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Mark Rosewater · Making Magic
 Monday, May 24, 2004

The origins of cogs and gears

Welcome to Machine Week! This week we'll be touching upon one of the major themes of *Fifth Dawn*. (For more on how this theme came to be, see my first *Fifth Dawn* preview column, "[Dawn of a New Day](#)".) To better explore this theme, I thought I'd use my column this week to look at two minor mechanics of the set that play into the machine theme. Yes, today you shall learn of the origin of the cogs and the gears.

The Gear of the Cog That Bit Me

I guess I should start by explaining what exactly the cogs and gears are. And I'll do that. Eventually. But hey, what would one of my columns be if I didn't take you off on a giant tangent first? I'd like to start the cogs' and gears' life story by sharing part of an e-mail I sent out to the *Fifth Dawn* design team (Randy Buehler, Aaron Forsythe, Gregory Marques and myself). Be warned. I'm going to jump in to make comments.

Theme #1 - Machine Feel

During the first part of design, we agreed that we all liked the old feel of artifact decks that had a machine feel. The idea that you put all these pieces together and then the deck starts interacting in cool ways to do all sorts of different things. This seems to break into a number of different mechanics functions: (I put a rough guess after each mechanic to show about how big I felt it is. Be aware, that these numbers will change, some stuff will get cut and there will be cards that overlap.)

This e-mail is interesting because it happened during the middle of design. As you will see, *Fifth Dawn* changed a bit during the rest of design and development.

- Goldberg cards** - These are artifacts with tap effects that untap when a certain other effect happens. These cards are going to be designed so that cards can be linked together and will complete a loop if they are all used. (4-6 cards) Rarity: uncommon & rare

This mechanic went on to be known as the gears in design and the stations upon release. More on this in a bit.

- On/Off** - These are artifacts with two global effects, one when they are on and one when they are off. A variant are cards with a good tap ability that have a negative global effect when tapped. (3-5 cards) Rarity: common & uncommon (possibly a weird rare)

While *Fifth Dawn* design was going on, the *Darksteel* development team was meeting. One day I noticed the card All Suns' Dawn in the *Darksteel* file. I was on the *Darksteel* design team but the card had been added in development so I had never seen it before. Regrow a card of each color? Wait a minute, I thought, cards that reward playing five color decks. That's our theme! So I convinced Henry Stern, the lead developer of *Darksteel*, to trade it to me. In return, I gave him the card that is now known as **Thunderstaff**. Why do I bring this up? Because that is the only on/off card to ever see print.

- Wands** - These are artifacts with two functions divided by color. This is the one category that overlaps the two themes. (5 cards) Rarity: uncommon

The idea behind these cards were artifacts that had two different activations each using a different color. In the end, these cards were killed because they promoted two color play rather than five color play.

- **Animated** - These are artifacts that do normal artifact things but have the ability to be animated. Some can self-animate. Others become animated with certain events happen. (3-8 cards) Rarity: common, uncommon and rare

The only two cards of this theme to make it into *Fifth Dawn* were Ensouled Scimitar and Guardian Idol. At one point in the file there were a bunch more.

- **Cogs** - This is a new idea that I wanted to play around with. The idea was to have more 0 and 1 cost artifacts with small effects and then have cards that help add utility to these cards. (4-7 cards) Rarity: common (cogs) common & uncommon (Cog helpers)

Here's where I reference cogs. More on this in a bit as well.

- **Engine Cards** - These are cards that turn one resource into another. While every set has a few of these, Tomato needs to have more. (8-12 cards, be aware that all the Goldberg cards are engine cards) Rarity: uncommon and rare

Engine cards tend to be the cards that the machine decks get built around. As such, we made sure to put a number in *Fifth Dawn*. (among them: Blasting Station, Clock of Omens, Grinding Station, Krark-Clan Ironworks, Myr Servitor, Salvaging Station, Staff of Domination, and Summoning Station).

