S. government owned.)
- Theodore Dudley "Red" Saunders, his wife Ella, their children, and their dog; photographer Jack Delano, April 1942. Via the Farm Security Administration - Office of War Information photograph collection (Library of Congress). Finding details: LC-USW3- 001482-D [P&P] LOT 192 (corresponding photographic print) fsa 8d03744 (Public domain: U.S. government owned.) <https://hdl.loc.gov/loc.pnp/fsa.8d03744>

- Charles Schulz, photographer Jim Hansen for **LOOK** magazine, 1958. (Public domain: copyright transferred to the United States.) <https://www.loc.gov/item/2020630135/>
- Sydney, Australia, stereotyping department, 1962. (Public domain: Creative Commons Attribution-ShareAlike 4.0 International; credited to StVincent24a.) [https://commons.wikimedia.org/wiki/File:Semi-Automatic\\_Stereo\\_Plate\\_Casting\\_Machine\\_\"Breaking\\_off\"\\_for\\_Sydney\\_Morning\\_Herald\\_Aust.1962.jpg](https://commons.wikimedia.org/wiki/File:Semi-Automatic_Stereo_Plate_Casting_Machine_\)

## Book Pages and Video Stills

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- Horan Engraving Co., **The Art And Technique of Photo-Engraving**, 1952, book and movie. (Public domain: failure to renew copyright.) <https://archive.org/details/the-art-and-technique-of-photo-engraving> <https://vimeo.com/134626010>
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- Indian Film Co., **From Trees to Tribunes**, c. 1931. (Public domain: failure to renew copyright.) [https://archive.org/details/0194\\_From\\_Trees\\_to\\_Tribunes\\_M0026\\_13\\_14\\_34\\_20](https://archive.org/details/0194_From_Trees_to_Tribunes_M0026_13_14_34_20)
- Los Angeles Times, **A Newspaper Serves its Community**, 1959. (Copyright status unknown after due diligence.) <https://archive.org/details/66904-newspaper-serves-its-community-vwr>

## Other Material

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