- **Batteries** - These are cards that build up a resource over time. The idea being that the machine has to take time stockpiling some resource that it can use when it starts to do its thing. (2-4 cards) Rarity: uncommon and rare



We ended up designing a number of different types of batteries. Gemstone Array lets you save up unused mana. Doubling Cube lets you turn a lot of mana into a *lot* of mana. Krark-Clan Ironworks lets you turn artifacts into mana. And Mycosynth Golem can make all your artifact creatures potentially free.

- **Spouts** - These are artifacts that allow you to turn a resource into some effect that will either win you the game or help you control the board. A classic example of this would be Rocket Launcher (which we should definitely update) (4-8 cards) Rarity: uncommon and rare (possibly a common or two with little effects)



As you can see, we did redo **Rocket Launcher** (Goblin Cannon) as well a couple other mana-centered spoils (Avarice Totem, Chimeric Coils, and Staff of Domination).

So why did I start with this e-mail? First off, because it's an interesting relic. *Fifth Dawn* is the only design team ever run through e-mail so I have all kinds of moments of design captured in print. It seems only fair to let you all enjoy the fruits of this fortune. Second, it demonstrates the focus the team put on the machine theme. (And remember this was only one of a handful of themes. Theme #2, for example, was the multi-color theme – later to become the five-color theme.) It was this focus that led to the creation of the cogs and gears. But enough of my digression, let's get on with the stories.

A Cog Eat Cog World

So I'm wracking my brain thinking about different ways to create cards for the machine theme when I came up with an interesting experiment. What if I thought about real life machines and came up with a way to represent them in **Magic**. As I was writing down words (like gears and engine), I stumbled upon the word "cog".

Cog has always had a special meaning to me. Oh what the heck, let's have another digression. (A digression within a digression – I got an e-mail recently that complained that I digressed too much in a current column and that in future columns I should be careful not to digress so much. Hmm, I thought, first time reader.) Before I designed **Magic** cards for a living I used to write for television (another recent letter complained that I hadn't mentioned my "Roseanne" gig in many months – so this reference is for him). Before I wrote for television I had a wonderful job known in the industry as production assistant (also known as "runner"). I think the term came about because fewer people applied for a "slave" position.

The role of a production assistant is to do all the crappy work that no one wants to do but someone has to do. The job involves long hours, small pay and almost zero respect, but it's an entry level position into Hollywood so the competition for this "crappy" job is quite intense. Anyway, I have many, many runner stories. Most of which are quite humorous (now). In future columns perhaps I'll explain my hour and a half journey for five sticks of gum or how I had to break into an apartment building to deliver a script, or how I found myself trapped inside Fred Astaire's estate.

The important point of this story is the realization I had one day about the role of a production assistant. We were cogs. We were cheap and easily replaceable but if one of us was missing when you needed us, all hell could break loose. There are some classic PA stories where hundreds of thousands of dollars are lost because a production assistant didn't do something when they were supposed to.

What does this have to do with **Magic**? Well, when I saw the word "cog" I flashed back to my runner days. And it made me think of the **Magic** equivalent. What were the cogs in a machine deck? And then it hit me. The cheap, little artifacts. The artifacts that only cost 0 or 1. They do all the grunt work without any of the credit. What if *Fifth Dawn* had a bunch of cogs (0 and 1 cost artifacts) and then a few cog-helpers? Cog-helpers would be cards that helped you make extra use of your cogs.

So I set out to make a number of interesting cogs and a few cog helpers. Here are the first few I put into the file:

[Cog Collector](#)

2

[Artifact Creature - Myr](#)

1/1

1,T: Return an artifact card with a converted mana cost of 1 or less from your graveyard to your hand.

Medical Kit

0 Artifact Sacrifice CARDNAME: Regenerate target creature.

Cogswell Cog Swapper

1

Artifact

1, Sacrifice CARDNAME: Return an artifact card in your graveyard with a converted mana cost of 1 or less to your hand.

Adrenaline Shot

1

Artifact

Sacrifice CARDNAME: Target creature gets +1/+1 until end of turn.

Myr Temp

0

Artifact

1: CARDNAME becomes a 2/2 NAME artifact creature. At end of turn, sacrifice it.

Design playtest showed several important things. One, we needed more cogs. And two, cog-helpers seemed better suited for colored cards. Here are the cogs and cog-helpers as they existed when we turned the file over from design to development:

UW02



Cog Collector

o1oW

Artifact Creature —Human Archaeologist

1/1

W,T: Return an artifact card with a converted mana cost of 1 or less from your graveyard to your hand.

When we decided to move the cog collectors to the colored cards, we debated where to put Cog Collector. In the end, we decided to let white be the artifact retrieval color. (This can also be seen in things like Bringer of the White Dawn.) Note that the card is identical except for the mana cost  becoming *.

CU03

Cog Prestidigitator

o2oU

Creature -Human Wizard

2/2

When CARDNAME comes into play, you may search your library for an artifact with a converted mana cost of one or less, reveal it, and put it into your hand. If you do, shuffle your library.

If white had access to the graveyard, it seemed only fair to give blue access to the library.

RU2

Survival of the Cogs

o1oUoU

Enchantment

U, Discard an artifact card with a converted mana cost of 1 or less: Search your library for an artifact with a converted mana cost of 1 or less, reveal it to all players, and put it into your hand. Afterwards, shuffle your library.

This card was directly inspired by Survival of the Fittest. As it searched the library, it also went into blue.

CA21

Medical Kit

o1

Artifact

Sacrifice CARDNAME: Regenerate target creature. 1W, Sacrifice CARDNAME: Regenerate target permanent. Draw a card.

CA22

Spit Stone

o1

Artifact

Sacrifice CARDNAME: Put the top two cards of target player's library into his or her graveyard.

1U, Sacrifice CARDNAME: Put the top four cards of target player's library into his or her graveyard. Draw a card.

CA23
Syphon Trinket
o1
Artifact

Sacrifice {insert:Cardtitle}: Target player loses 1 life and you gain 1 life. 1B, Sacrifice {insert:Cardtitle}: Target player loses 2 life and you gain 2 life. Draw a card.

CA24
Energy Pill
o1
Artifact
Sacrifice CARDNAME: Target creature gets +2/+0 until end of turn. 1R, Sacrifice CARDNAME: Target creature gets +4/+0 until end of turn. Draw a card.

CA25
Lotus Stem
o1
Artifact
Sacrifice CARDNAME: Add one mana of any color to your mana pool. 1G, Sacrifice CARDNAME: Add three mana of any combination of colors to your mana pool. Draw a card. Play this ability only any time you could play an instant.

To increase the number of cogs, I made a cycle of colored affiliated common ones. The idea behind them was that you could get a lesser version of the ability for colorless and a stronger version for colored mana.

UA19
Myr Temp
o0
Artifact
X: CARDNAME becomes a X/X NAME artifact creature. At end of turn, sacrifice it.

This is the favorite cog card I designed. You all know it as Chimeric Coils.

UA32
Skull of Cogs
1
Artifact
Sacrifice CARDNAME: Return up to two target artifact cards with converted mana cost of 1 or less from your graveyard to your hand.

This was my attempt to make a cog that was also an engine card. Mission accomplished. And you might have seen this card if development hadn't bothered to look at the card file.

RA15
Cog Gear
o5
ArtifactGear
T: Put a non-creature artifact card with a converted mana cost of 1 or less from your graveyard into play. Whenever a creature goes to a graveyard from play, you may untap CARDNAME.

One of the gears was designed to be a cog helper. I'm about to get to the gears, so if you're patient, you'll get a chance to hear a whole lot more about gears.

Now that we've talked about the cogs, it's time to peek in on the gears.

Gears of a Clown

The cogs were inspired by their name. The gears were inspired by a man named Rube Goldberg. If you've never heard his name, I recommend you [Google](#) it up. His claim to fame was comical machines (always drawn in cartoon form) designed to complete some mundane function. For example, let's say you wanted to cook microwave popcorn. The alarm clock wakes up the cat which knocks over the broom which starts the fan which pushes the balloon over the candle causing it to blow up sprinkling confetti which causes the cheerleader to start to cheer which startles the old man which causes him to bump into the microwave and start popping the popcorn.

How did Rube Goldberg's name come up? Well, I asked all of the *Fifth Dawn* design team to send me an e-mail explaining what they like about artifacts. My e-mail had the following snippet:

1) Things I like about artifacts

• I love artifacts that allow you to make "machine decks". I define "machine decks" as heavy artifact decks that all seem to click together to kill the opponent with some Rube Goldberg kill mechanism. Good example of past artifacts that fit this bill: [Stone Calendar](#), [Candelabra of Tawnos](#), [Rocket Launcher](#), [Ashnod's Altar](#), [The Hive](#) (or any token maker).



While re-reading my e-mail, I started thinking about the Rube Goldberg machines. This inspired the following e-mail:

Here is an idea for some design space we can explore to get more of a Rube Goldberg feel:

Rube's Pumper

3

Artifact

T: Target creature gets +1/+1 until end of turn.

Whenever a creature comes into play, untap CARDNAME.

The idea is that we make a cycle of artifacts in which each one's ability is the trigger to untap another artifact. This cycle could be as big as we want it to be.

What do you all think?

Mark

The interesting thing about the Rube Goldberg cards (aka the gears, aka the stations) was that it was a series of cards that made an infinite engine (if you weren't aware of this, if you get all four stations into play, it creates an infinite loop that does all sorts of stuff - if you're confused, Aaron will explain how on Friday) in which each of the individual cards was itself an engine card. An engine loop made out of engine cards. That set off my inner designer alarm.

The individual Goldberg cards/gears/stations are all cards you can build a deck around. By linking multiples together you can start creating chains of effects. This allows you to make decks that use two or three gears. If you get all of them in play, you get an infinite loop. This idea is what got me so excited that I wrote the above e-mail. In retrospect I could have spelled it out a little better, but the team members seemed to get the gist of what I was saying.

Greg responded to this post with an artifact whose tap effect triggered Rube's Pumper's untap effect. Aaron then followed up by a card whose effect untapped Greg's card. This went on for the rest of the day.

About a week later I asked Aaron Forsythe to take the first stab at doing the gears (I coined the term as the cards interlinked to work together). Here is what we got back:

GOLDBERG

These were extremely difficult. It took me over two hours to nail these six cards down, and they're still a little scary. It all sounded so simple when Mark pitched "T: Target creature gets +1/+1 until end of turn. Whenever a creature comes into play, you may untap CARDNAME." The real difficulty of the project came to bear when Greg submitted his attempt, one of which played off of Mark's original concept with a trigger of "When a creature's toughness increases..." and Mark said the trigger wouldn't work!

So here is my go at it. Six artifacts, costed 1 to 6. When the whole thing gets going, the guaranteed kill is 20 to the head by throwing land at your opponent. The alt-win is by making a 20+ power trampler, if you started the loop with a creature in play. The third option is setting up the "perfect hand."

It has a "cool machine feel" because it can take the same land and destroy it and recycle it infinitely.

Originally these were all 2 mana to play, and seemed so easy to break that I added mana activation costs to most of them, and the additional text of "All other Gears' activated abilities cost 1 less to play." It was clunkier but safer. A card that cost 5,T to activate would be reduced to just T when all the pieces were in line. But that was a lot of extra clunky text, so I just made some of them cost more and hopefully that will be enough.

I left off milling and shuffling, as those make inelegant triggers (especially shuffling. No combo kill should involve shuffling 20 times).

The gain life trigger SHOULD WORK. After all, there is a creature in Lettuce that gets +1/+1 counters "whenever you gain life," and that card doesn't appear to have rules problems.

Best wishes to development with these. They can't randomly kill one, or add mana to the activation, or change one ability without looking at the big--and impractical--picture.

Have a look...

Reinforcing Gear

6

Artifact – Gear

T: Put a 2/2 green Bear creature token into play.

Whenever you discard a card, you may untap CARDNAME.

Jalum Gear

5

Artifact – Gear

T: Draw a card, then choose and discard a card.

Whenever a land comes into play, you may untap CARDNAME.

Harvester Gear

4

Artifact – Gear

T, Sacrifice a land: CARDNAME deals 1 damage to target player.

Whenever a creature comes into play, you may untap CARDNAME.

Ecological Gear

3

Artifact – Gear

T: Gain 1 life.

Whenever a land goes to a graveyard from play, you may untap CARDNAME.

Worldbuilder Gear

2

Artifact – Gear

T: Put target land card from your graveyard into play tapped.

Whenever a creature goes to the graveyard from play, you may untap CARDNAME.

Infuser Gear

1

Artifact – Gear

T, sacrifice a creature: Target creature gets +2/+0 and trample until end of turn.

Whenever you gain life, you may untap CARDNAME.

--aaron

I then massaged the cards a little. Here are the cards as we handed them over from design:

UA22

Infuser Gear

o1

ArtifactGear

T, sacrifice an artifact: Target player gains life equal to the converted mana cost of the sacrificed artifact. Whenever an artifact comes into play, you may untap CARDNAME.

I changed the infuser gear as I found the gain life trigger very awkward. I changed it to trigger off artifacts coming into play. But I still wanted infinite life to be part of the combo, so I made life gain part of the effect. I changed the activation from sacrifice a creature to sacrifice an artifact so that this artifact could sacrifice itself as part of the chain.

UA23

Worldbuilder Gear

o2

ArtifactGear

T: You may put a basic land card from your graveyard or your hand into play tapped. Whenever an artifact goes to the graveyard from play, you may untap CARDNAME.

To make the ability a little more useful, I added a related second ability (the ability to put land from your hand into play). As part of the effect juggling I changed the trigger from a creature

going to the graveyard to an artifact.

UA24

Harvester Gear

o3

ArtifactGear

T, Sacrifice a land: CARDNAME deals 1 damage to target creature or player. Whenever a land comes into play, you may untap CARDNAME.

I dropped this from 4 to 3. In addition I changed the trigger to lands coming into play rather than creatures.

RA14

Phyrexian Gear

o4

ArtifactGear

T, Sacrifice a creature: Target player draws a card. Whenever a creature comes into play, you may untap CARDNAME.

I changed this from the Jalum Gear as the discard trigger also proved awkward. (Notice in its place I used lands coming into play and leaving play – permanents coming and going worked better as triggers.) I used the creature coming into play trigger because it blended nicely with the sacrifice cost. Essentially, each time you played a creature, the Phyrexian Gear (named after *Mirage's* **Phyrexian Vault**) was ready to sacrifice it for a card.

RA15

Cog Gear

o5

ArtifactGear

T: Put a non-creature artifact card with a converted mana cost of 1 or less from your graveyard into play. Whenever a creature goes to a graveyard from play, you may untap CARDNAME.

By putting Ecological Gear's life gaining into Infuser Gear, I freed up a space to make a new gear. A cog-helper seemed perfect and allowed us to connect the gears to the cogs.

RA16

Reinforcing Gear

o6

ArtifactGear

T: Put a 2/2 green Bear creature token into play. Whenever a land goes to a graveyard from play, you may untap CARDNAME.

As I got rid of the discard trigger, this turned into a land leaving play trigger.

And thus were the gears handed off to development.

It's a Cog's Life

I've shown you how all the cards left design. And you all know what saw print, so this begs the question, what the hell happened in development? Well, I'd be happy to tell you except I'm the design column. What does that mean?

TO BE CONTINUED THIS FRIDAY IN "LATEST DEVELOPMENTS"

Yes, magicthegathering.com's first cross-over column (hey, it works for every other media). What happened to the cogs and gears in development? Check in with Aaron Forsythe this Friday to find out.

Then join me next week when I talk about another popular *Fifth Dawn* theme – breaking the rules.



Until then, may you be inspired by popular culture.

Mark Rosewater

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